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# **Explaining children's leisure in Vietnam**

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## **Abbreviations**

UN            United Nations

OLS           Ordinary Least Squares

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The effect of child labour on children's development and education has been receiving international attention due to the extensive involvement of children in work-related activities. According to a UN report (De La Paz 1990), there are 145 million children under 15 years of age who are economically active and essentially working full time either as unpaid family workers or as wage earners. Of these children, 98 per cent live in developing countries (Shah 1987). Furthermore, estimates from the International Labour Office (De La Paz 1990) suggest that 38.1 million such children are in East and Southeast Asian countries. Our estimates, based on the Vietnam Living Standards Survey 1992–93, suggest that 31 per cent of Vietnamese children between 5 and 15 years old are involved in work activities, both paid and unpaid.

The survey shows that Vietnamese children between 5–15 years participate in a wide range of economic activities. They contribute 11 per cent of all work hours and 18 per cent of all housework hours to the economy. In a household, they contribute approximately half the work hours and more than 60 per cent of the housework hours of the mother. These are significant contributions.

What are the implications of this contribution on children's leisure? Which children have more leisure and which have less? Children's leisure deserves more attention in its own right, because leisure is an important ingredient for the healthy development of children. Most time-use studies focus on the leisure of married women. Research on children (Grootaert and Kanbur 1995a; Grootaert and Kanbur 1995b; Kanbargi 1991) focuses narrowly on the issue of a single activity, namely, child labour. This paper goes beyond most previous studies in this genre by focusing on the leisure time of children. This approach allows for the possibility of children participating in different combinations of activities.

The study yielded several results.

- The number of activities in which children participate expands with age.
- As children grow older, a trade-off between the time they spend in class and in other economic activities, work-related activities in particular, becomes obvious.
- This trade-off reflects a negative relationship between leisure and the age of children. In particular, the time use competitiveness of school children is more intense.
- The direct implication drawn from the previous result is that the expansion of children's effort—that of school children in particular—into more activities as they grow older does not merely imply a reshuffling of their time among activities, it reduces their leisure. The reduction of leisure comes mainly from the increase in work hours as they grow older.
- Gender differences are evident. Girls have less leisure time than boys, foreshadowing their disadvantaged position within the family in their adulthood. Women's double burden can therefore be traced back to childhood.
- There are significant differences between regions. Children from the North enjoy less leisure than their peers in the South.

## Theoretical considerations

Since the pioneering model by Becker (1965), time has been widely viewed as an important input of economic activities. Gronau (1977), Gronau and Tomes (1976), Becker (1981) and Wales and Woodland (1977) studied intrafamily time allocation, focusing on married women and their decisions to allocate time to market work, nonmarket work, and leisure.

Consider a simple model in which each household consists of a father (f), a mother (m), and a child (c), and each household seeks to maximise the 'composite utility function', which can be written in the form of Equation 1, subject to time and budget constraints.

$$(1) \quad \max \quad U(x, t_h^f, t_l^f, t_h^m, t_l^m, t_h^c, t_l^c, t_s^c)$$

where  $x$  is the composite commodity purchased from the market

$t_h^i$  is the time allocated to home production

$t_l^i$  is the time allocated to leisure

$t_s^c$  is children's time allocated to schooling

and  $i=f, m, c$ .

(2) Time constraint

$$T = t_l^i + t_h^i + t_m^i \quad i=f, m$$

$$T = t_l^c + t_h^c + t_m^c + t_s^c$$

$$t_h^i, t_l^i, t_m^i > 0 \quad i=f, m, c$$

$$t_s^c > 0$$

(3) Budget constraint

$$px + \sum_{i=f,m} w_m^i (t_l^i + t_h^i) + w_m^c (t_l^c + t_h^c + t_s^c) \equiv \sum_{i=f,m,c} w_m^i T + V \equiv F$$

where  $p$  is the price of the market-purchased composite commodity

$w_m^i$  is the wage rate of the father and the mother

$w_m^c$  is the wage rate of the child

$V$  is non-labour income

$F$  is full income

The reduced form of the child-related time allocation could be written as

$$(4) \quad t_j^c = \gamma(w_m^i, p, V)$$

where  $i$  indexes father, mother and child; and  $j$  indexes the type of activity, such as work, housework, schooling and leisure. The empirical counterpart of Equation 4 can be specified as

$$(5) \quad t_j^c = \beta_0 + \beta_1 w_m^i + \beta_2 z^i + \varepsilon_j^i$$

$$t_j^c = \begin{cases} t_j^{c*} & \text{if } t_j^{c*} > 0 \\ 0 & \text{otherwise} \end{cases}$$

where  $j$  is defined as above.  $z^i$  is a vector of variables, such as demographic characteristics of the child, parental characteristics, and household specific variables.  $\varepsilon$  is an error term summarising all the unobservable household and individual characteristics, such as differences in ability, work ethic, and other factors which are difficult, if not impossible, to measure.

