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Determinants of children's education in Vietnam: Evidence from the 2014 Intercensal Population and Housing Survey

Nguyen Viet Cuong

Abstract

This study investigates several determinants of children's education in Vietnam. It finds an important role of living with both parents on. More specifically, children in households without either parent, due to divorce or death of parents, have lower enrollment rates than other children. Importantly, the effect on children of divorce of parents is even higher than the effect of parental death. Children with parents who migrate also have lower enrollment rates compared to children living in households where parents do not migrate. The study also shows correlation between inter-ethnic marriage and children's education. Children in families in which one Kinh parent and one from an ethnic minority group, as well as children of parents from two different ethnic minorities, have higher school attendance rates than children with parents from the same ethnic minority group.

JEL classification: I1, I2, O1.

Keywords: Children, Young, Education, Vietnam.

1. Introduction

Education is one of the most important development goals of countries around the world, partly because of the role of education in increasing economic productivity (Psacharopoulos and Partinos, 2004; Schultz, 1997, 2002). Viet Nam has achieved the Millennium Development Goal of providing universal primary education and increasing the enrolment rate for lower-secondary and upper-secondary education (MPI, 2013). There are no differences in educational attainment between boys and girls. However, there are still gaps in higher education levels between urban and rural children, and between poor and rich households.

There are a large number of studies on education in Vietnam (e.g., Anh et al., 1998; Glewwe, 2004; Dang, 2007; Mont and Nguyen, 2013; Nguyen, 2016). In most studies, education and school enrolments are found to be strongly correlated with education of parents, income levels, household composition, geography and ethnicity. This study aims to examine social-economic factors that are correlated with education of children in Vietnam.

Compared with previous studies, there are two new points. Firstly, this study used updated and large data sets from the 2014 Intercensal Population and Housing Survey. In 2014, Viet Nam's General Statistics Office (GSO) conducted the Intercensal Population and Housing Survey (IPS 2014). The 2014 IPS was a sample survey with a sample size of 5% of the total households in Viet Nam (1,121,850 households). The objective of this midterm census is to provide estimates of the size, structure and distribution of the population, as well as economic and social features at the provincial and district level. The data set contains information on demography and education of individuals.

Secondly, in addition to the key determinants of education that are often studied in the previous studies, we will examine the role of both parents in caring for children. Most researchers agree that having a single parent, whether due to divorce, death or widowhood, tends to have a negative impact on the development of children (e.g., Amato and Keith, 1991; Haveman and Wolfe, 1995; Gruber, 2004; Kim, 2011). Absence of parents due to migration also has an impact on children. Theoretically, parental absence due to migration can have a positive or a negative effect on school attendance of children. On the one hand, parental migration contributes to household income, but on the other hand it can have a negative impact on children because children receive less care from parents (Antman, 2010 and 2012).

The remaining paper is structured as follows. The second section describes the descriptive statistics of education of children in Vietnam using data from the 2014 IPS. The third and fourth sections present the regression method and empirical results of determinants of children's education, respectively. Finally, the fifth section concludes.

2. Education of children and youth

In terms of literacy and welfare, there is a large gap between children from different welfare quintiles. The illiteracy rate of children and the youth in the lowest quintile for living standards was 4.5% and 9.8%, respectively, which are remarkably higher than that rate for children and youth in the highest quintiles.¹

¹ In the 2014 IPS, the living conditions index can be used to reflect the level of welfare of households instead of income or consumption. For large-scale surveys such as the 2014 IPS, the authors could not collect expenditure or income data because of the high cost. According to Filmer and Scott (2008), and Kolenikov et al. (2009), the living conditions index is closely correlated with other variables of the household family such as income, spending, education and health care. Living condition is measured by an aggregate index which is constructed using housing conditions and durables owned by households. According to this index, people and households are divided into five quintiles based on their values in this index.