## Data

### Vietnam Living Standards Survey 1992–93

The data used in this study are drawn from the Vietnam Living Standards Survey conducted by the World Bank and the State Planning Committee of Vietnam in 1992–93. It was a national survey which collected data to measure the effects of economic reforms on households.

A random sample of 4800 households was chosen to reflect the distribution of the population in urban and rural areas. The multipurpose survey collected information on family background and resources available to the households. It gathered data on health, education and training, migration, housing, fertility, income, expenditures, assets, and labour force activity. It also collected data from farm and nonfarm household enterprises. Some information was at the household level and some was at the individual level. In rural areas, the household level information was complemented by a community questionnaire which collected information on public services, transportation, and prices.

The head of household was the preferred respondent to the questionnaire. If he or she was not available, a ‘principle respondent’ answered the questions instead. The ‘principle respondent’ had to be a member of the household who was able to give information on the other household members. A household member is defined as a person who normally lives and eats their meals in the dwelling and has not been away from the household for more than six of the past twelve months. Tenants are not classified as household members. Hired workers and servants are also not classified as household members if their own family lives elsewhere. Visitors who stay for six months or more are classified as household members.

This paper focuses on children from 5–15 years of age—28 per cent of the survey sample.<sup>1</sup> There were 6672 children in the sample within the age group (5–15 years), 3391 males and 3281 females. There were 3222 children (1646 males and 1576 females) from the North and 3450 children (1745 males and 1705 females) from the South. Most of the children in the survey (83 per cent) were from rural areas.

## Children's time use: some stylised facts

Table 1 summarises the distribution of children across different ranges of time use per week in work-related activities (paid and unpaid) and housework. Several points are notable.

- The percentage of children who do not participate in either work or housework falls with age. Less than 10 per cent of 15 year olds did not participate in any activity.
- The proportion of children participating in at least one activity rises, then falls as we move across different age groups within a particular hour range. The lower percentage of children in older age groups may reflect the fact that older children move to higher hour categories.
- The positive relationship between the percentage of children and their age becomes more obvious in higher hour categories.
- Almost 25 per cent of children aged 15 spent at least 40–60 hours per week doing work and housework.

All children who reported their participation status in work, class hours and housework are included in Table 2. It shows that, on average, children tend to spend more time at work and less in classes as they grow older. Since Table 2 includes non-participants, the fall in class hours and the rise in work hours reflects the increasing number of children dropping out of school as they grow older. In addition, housework hours increase at young ages and then stabilise as children reach 12 years old. At 15 years old, children spend 35 hours a week doing work and housework. This is a significant amount of time. Since we do not have the data on leisure, we define leisure as the residual of the sum of work hours, class hours and housework hours. Note that leisure time declines with age. The reduction of children's leisure time comes mostly from the increase in the work hours.

Data also show that gender differences are evident in children's time allocation patterns. Regardless of gender, work hours and housework hours increase and class hours decrease with age (Table 3). On average, however, girls spend much more time doing housework than boys. That boys, on average, spend less time working than girls reflects the fact that more boys stay in

**Table 1 Time children spend in work and housework per week (per cent)**

Age	Zero hours	1–20	21–40	41–60	Over 60
7	83.28	12.67	3.72	0.34	0.00
8	68.90	22.24	8.09	0.78	0.00
9	53.43	31.94	12.54	1.94	0.15
10	35.71	39.46	20.41	3.49	0.94
11	27.80	42.39	20.81	7.45	1.55
12	19.71	37.28	27.60	11.47	3.94
13	17.20	34.41	30.11	12.54	5.73
14	10.82	33.51	25.09	19.93	10.65
15	9.01	24.32	25.23	23.06	18.38

**Table 2 Average hours used per week (including non-participants)**

Age	Work hours	Class hours	Housework	Leisure
7	0.38	18.57	1.16	147.89
8	1.36	16.75	2.85	147.04
9	2.57	16.99	3.50	144.95
10	4.83	17.01	5.03	141.13
11	6.80	16.58	6.57	138.05
12	10.06	15.23	8.01	134.71
13	13.35	12.88	8.65	133.11
14	19.30	9.84	8.96	129.91
15	26.36	6.70	9.11	125.83

**Table 3 Average hours used per week (including non-participants), by gender**

Age	Boys				Girls			
	Work	Class	Housework	Leisure	Work	Class	Housework	Leisure
7	0.46	18.60	1.06	147.88	0.31	16.53	3.42	147.01
8	1.64	16.94	2.36	147.07	1.05	16.53	3.42	147.01
9	2.78	16.99	2.78	145.45	2.35	16.98	4.25	144.42
10	5.56	16.94	4.48	141.01	3.97	17.09	5.67	141.27
11	5.53	17.52	5.39	139.56	7.85	15.81	7.54	136.80
12	9.48	16.95	5.97	135.60	10.59	13.63	9.91	133.87
13	12.71	13.97	6.19	135.13	13.97	11.84	11.02	131.16
14	15.57	12.10	6.80	133.52	22.73	7.76	10.93	126.58
15	23.72	8.36	5.56	130.35	28.93	5.09	12.54	121.44

school than girls when they grow older. As a result, girls enjoy less leisure than boys. If we consider school children only, there is not much gender difference in the work hours. Nonetheless, the gender differences in housework persist.

Almost 60 per cent of children between 5–15 years old were engaged in different combinations of activities. The distribution of children in different activities is summarised in Table 4. Among school children, 41 per cent only attended school, 34 per cent combined school and housework, 10 per cent combined school and work, and 15 per cent combined school, housework and work. On average, 16 per cent of children were no longer in school at the time of the survey.

Table 5 summarises patterns in the way children allocate their time among different activities. As long as children are involved in work activities, the work hours they provide are greater than their housework hours, regardless of school status. For instance, children in the ‘all’ category spend 41 per cent of their time in work and only 18 per cent in housework. Similarly, those in the category of ‘work and housework only’ spend 76 per cent in work. One striking finding is that children who combine school and work spend at least as much time in work as in classes. Their work burden is not lighter, even though they are in school.

**Table 4** Distribution of children in different activities

Activities	Number of children	Per cent
<b>In school</b>		
School only	1913	34.96
School and work only	382	6.98
School and housework only	1600	29.24
School, housework and work	723	13.21
<b>Total</b>	<b>4618</b>	<b>84.39</b>
<b>Not in school</b>		
<b>Total</b>	<b>854</b>	<b>15.61</b>
	<b>5472</b>	<b>100.00</b>

**Table 5** Time distribution of children in different activities (per cent)

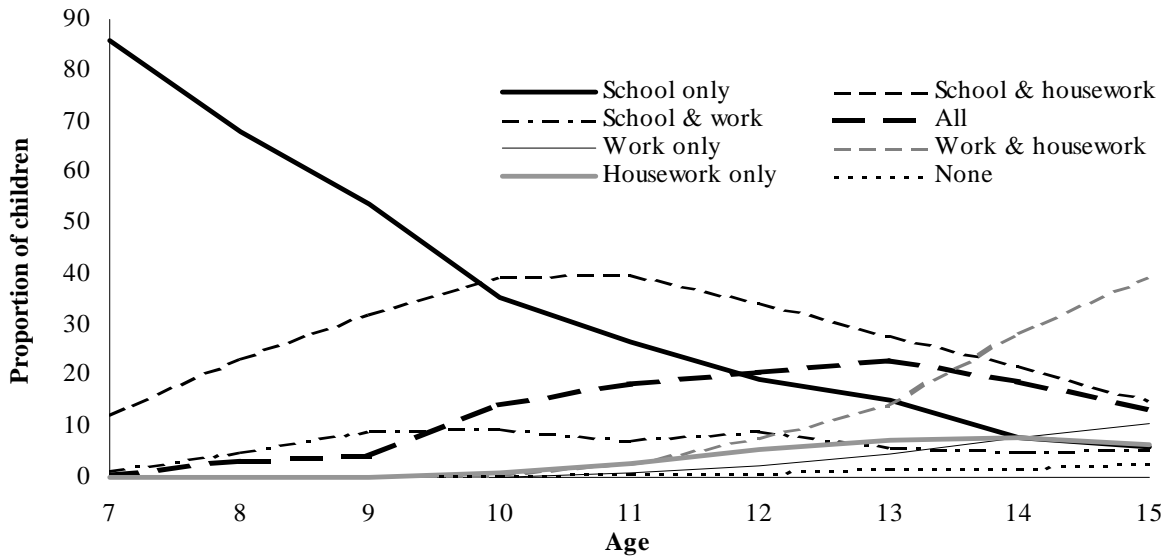
Activities	Class hours	Work hours	Housework hours
<b>In school</b>			
School only	100.0		
School and work only	46.0	54.0	
School and housework only	62.8		37.2
School, housework and work	41.1	40.9	18.0
<b>Not in school</b>			
Work only		100.0	
Work and housework only		75.7	24.3
Housework only			100.0
Doing none			

Figure 1 shows that the 'school and housework only' combination is the most likely for young school children. Nonetheless, the proportion of school children in the 'all' category becomes at least as important as 'school and housework only' for children around 13 years of age. The category of 'work and housework only' is more common among older children, accounting for over 40 per cent of children at 15 years.

What are the implications of these time allocation patterns? The number of activities in which children participate expands with age. As children grow older, a trade-off between the time children spend in class and in other economic activities, namely, work and housework, becomes obvious. Does this trade off reflect a negative relationship between leisure and the age of children, particularly school children? If it does, then the expansion of children's effort into more activities as they grow older does not merely imply a reshuffling of their time among activities; it reduces their leisure.