Table 1. Illiteracy rate of children and youth, Viet Nam, 2014

Group	The illiteracy rate of children 7-15 (%)	The illiteracy rate of youth 16-30 (%)
<i>Gender</i>		
Female	1.5	2.7
Male	1.6	2.1
<i>Urban/rural</i>		
Rural	1.9	3.1
Urban	0.9	1.0
<i>Living standard level</i>		
Lowest	4.5	9.8
Below middle	1.5	2.1
Middle	1.0	1.1
Above middle	0.7	0.7
Highest	0.5	0.3
All	1.6	2.4

Table 2 presents the enrolment rate and education completion rate of children and youth. Nearly 50% of children aged 3-6 in Viet Nam were enrolled in kindergartens in 2014. It should be noted that the 2014 IPS was conducted in April 2014, and so children who had reached the age of six were not enrolled in primary school yet (the school year starts from September in Viet Nam). The school enrollment rate for children and youth aged 7 to 15 was approximately 94%. The difference in enrollment rates between boys and girls, as well as between urban and rural areas, was negligible. However, children in the group of low living conditions had lower enrollment rates than children in the high living conditions groups.

Enrollment rates for youth ages 16 to 23 (in upper-secondary schools, colleges and universities) was around 32.8% in 2014. Table 2 also shows the percentage of young people with high education levels. In general, women had higher enrollment rates and completion rates than men. This implies that there is no gender discrimination in education at schools or colleges. However, inequality in education between groups with different living conditions is very high. For example, in the group with low living

conditions only about 2% of young people aged 24-30 had graduated from college or university, while this percentage in the group with high living conditions was 46%. Even the upper-secondary completion rate is also very different between groups with different living conditions. The proportion of young people who have completed upper-secondary school in the group with low living conditions was only about 16%, while this rate in the group with high living conditions was 83%.

Table 2. Enrolment and completion rates by education level, Viet Nam, 2014

Group	Enrolment rate, age 3-6 (%)	Enrolment rate, age 7-15 (%)	Enrolment rate, age 16-23 (%)	Completion of upper secondary school, age 24-30 (%)	Completion of college, university, age 24-30 (%)
<i>Gender</i>					
Female	48.6	93.9	34.4	48.3	20.0
Male	48.8	93.0	31.3	47.5	17.1
<i>Urban/rural</i>					
Rural	48.0	92.5	27.1	39.2	11.7
Urban	50.3	95.6	44.9	64.2	31.4
<i>Living standard level</i>					
Lowest	45.1	85.5	14.9	16.3	2.2
Below middle	48.1	91.4	23.6	29.7	5.7
Middle	48.0	94.3	27.7	38.0	9.0
Above middle	49.5	96.6	39.1	55.7	19.0
Highest	51.7	98.3	54.3	82.9	46.3
All	48.7	93.5	32.8	47.9	18.5

3. Regression methods

Association between two variables does not mean causality. For example, the school enrollment rate in urban areas is higher than in rural areas. This can be because the access to school and education is better in urban areas. Another reason might be that urban households have higher incomes than rural households. To understand the factors affecting the welfare of individuals, regression analysis was used. Regression analysis provides an understanding of the effect of one explanatory variable on a dependent variable after controlling for other explanatory variables.

In this study, the logistic regression model was used, which is applied to binary variables (Green, 2011). The model is as follows:

$$P(y_{i,j} = 1|X) = F(\beta_0 + INDIVIDUAL_{i,j}\beta_1 + HEAD_j\beta_2 + HOUSEHOLD_j\beta_3), \quad (1)$$

where $y_{i,j}$ is a dummy variable, for example, school enrolment of individual i in household j . $INDIVIDUAL_{i,j}$ is the vector of individual characteristics, $HEAD_j$ represents characteristics of the household head such as age and sex, $HOUSEHOLD_j$ represents variables of households such as household size and proportion of children and elderly in households, and ε_j is unobserved variables.