**Figure 1** Distribution of children in different combinations of activities



## The empirical model and results

Due to data constraints, a few modifications are necessary before we can put the theoretical model developed earlier under empirical scrutiny. We face a severe problem with wage data.

Limitations in the wage data stem from several sources. First, the wage sector in Vietnam is underdeveloped. Among the population who had been employed in the preceding 12 months, the Vietnam Living Standards Survey found that only 9.5 per cent were wage earners. Among 6672 children, only 1092 fathers reported receiving a wage for their main job in the preceding 12 months. The number of observations actually used in the regression was further reduced due to missing values in other independent variables. For instance, when we estimated the leisure equation, the sample size for children no longer in school fell from 539 to only 56. Second, missing values in the mother's identification number have added to the problem of limited wage data. Without the mother's identification number, we could not match children with the wage information of their mother. Among the 2963 mothers we could match with their children, only 356 reported receiving wages. Others were either self-employed, or did not report wages. The severe problem of missing wage data, especially data on the mothers' wages, has made unreliable the usual remedy of using the predicted wage rate in the equation. The predicted wage based on such a small wage sample may be quite far from the true values.

The limited data on parents' wages prevent us from explicitly including it as one of the independent variables in our empirical model. To overcome this, parents' education is used as a proxy for their wages.

Since most children are not involved in paid work (only about 114 children reported receiving a wage), we do not have wages for them. Instead, children's demographic characteristics are included to capture their earning capacity.

In order to understand the interactions among different activities and their impact on children's leisure better, we estimate hour-equations for each activity using a tobit model as well as a leisure equation using ordinary least squares (OLS).<sup>2</sup> The leisure regression is only run on those children who reported their participation status (participants and non-participants are both included) in all three activities. Leisure equations for school children and children no longer in school are also estimated to investigate any behavioural differences.<sup>3</sup> The detailed results of the hour-equations and the leisure equation are reported in Appendices 3 and 4 respectively. The chi-square statistics reject the null hypotheses that the explanatory variables are jointly equal to zero for both the hour-equations and the leisure equation. The pseudo R-squares are reasonable for the work hour-equation and the leisure equation, but are rather low for the other two regressions. Table 6 summarises the results of selected variables which are significant in at least two activities in the hour-equations and their implications on children's leisure. It also presents selected results of the leisure equation.

Children's age is important in determining their activities (Cain 1980; Khuda 1991; Nag, White and Peet 1980; White 1975). In line with the literature, the tobit results suggest that children's age and its squared term are very important in explaining children's time use behaviour. As a child's age increases at the mean by a year, his or her work and housework hours will increase by 2.8 hours and 1.3 hours per week, but class hours will fall by 1.3 hours per week.

The implication is that, because they expand their effort into more activities, children enjoy less leisure time as they grow older. The age variable and its squared term are, however, not found to be significantly different from zero in the leisure equation. Nonetheless, the negative sign supports the proposition that older children have less leisure time. Further dividing the sample into two groups, we find that school children enjoy less leisure, relative to those children no longer in school. This result highlights the intensified competitiveness of time use for school children.

The gender variable takes the value 1 if the child is a boy and 0 if a girl. Being a boy has a positive net effect on leisure. Boys have 2.7 hours per week more leisure time than girls do. This is related to the heavier involvement of girls in household chores. The result holds regardless of whether or not the children are attending school.

**Table 6 Summary of the results**

	Hour-equations (Tobit)				Leisure-equations (OLS)		
	<u>C</u>	<u>W</u>	<u>H</u>	<u>L</u>	<u>All</u>	<u>School</u>	<u>Not in school</u>
Age	-	+	+	-		-	
Girls	-		+	-	-	-	-
Father's years of schooling	+	-	-	+			
Mother's years of schooling	+	-	+	-			
Number of children under 5	-	+	+	-	-	-	
Urban	+	-	-	+			
North	-	+	+	-	-	-	-

In line with the leisure equation, the tobit results suggest that gender differences do not lie in work hours, but in class and housework hours. Girls provide more housework hours and spend less time in class relative to boys. Girls' involvement in housework (2.49 hours per week) more than offsets their fewer class hours. This implies that girls enjoy less leisure on average than boys. In addition, girls are more likely to face a trade off between class hours and housework hours than boys. This gender difference in the consumption of leisure foreshadows the heavier burden in home production faced by girls as they approach adulthood.

Grandparents in Vietnam often play an important role in the house especially in home production. They can substitute for children in doing household chores. With grandparents doing housework, children's involvement in other activities may increase. In line with expectations, the results of the tobit models show that the presence of grandparents increases children's work hours by 1.3 hours per week, but reduces their housework hours by half an hour per week (Appendix 3). This finding implies that grandparents may substitute for children in doing housework, thus reducing children's housework hours. The obvious question is whether children in these households enjoy more leisure as a result. Our findings do not support such a notion. Instead, the presence of the grandparents is found to have a net negative effect on children's leisure. Children's leisure time falls 1.6 hours per week if grandparents are present. We find that children shift from housework to paid work when grandparents are present, rather than maintaining a higher proportion of leisure hours.

Parental characteristics are also expected to exert influence on children's time allocation patterns. As mentioned earlier, parents' years of schooling are proxies for their wage rates. The tobit results indicate that an increase in father's wage rate leads to a rise in children's class hours and a fall in their work and housework hours. The implication is a net increase in children's leisure. Given that leisure is a normal good, when the father's income increases, the household can afford to consume more of the leisure good.

An increase in mother's wage rate leads to a similar result—a fall in children's work hours and a rise in their class hours. Children's housework hours increase, however, in response to increases in the mother's wage rate. The results suggest that cross-substitution between mother and children is dominant. Provided that the substitution effect is dominant, an increase in her wage rate increases her labour supply and makes the opportunity cost of her housework time dearer. Since the relative time cost of children doing housework is lower, children may increase their housework hours, substituting for the mother. Therefore, children's leisure falls when their mother's wage rate increases. Children's role in enabling their mother's labour—often cited in the development literature (Cain 1980; Kanbargi 1991; World Bank 1996)—is underscored.

Household composition is no doubt an important factor in determining how children use their time. The number of children under five years old affects the other children's leisure negatively. With one additional younger child in the house, older children enjoy 1.5 hours less leisure time per week. This probably indicates that increases in time allocated to housework and work more than offset the reduction in class hours. Higher numbers of children under five years old may demand more hours in home production from the mother in terms of childcare. Therefore, older

children may substitute for the mother in doing housework and also, to a lesser extent, work-related activities. The demand for older children's time is then reflected in the fewer hours they spend attending classes. This proposition is further supported by the tobit results. One additional child under five years old increases older children's work and housework allocations by 1.3 and 0.7 hours per week. There is a net reduction in leisure time because the fall in class hours is offset by an increase in housework hours.

The impact of the proportion of adult females is the largest compared with other slope parameters in explaining variation's in children's leisure time. The presence of more female adults in the household increases children's leisure time by 6.7 hours per week. This implies that females spend more time doing housework. Our tobit results also show that this variable is important in explaining children's housework hours, reflecting the underlying traditional division of labour.

An increase in non-labour income increases children's leisure time. The tobit results suggest that the rise in the non-labour income mainly comes from the fall in children's work hours. The fairly small magnitude may reflect the fact that the variable suffers from under-reporting.

The regional dummy equals 1 if a child is from the North. This dummy variable is meant to capture the influence of geographical variations. The South is more developed than the North, and has higher expenditures per capita (25.6 thousand dong in the South versus 17.7 thousand dong in the North), better infrastructure, overseas connections, and entrepreneurship.

Children from the North are found to have six hours less leisure time on average than children from the South. The tobit results indicate that children in the North work 7 hours more and do one hour more housework, but spend an hour less in classes than their peers in the South. This implies that children in the North enjoy less leisure. The region in which the children live remains a significant factor regardless of their school status.

The significance of the regional dummy indicates that the stage of development of a region has implications on children's leisure and their time allocation. The more developed the region is, the more leisure children have because of their fewer work hours. In other words, non-work (leisure and education) is less of a luxury good in the households' consumption in the sense that households can afford to consume more of this good more the higher their income. Thus, more leisure is consumed in the more developed regions relative to the less developed ones.

## **Conclusion**

Analysis of the Vietnam Living Standards Survey 1992–93 has revealed that children enjoy less leisure time as they grow older and expand their effort into more activities. In other words, the expansion into more activities is not a mere reshuffling of children's time among different combinations of activities, it has negative implications on children's leisure time. Furthermore, the results suggest that school children in particular have less leisure time. This implies that devoting fewer hours to work and housework is not sufficient to offset class hours. No such negative relationship between children's age and leisure was found among children no longer in school.

In addition, the heavier involvement of girls in housework highlights the traditional division of labour, indicating the double burden of women. While labour policies have been directed to accommodating married women's burden inside the house, attention should be directed to the role of young female children in home production.

Furthermore, the analysis has shown that household composition and the age structure of the siblings are important factors. Profound regional differences are also evident. The South is more developed than the North, and children are found to enjoy more leisure and spend less time at work in the more developed regions. The results highlight the role of regional differences in shaping variations in children's time allocation behaviour.

In addition, the parents' wage increases have a positive effect on children's class hours. Children's leisure time responds differently, however, depending on whether the father or the mother receives the wage increase. Children enjoy less leisure time if the mother's wage rate increases because they often have to substitute for the mother in doing housework so that the mother can increase her labour supply outside the home. A rise in father's wage rate, however, leads to an increase in children's leisure, highlighting that the household income effect is dominant.