The logistic function is as follows:

$$P(y_{i,j} = 1|X) = F(X\beta) = \frac{e^{X\beta}}{1+e^{X\beta}}, \quad (2)$$

where $X\beta$ denote $\beta_0 + INDIVIDUAL_{i,j}\beta_1 + HEAD_j\beta_2 + HOUSEHOLD_j\beta_3$.

Since the logistic function is non-linear, the coefficient of explanatory variables in the logistic function does not have clear economic meaning. To interpret the meaning of the coefficient, the marginal effect of explanatory variables was computed as follows:

$$MF_X = \frac{\partial P(y_{i,j}=1|X)}{\partial X} = \frac{\partial F(X\beta)}{\partial X} \beta = \frac{e^{X\beta}}{1+e^{X\beta}} \left(1 - \frac{e^{X\beta}}{1+e^{X\beta}}\right) \beta \quad (3)$$

Marginal effects change across the values of X . Thus, the marginal effect at the mean of X was computed as:

$$\widehat{MF_X} = \frac{e^{\bar{X}\hat{\beta}}}{1+e^{\bar{X}\hat{\beta}}} \left(1 - \frac{e^{\bar{X}\hat{\beta}}}{1+e^{\bar{X}\hat{\beta}}}\right) \hat{\beta}, \quad (4)$$

where \bar{X} is the mean of X , and $\hat{\beta}$ is the estimates of β in the model (1). The marginal effect is explained as follows: if X changes by ΔX , y will change by $\overline{MF_X} \Delta X$. In this report, the marginal effects are presented.

It should be noted that a key assumption of the regression model is that the explanatory variables are not correlated with unobserved variables. Measuring the causal impact of an explanatory variable such as parental education on children's school attendance is a major challenge. The ability and/or health of parents can influence their own education, and can also affect their children through channels other than education. In the regression model variables like intelligence or health are often not measured and included in the model. The estimation of education will be biased. To be able to explain the causal impact of explanatory variables on outcome variables, the explanatory variables must be exogenous. This is a strong assumption, and therefore the explanation of the regression used here is careful when talking about causal effects. The regression coefficient of an explanatory variable can be interpreted as a correlation between the explanatory variable and the outcome variable after controlling for other explanatory variables in the model.

4. Empirical results

To understand the factors that affect student attendance, regression analysis was conducted for education variables on the explanatory variables. Table 3 presents the results of the regression analysis of school enrolment on characteristics of student and their families. We also conducted regression analysis of literacy, but those results are presented in the Appendix. In this section the focus is on presenting the results of the regression analysis of schooling variables.

Parents play a key role in children's school attendance. In order to analyze in detail the influence of parents, the analysis focused on children who live with at least one parent in the household. Households in which grandparents are heads were excluded. Although grandparents may live with their children and grandchildren, due to the limitations of the questionnaire it was not possible to identify the relationship between parents and children in the family in which grandparents are household heads.

Results of regression analysis show that boys and young men have lower enrollment rates than girls and young women. For children in kindergarten, older children have higher enrollment rates than younger children. However, at higher education levels, the greater the age the lower the enrollment rate. Also, the percentage of children attending preschool is higher in migrant families than in non-migrant ones. However, the enrollment rates at higher education levels of children in migrant families were lower than in non-migrant families.²

Enrollment rates in different age groups vary widely among ethnic minority groups. The ethnic groups with a population of over 1 million, such as the Tay, Thai, Muong, Khmer, and Hmong, are considered separately, while smaller minorities are grouped into the category of 'other ethnic minorities'. The analysis shows that children of Tay, Thai and Muong have higher enrollment rates than other ethnic groups, even more than Kinh. This reflects an increasing priority placed on children's education among ethnic minorities. It should be noted that the descriptive statistics indicate that the proportion of Kinh children going to school is higher than children in ethnic minorities. However, descriptive statistics do not control for other factors such as the education level of parents and geographic locations that affect children's education. In

² In this monograph, migration is defined as a change of residence within the past 5 years.

the regression model, after controlling for the differences in these factors between Kinh and ethnic minorities, Kinh children do not have higher school enrolment rates than ethnic minority children.

Mong children have the lowest enrollment rates, while the enrollment rates for Kinh, Tay and Nung youth aged 16 and over is higher than for other ethnic groups. The enrolment rate of Muong and Khmer children is lower than children of other ethnic groups.

The enrollment rate for youth aged 16-24 who have a mother as the family head is higher than those who with a father as the family head, by 2.8 percentage points. This may indicate that mothers place a higher priority on their children's education than fathers. Since some children do not live with both parents (because parents work outside the home, or parental divorce or death), the analysis was only able to control for age and educational level of the parent with higher education qualifications. The age of parents affect their children's school attendance. Age and age-squared variables are statistically significant in models of children's schooling. It implies an inverted U-shaped relationship between parental age and children's schooling. The probability of children attending school increases with the age of the parents, but this peaks at a certain age of the parents (at 47 years in the regression of school attendance of children 3-6 years old, and at 45 years in the regression of school attendance of children aged 7- 15), and then the probability of attending school decreases with parental age.³

The reason for this is that the age of parents reflects income and the experiences of parents. Higher age generally correlates with higher income and more experiences,

³ This is the age at which the marginal impact of age on the probability of attending school is equal to 0. This is calculated by the coefficient of age divided by 2 times the absolute value of the variable age-squared coefficient. Specifically $47=0,01923/(2*0.00021)$ and $45=0,0018 / (2*0.00002)$.

which have a positive impact on children's school attendance. Age and income have an inverted U-shaped relationship, i.e. income increases with age, but only to a certain age, and then falls due to decreasing health and labor productivity of adults at older ages (Deaton, 1986; 2005).

Children of parents with higher education levels tend to have a higher rate of school enrolment. The impact of parental education on school enrolment of young people is highest for youth aged 16-23. The school enrollment rate of youth in Viet Nam is remarkably lower than that than the rate for children. In this context, parental education is especially important for the education of youth. For example, children aged 7-15 whose parents attended college or university have about a 3% higher enrollment rate than children of parents with no education. For youth aged 16-23, the effect of having parents with college or university education is even greater, resulting in a difference in up to 55% in school enrollment. Having parents with college or university education increases the probability of their children obtaining a college and university degree by 67%.

For this study, we analyzed the role of both parents in caring for children. Most researchers agree that having a single parent, whether due to divorce, death or widowhood, tends to have a negative impact on the development of children (e.g., Amato and Keith, 1991; Haveman and Wolfe, 1995; Gruber, 2004; Kim, 2011). Absence of parents due to migration also has an impact on children. Theoretically, parental absence due to migration can have a positive or a negative effect on school attendance of children. On the one hand, parental migration contributes to household income, but on the other hand it can have a negative impact on children because children receive less care from parents (Antman, 2010 and 2012). Table 3 indicates that

children in households without either parent, due to divorce or death of parents, have lower enrollment rates than other children. The effect is higher on youth. For youth aged 16-23, having a single parent because of divorce reduces the enrollment rate by 8.2%, and having a single parent due to death reduces the enrollment rate by 7.6%. Notably, the effect on children of divorce of parents is even higher than the effect of parental death.

Children with parents who migrate also have lower enrollment rates compared to children living in households where parents do not migrate. Marriage between ethnic groups may also affect children through exchange of cultural norms between parents and biological factors (e.g. Furtado, 2009; 2012). Analysis shows that children in families in which one Kinh parent and one from an ethnic minority group, as well as children of parents from two different ethnic minorities, have higher school attendance rates than children with parents from the same ethnic minority group. This implies that different ethnic groups have different knowledge about children's education, and inter-ethnic marriage can contribute to increasing knowledge and interest in children's education.