It is not the aim of this paper to define a minimum threshold of children's leisure time. This threshold will vary according to the cultural setting and regional and ethnic factors. Furthermore, by combining schooling with other economic activities, some children may be able to earn their way through school, which could result in a higher future income. Until we have a greater understanding of the negative effects of combining schooling with other activities on the leisure time of children over their life-cycle, we must be cautious in drawing welfare implications.

## Notes

<sup>1</sup> We decided to limit the analysis to children 5–15 years of age. Perhaps children in the upper secondary school should have been included in our sample, that is, the upper age limit of our target group could have been extended to 17 years. Given that the proportion of children not in school is quite large at ages greater than 15 years (around 60 per cent of children over 15 years of age were not in school), however, we decided to exclude all those over 15 years old.

<sup>2</sup> Positive leisure hours are observed across the sample.

<sup>3</sup> Strictly speaking, the decision of whether a child is in school or not is endogenous to how much leisure time he or she has. Due to the data limitation, however, a Heckman selection model cannot be used to correct for the endogeneity. Extra variables to capture the supply side of education are needed to model the choice equation for identification purposes. This information was, however, only collected in rural areas, not the urban areas.

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# Appendix 1

## Summary statistics for the models

**Table A.1 Summary statistics for the work hours equation**

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Dependent variable: Class hours  
Number of observations: 2781

Variable	Mean	Standard deviation	Minimum	Maximum
Class hours per week	14.86	9.19	0	56
Age	10.80	2.64	6	15
Age-squared	123.64	57.68	36	225
Gender	0.50	0.50	0	1
Father's years of schooling	8.04	3.76	1	21
Mother's years of schooling	6.65	3.50	1	20
Father's occupation	0.69	0.46	0	1
Mother's occupation	0.70	0.46	0	1
Presence of grandparents	0.17	0.38	0	1
Number of children under 5 years	0.48	0.71	0	3
Number of children between 5–15	2.75	1.08	1	7
Proportion of adult females	0.25	0.10	0.09	0.75
Ethnic	0.90	0.30	0	1
Urban	0.19	0.39	0	1
Region	0.58	0.49	0	1
Weekly non-labour income ('000 dong)	34.06	229.50	0	5976.54

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**Table A.2 Summary statistics for the class hours equation**

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Dependent variable: Work hours per week  
Number of observations: 4183

Variable	Mean	Standard deviation	Minimum	Maximum
Work hours per week	8.62	15.54	0	85
Age	10.41	2.64	6	15
Age-squared	115.24	56.49	36	225
Gender	0.51	0.50	0	1
Father's years of schooling	7.87	3.69	1	21
Mother's years of schooling	6.43	3.45	1	20
Father's occupation	0.72	0.45	0	1
Mother's occupation	0.73	0.44	0	1
Presence of grandparents	0.18	0.38	0	1
Number of children under 5 years	0.53	0.73	0	3
Number of children between 5–15	2.78	1.10	1	7
Proportion of adult females	0.24	0.10	0.09	0.75
Ethnic	0.89	0.32	0	1
Urban	0.15	0.36	0	1
Region	0.55	0.50	0	1
Weekly non-labour income ('000 dong)	30.30	191.81	0	5976.54

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**Table A.3 Summary statistics for the work hours equation**

Dependent variable: Housework Hours  
Number of observations: 4183

Variable	Mean	Standard deviation	Minimum	Maximum
Housework hours per week	8.62	15.54	0	85
Age	10.41	2.64	6	15
Age-squared	115.24	56.49	36	225
Gender	0.51	0.50	0	1
Father's years of schooling	7.87	3.69	1	21
Mother's years of schooling	6.43	3.45	1	20
Father's occupation	0.72	0.45	0	1
Mother's occupation	0.73	0.44	0	1
Presence of grandparents	0.18	0.38	0	1
Number of children under 5 years	0.53	0.73	0	3
Number of children between 5–15	2.78	1.10	1	7
Proportion of adult females	0.24	0.10	0.09	0.75
Ethnic	0.89	0.32	0	1
Urban	0.15	0.36	0	1
Region	0.55	0.50	0	1
Weekly non-labour income ('000 dong)	30.3	191.81	0	5976.54

**Table A.4 Summary statistics for the leisure equation**

Dependent variable: Leisure  
Number of observations: 2779

Variable	Mean	Standard deviation	Minimum	Maximum
Leisure time per week	137.97	15.93	32	168
Age	10.80	2.64	6	15
Age-squared	123.59	57.68	36	225
Gender	0.50	0.50	0	1
Father's years of schooling	8.04	3.76	1	21
Mother's years of schooling	6.66	3.50	1	20
Father's occupation	0.69	0.46	0	1
Mother's occupation	0.70	0.46	0	1
Presence of grandparents	0.17	0.38	0	1
Number of children under 5 years	0.48	0.71	0	3
Number of children between 5–15	2.75	1.08	1	7
Proportion of adult females	0.25	0.10	0.09	0.75
Ethnic	0.90	0.30	0	1
Urban	0.19	0.39	0	1
Region	0.58	0.49	0	1
Weekly non-labour income ('000 dong)	34.06	229.58	0	5976.54



**Table A.5 Summary statistics for the leisure equation for schoolgoers**

Dependent variable: Leisure  
 Number of observations: 2240

Variable	Mean	Standard deviation	Minimum	Maximum
Leisure time per week	140.13	13.28	32	167
Age	10.09	2.38	6	15
Age-squared	107.43	50.10	36	225
Gender	0.53	0.50	0	1
Father's years of schooling	8.41	3.83	1	21
Mother's years of schooling	7.05	3.55	1	20
Father's occupation	0.66	0.47	0	1
Mother's occupation	0.68	0.47	0	1
Presence of grandparents	0.18	0.38	0	1
Number of children under 5 years	0.49	0.71	0	3
Number of children between 5–15	2.68	1.04	1	6
Proportion of adult females	0.25	0.09	0.09	0.75
Ethnic	0.90	0.30	0	1
Urban	0.21	0.41	0	1
Region	0.60	0.49	0	1
Weekly non-labour income ('000 dong)	37.78	251.75	0	5976.54

**Table A.6 Summary statistics for the leisure equation for non-schoolgoers**

Dependent variable: Leisure  
 Number of observations: 539

Variable	Mean	Standard deviation	Minimum	Maximum
Leisure time per week	128.95	21.80	62	168
Age	13.75	1.27	10	15
Age-squared	190.76	33.51	100	225
Gender	0.37	0.48	0	1
Father's years of schooling	6.48	2.99	1	20
Mother's years of schooling	5.01	2.76	1	15
Father's occupation	0.82	0.39	0	1
Mother's occupation	0.78	0.41	0	1
Presence of grandparents	0.16	0.36	0	1
Number of children under 5 years	0.46	0.71	0	3
Number of children between 5–15	3.04	1.18	1	7
Proportion of adult females	0.24	0.10	0.09	0.6
Ethnic	0.88	0.32	0	1
Urban	0.10	0.30	0	1
Region	0.52	0.50	0	1
Weekly non-labour income ('000 dong)	18.56	90.04	0	1632.69

## Appendix 2 Definition of variables used

### Demographic characteristics of the child

**Age (AGE and AGESQ).** The age of the children in the target group is between 5–15, inclusive. The square term is to capture the curvature of the age variable.

**Gender (GENDER).** Takes on the value of 1 if the child is a boy and 0 if a girl.

### Parental characteristics

**Father's and mother's years of schooling (FSCH and MSCH).** Instead of calculating the year of schooling by the traditional method—subtracting the years of experience and the school entering age from age—I derive the year of schooling by combining the data on the highest grade completed, the highest year of high school, vocational school, university/college finished and the highest degree/diploma attained. For example, if a person reported that his highest degree/diploma was technical worker, his highest grade completed was Grade 9, and the year of vocational school he completed was first year, then his year of schooling is 10. If a person answered none to all three questions, then this person would have zero years of schooling. The reason for not using the traditional method is the possible interruptions to schooling owing to the war and political instability in the 1970s.

**Father's and mother's occupation dummy (FOCC and MOCC).** These variables takes the value 1 if he or she has an agricultural occupation; otherwise, they take the value 0.

### Household characteristics

**Weekly non-labour household income (WKNL).** Measured in thousands of dong, total non-labour household income includes sources such as

1. social fund (for example, age pension, disability pension) from the government
2. social subsidies from organisation and production units
3. interest income on savings, stock and loans
4. insurance claims paid
5. gifts, both in cash and in kind, including those related to weddings, funerals, and birthdays.
6. dowry, brideprice or inheritance
7. lottery winnings
8. income from the lease of buildings, equipment, houses, land and draft animals
9. income from the lease of durable goods, including utensils
10. income from selling buildings and equipment
11. income from selling vehicles, durable goods and jewellery
12. remittances received.

To derive the weekly figure, the total non-labour household income is then divided by 52 weeks.

**Grandparents (GRANNY).** This dummy variable takes on the value 1 if there are grandparents of the children in the household. It takes on the value 0 otherwise.

**Number of children under five years old (UNDER5).** This variable is defined as the number of children in the household under 5 years of age.

**Number of children between 5 and 15 years (NOCHILD(5–15)).** This variable is defined as the number of children between 5 and 15 years in the household.

**Proportion of female adult members (PROPF).** The variable is the ratio of female adults (over 15 years of age) to the household size.

**Ethnic (ETHNIC).** This is a dummy variable to capture the effect of ethnic differences on children's participation behaviour. It takes on the value 1 for children of the Kinh majority and 0 for children of minority groups.

**Urban (URBAN).** This dummy variable takes the value 1 if the household is in an urban area; it takes the value 0 otherwise.

**Region (REGION).** This is a dummy of the North and the South of Vietnam. The North includes the northern mountainous area, the Red River Delta, and the north-central area. The South includes the central coast, the central highlands, and the Mekong Delta.