Table 3. Logistic regression of school enrolment

Explanatory variables	School enrollment (Age 3-6) (Yes=1, No=0)		School enrollment (Age 7-15) (Yes=1, No=0)		School enrollment (Age 16-23) (Yes=1, No=0)	
	Marginal effect	Standard error	Marginal effect	Standard error	Marginal effect	Standard error
Male (male=1, female=0)	0.00049	0.01027	-0.00609***	0.00062	-0.10434***	0.00356
Age	1.41702***	0.02474	-0.01111***	0.00023	-0.11631***	0.00101
Religion (yes=1, no=0)	0.05302***	0.01583	-0.00048	0.00106	-0.01989***	0.00583
Migration during past 5 years (yes=1, no=0)	0.07642**	0.03780	-0.03252***	0.00645	-0.08427***	0.01182
Other ethnic minorities	Reference					
Kinh	0.02222	0.04549	0.02085***	0.00341	0.02832*	0.01614
Tày	0.09152***	0.03319	0.01055***	0.00183	0.03552**	0.01603
Thái	0.14600***	0.03808	0.01007***	0.00189	0.00680	0.01821
Mường	0.14731***	0.03089	0.00920***	0.00204	-0.04959***	0.01594
Khmer	-0.04736	0.04892	0.00368	0.00245	-0.04421**	0.02159
Nùng	0.06395	0.05102	0.01050***	0.00176	0.04171**	0.01711
Mông	-0.11905***	0.04503	-0.01041***	0.00353	0.02644	0.02663
Household head (father=1, mother=0)	0.01046	0.01758	-0.00167	0.00109	-0.02982***	0.00678
Parental age	0.01923***	0.00610	0.00180***	0.00047	0.00154	0.00311
Parental age squared	-0.00021***	0.00008	-0.00002***	0.00001	-0.00003	0.00003
Parents with education degree	Reference					
Parents with primary degree	0.13959***	0.01624	0.01678***	0.00078	0.14652***	0.00631
Parents with lower-secondary degree	0.20193***	0.01628	0.02561***	0.00098	0.26174***	0.00674
Parents with upper-secondary degree	0.22032***	0.01773	0.02750***	0.00090	0.42372***	0.00770
Parents with college, university	0.20519***	0.02161	0.02701***	0.00092	0.55442***	0.00756
Live with both parents	Reference					
One of parents migrate	-0.02129	0.05705	-0.01526***	0.00521	-0.02937	0.01846
One of parents dead	-0.01622	0.05566	-0.02301***	0.00358	-0.07574***	0.01232
Divorced or separated parents	-0.01118	0.05484	-0.02967***	0.00502	-0.08187***	0.01369
Parents of the same ethnic group	Reference					
One of parents is ethnic minorities and another is Kinh	-0.02486	0.03216	0.00506***	0.00190	0.06290***	0.01635
Parents are both Kinh	0.04954	0.04387	0.00181	0.00215	0.04856***	0.01319
Parents are of different ethnic minorities	0.04176	0.04192	0.00645**	0.00280	-0.00089	0.02162
Urban (urban=1, rural=0)	-0.02107	0.01539	0.00295**	0.00117	0.12205***	0.00606
Northern Midlands and Mountains	Reference					
Red River Delta	-0.01877	0.01921	0.00574***	0.00160	0.08999***	0.00973
North and South Central Coast	-0.08371***	0.01866	-0.00362**	0.00167	0.04200***	0.00817
Central Highlands	-0.12794***	0.02399	-0.00725***	0.00226	-0.01881*	0.00963
Southeast	-0.16098***	0.02199	-0.01376***	0.00275	0.08200***	0.01084
Mekong River Delta	-0.27806***	0.01713	-0.03460***	0.00340	-0.01080	0.00835
Household size	-0.03105***	0.00619	-0.00387***	0.00028	-0.02610***	0.00173
Proportion of children	0.07374	0.05715	0.00333	0.00269	0.02104	0.01489
Proportion of elderly	0.28683***	0.10762	0.02336***	0.00534	0.08873***	0.02370
Observations	59,032		158,256		131,677	
R-squared	0.809		0.244		0.286	

Note: Age and education level of parents are age and education levels of the parent (father or mother) with the highest education level. If there is a single parent, the education and age of parents is the education and age of this single parent.

Note: *** statistically significant at 1%; ** at 5%; and * at 1%.

There is an influential view that children in large families receive less investment from parents than those from small families (Becker 1960; Becker and Lewis 1973; Becker and Tomes 1976). Our analysis shows that children in large families have a lower enrollment rate than children in smaller sized families. An additional household member reduces the enrolment rate of children aged 3-6 by around 3.1%, for children aged 7-15 the impact is 0.4%, and for youth aged 16-23 enrollment is reduced by 2.6%. The proportion of children in households does not affect enrollment rates of children. However, a higher proportion of elderly family members improves the schooling rate of children, possibly because the elderly can also support children's education.

The percentage of children in school varies across regions and rural/urban areas. Children and youth in the Red River Delta and Northern Midlands and Mountains have higher enrollment rates than those in the central and southern regions. Children and youth in urban areas have higher enrollment rates than those in rural areas.

Table 4 presents the regression analysis of upper-secondary (high school) graduation and college/university degrees among youth in the age group of 24-30 years. Tay and Kinh have higher rates of upper-secondary and college/university graduation than other ethnic groups. The relationship between parental age and educational levels of children has an inverted U shape. However, the age at the peak of the inverted U-shaped is very high (parental age of 89 for the regression of upper-secondary education and 77 years for the regression of college and university graduation). This implies that parental age has a positive but decreasing effect on the educational level of children.

Table 4. Logistic regression of completion of upper-secondary school and college/university

Explanatory variables	Complete upper-secondary (Yes=1, No=0)		Complete college/university (Yes=1, No=0)	
	Marginal effect	Standard error	Marginal effect	Standard error
Male (male=1, female=0)	-0.11449***	0.00575	-0.10214***	0.00449
Age	-0.00646***	0.00127	-0.00384***	0.00090
Religion (yes=1, no=0)	-0.05337***	0.00822	-0.01485***	0.00509
Migrated in the past 5 years (yes=1, no=0)	0.12313***	0.01217	0.15378***	0.01145
Other ethnic minorities	Reference			
Kinh	0.09951***	0.02068	0.03989***	0.01389
Tày	0.10189***	0.02147	0.02439	0.01814
Thái	0.05233*	0.02718	-0.01027	0.02233
Mường	-0.02573	0.02844	-0.03025*	0.01768
Khmer	-0.03313	0.03195	0.02730	0.02670
Nùng	0.03895	0.02644	0.01100	0.02242
Mông	-0.08314	0.05459	-0.04246	0.03490
Household head (father=1, mother=0)	-0.08098***	0.00866	-0.05013***	0.00621
Parental age	0.00897**	0.00444	0.00771**	0.00309
Parental age squared	-0.00005	0.00004	-0.00005*	0.00003
Parents with education degree	Reference			
Parents with primary degree	0.15943***	0.00729	0.09441***	0.00791
Parents with lower-secondary degree	0.33289***	0.00682	0.19846***	0.00886
Parents with upper-secondary degree	0.44887***	0.00491	0.41057***	0.01158
Parents with college, university	0.45853***	0.00395	0.67095***	0.01016
Live with both parents	Reference			
One of parents migrate	-0.03728	0.02662	-0.01292	0.01898
One of parents dead	-0.09943***	0.01996	-0.03053**	0.01290
Divorced or separate parents	-0.13743***	0.02466	-0.04970***	0.01357
Parents of the same ethnic group	Reference			
One of parents is ethnic minorities and another is Kinh	0.06641***	0.02203	0.03699**	0.01811
Parents are both Kinh	0.03226*	0.01930	0.04505***	0.01327
Parents are of different ethnic minorities	0.01108	0.03487	0.01361	0.02739
Urban (urban=1, rural=0)	0.12236***	0.00735	0.08588***	0.00497
Northern Midlands and Mountains	Reference			
Red River Delta	0.04764***	0.01252	0.03717***	0.00829
North and South Central Coast	-0.03957***	0.01237	0.00845	0.00766
Central Highlands	-0.09695***	0.01680	0.01192	0.01050
Southeast	-0.08630***	0.01381	-0.00090	0.00844
Mekong River Delta	-0.19091***	0.01218	-0.03831***	0.00718
Household size	-0.00636***	0.00221	-0.00532***	0.00141
Proportion of children	-0.40361***	0.02461	-0.27241***	0.01737
Proportion of elderly	-0.02518	0.02259	-0.01847	0.01503
Observations	69690		69690	
R-squared	0.224		0.213	

Note: Age and education level of parents are age and education level of the parent (father or mother) with the highest education level. If there is a single parent, the education and age of parents is the education and age of this single parent.

Note: *** statistically significant at 1%; ** at 5%; and * at 1%.

The variables of education, marriage and migration of parents have similar effects as the regression models of school enrolment. Single parents or low education parents have a negative impact on the education of children. In Table 4 migration has a positive sign, suggesting that migrants tend to have higher education. The reason may be that people move to cities to obtain high education levels or migrants tend to migrate to cities if they have high educational attainment.

5. Conclusions

This study investigates social-economic factors that are correlated with education of children in Vietnam. It finds an inverted U-shaped relationship between parental age and children's schooling. The probability of children attending school increases with the age of the parents, but this peaks at a certain age of the parents, and then the probability of attending school decreases with parental age.

Children of parents with higher education levels tend to have a higher rate of school enrolment. We also find that children in households without either parent, due to divorce or death of parents, have lower enrollment rates than other children. Notably, the effect on children of divorce of parents is even higher than the effect of parental death. Children with parents who migrate also have lower enrollment rates compared to children living in households where parents do not migrate. Analysis shows that children in families in which one Kinh parent and one from an ethnic minority group, as well as children of parents from two different ethnic minorities, have higher school attendance rates than children with parents from the same ethnic minority group. This implies that different ethnic groups have different knowledge about children's education, and inter-ethnic marriage can contribute to increasing knowledge and interest in children's education.

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Appendix

Table A.11. Explanatory variables used in regressions

Explanatory variables	Type	Mean	Standard deviation	Min	Max
<i>Individual-level variables</i>					
Male (male=1, female=0)	Binary	0.4927	0.4999	0	1
Age	Discrete	32.225	20.798	0	110
Religion (yes=1, no=0)	Binary	0.1741	0.3792	0	1
Migrated in the past 5 years (yes=1, no=0)	Binary	0.0661	0.2485	0	1
Kinh	Binary	0.8571	0.3499	0	1
Tày	Binary	0.0200	0.1399	0	1
Thái	Binary	0.0181	0.1335	0	1
Mường	Binary	0.0150	0.1214	0	1
Khmer	Binary	0.0134	0.1150	0	1
Nùng	Binary	0.0113	0.1059	0	1
Mông	Binary	0.0137	0.1164	0	1
Other ethnic minorities	Binary	0.0513	0.2206	0	1
Have no education degree	Binary	0.3131	0.4638	0	1
Have primary degree	Binary	0.2302	0.4209	0	1
Have lower-secondary degree	Binary	0.2294	0.4205	0	1
Have upper-secondary degree	Binary	0.1544	0.3613	0	1
Have college, university	Binary	0.0729	0.2600	0	1
Urban (urban=1, rural=0)	Binary	0.3284	0.4696	0	1
Northern Midlands and Mountains	Binary	0.1286	0.3347	0	1
Red River Delta	Binary	0.2282	0.4197	0	1
North and South Central Coast	Binary	0.2153	0.4110	0	1
Central Highlands	Binary	0.0608	0.2390	0	1
Southeast	Binary	0.1737	0.3789	0	1
Mekong River Delta	Binary	0.1934	0.3950	0	1
Gender household head (male=1, female=0)	Binary	0.7629	0.4253	0	1
Age of household heads	Discrete	49.104	14.268	15	108
Household head have no education degree	Binary	0.2122	0.4089	0	1
Household head have primary degree	Binary	0.2634	0.4405	0	1
Household head have lower-secondary	Binary	0.2849	0.4514	0	1
Household head have upper-secondary	Binary	0.1622	0.3686	0	1
Household head have college, university	Binary	0.0774	0.2672	0	1
Household head married	Binary	0.8365	0.3698	0	1
Household head widowed	Binary	0.1147	0.3187	0	1
Household head divorced/separated	Binary	0.0209	0.1430	0	1
Household size	Discrete	4.4377	1.7578	1	33
Proportion of children	Continuous	0.2536	0.2039	0	1
Proportion of elderly	Continuous	0.1053	0.2132	0	1
Observations		1342072			
<i>Variables of Parents</i>					
One of parents migrated	Binary	0.0222	0.1473	0	1
One of parents dead	Binary	0.1010	0.3013	0	1
Divorced or separated parents	Binary	0.0254	0.1573	0	1
Parents of the same ethnic group	Binary	0.1270	0.3330	0	1
Parents are Kinh and ethnic minorities	Binary	0.0210	0.1434	0	1
Parents are both Kinh	Binary	0.7036	0.4567	0	1
Parents are of different ethnic minorities	Binary	0.0059	0.0764	0	1
Observations		504177			

Table A.2. Logistic regression of illiteracy of children and youth, Viet Nam, 2014

Explanatory variables	Illiterate (Age 7-15) (Illiterate =1, Literate=0)		Illiterate (Age 16-30) (Illiterate =1, Literate=0)	
	Marginal effect	Standard error	Marginal effect	Standard error
Male (male=1, female=0)	0.00115***	0.00043	-0.00305***	0.00042
Age	-0.01453***	0.00073	0.00161***	0.00039
Age squared	0.00063***	0.00003	-0.00002**	0.00001
Religion (yes=1, no=0)	-0.00156**	0.00074	0.00164**	0.00073
Migrated in the past 5 years (yes=1, no=0)	0.00411**	0.00185	-0.00484***	0.00055
Other ethnic minorities	Reference			
Kinh	-0.02546***	0.00281	-0.05162***	0.00349
Tày	-0.00588***	0.00069	-0.01065***	0.00039
Thái	-0.00452***	0.00088	-0.00282***	0.00103
Mường	-0.00805***	0.00063	-0.01041***	0.00042
Khmer	-0.00476***	0.00104	-0.00373***	0.00099
Nùng	-0.00704***	0.00061	-0.00868***	0.00061
Mông	0.01826***	0.00372	0.03131***	0.00479
Urban (urban=1, rural=0)	-0.00217***	0.00064	-0.00407***	0.00059
Northern Midlands and Mountains	Reference			
Red River Delta	-0.00185*	0.00104	-0.00908***	0.00072
North and South Central Coast	0.00278**	0.00114	-0.00230**	0.00101
Central Highlands	0.00743***	0.00199	-0.00124	0.00121
Southeast	0.00187	0.00150	-0.00367***	0.00098
Mekong River Delta	0.01063***	0.00200	0.00593***	0.00143
Household size	0.00123***	0.00013	0.00042***	0.00009
Proportion of children	0.00935***	0.00180	0.01405***	0.00114
Proportion of elderly	0.00244	0.00225	0.00806***	0.00136
Observations	190,387		332,757	
R-squared	0.124		0.206	

Note: *** statistically significant at 1%; ** at 5%; and * at 1%