### Appendix 3 Single activity

Single activities include work hours, class hours and housework hours. Table A3.1 summarises the frequencies of positive hours reported in each activity.

The ordinary least squares method (OLS) is inappropriate for dealing with the time allocation pattern summarised in Table A3.1. The following time allocation equations for children are estimated with the tobit model. The dependent variable,  $y_i$ , where  $i = 1, 2$  and  $3$ , indexes the time that a particular child spent in different types of activity, namely, work, school and housework respectively.

$$y_i = b_{i0} + b_{i1} X + b_{i2} Y + b_{i3} Z + u_i$$

where

$X$  is children's demographic characteristics

$Y$  is parental characteristics

$Z$  is household characteristics

The empirical results of these models are presented in Table A3.2. The chi-square statistics reject the null hypothesis that the explanatory variables are jointly equal to zero. The pseudo R-square is reasonable for the work hour equation, but is rather low for the other two regressions. The summary statistics of the variables used are presented in Appendix A3.2. We will focus our discussion on those variables which are important and statistically significant.

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**Table A3.1 Observed frequencies of dependent variables**

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	Number of observations	Number of non-participants	
		<u>Frequency</u>	<u>Percentage</u>
Children's housework hours	6069	2862	47.16
Children's class hours	4091	854	20.87
Children's work hours	6071	4206	69.30

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**Table A3.2 Results of hour regressions for different single activities**

Symbol	Variable	Class		Work		Housework	
Coefficient		dF/dx	t-value	dF/dx	t-value	dF/dx	t-value
<b>Children's characteristics</b>							
AGE	Age	5.340	-1.224	<b>8.125</b>	13.920	2.724	<b>5.908</b>
AGESQ	Age-squared	-0.319		<b>-10.520</b>	-0.234		<b>-2.262</b>
GENDER	Gender	2.260	1.788	<b>5.866</b>	-0.716	-0.220	-0.596
<b>Parental characteristics</b>							
FSCH	Father's years of schooling	0.233	0.184	<b>3.596</b>	-0.637	-0.196	<b>-2.980</b>
MSCH	Mother's years of schooling	0.324	0.257	<b>4.429</b>	-0.399	-0.122	<b>-1.676</b>
FOCC	Father's agricultural occupation	-1.495	-1.183	<b>-2.880</b>	9.755	2.995	<b>5.499</b>
MOCC	Mother's agricultural occupation	0.661	0.523	1.185	6.092	1.870	<b>3.286</b>
<b>Household characteristics</b>							
GRANNY	Presence of grandparents	-0.427	-0.338	-0.770	4.498	1.381	<b>2.645</b>
UNDER5	Number of children under 5 years	-0.691	-0.547	<b>-2.271</b>	2.260	0.694	<b>2.373</b>
NOCHILD	Number of children (5–15)						
PROF	between 5–15 years	-0.324	-0.256	-1.500	1.658	0.509	<b>2.528</b>
ETHNIC	Proportion of adult females	3.962	3.135	1.501	-8.306	-2.550	-1.036
URBAN	Ethnic	1.852	1.465	<b>2.836</b>	-3.861	-1.185	<b>-2.096</b>
REGION	Urban	2.651	2.098	<b>4.337</b>	-7.759	-2.382	<b>-3.363</b>
WKNL	Region	-1.154	-0.913	<b>-2.584</b>	22.900	7.030	<b>14.748</b>
	Weekly non-labour income ('000 dong)	-0.001	-0.001	-1.088	-0.019	-0.006	<b>-2.672</b>
Constant		-10.308		<b>-2.796</b>	-152.811		<b>-10.955</b>
Number of observations		2781		4185			-54.987
Chi-square		778.290		1652.070			4183
Degree of freedom		0.042		0.103			1093.770
Pseudo R-square			0.103			0.041	0.053

**Notes:** a) The t-values in bold are significant at the 5 per cent level and t-values in italic are significant at the 10 per cent level.  
 b) The proportions of children at work, in school and doing housework are 0.307, 0.8510 and 0.5284.

c) Given the censoring, the marginal effect is  $\frac{\partial E[y_i | x_i]}{\partial x_i} = \beta \Phi(\beta' x_i / \sigma)$ .

## Appendix 4 Leisure

**Table A4.1 Results with leisure as the dependent variable**

Symbol	Variable	Coefficient	t-value
<b>Children's characteristics</b>			
AGE	Age	-1.419	-1.589
AGESQ	Age-squared	-0.063	-1.542
GENDER	Gender	2.718	<b>5.159</b>
<b>Parental characteristics</b>			
FSCH	Father's years of schooling	0.119	1.338
MSCH	Mother's year of schooling	-0.035	-0.348
FOCC	Father's agricultural occupation	-0.848	-1.186
MOCC	Mother's agricultural occupation	0.090	0.118
<b>Household characteristics</b>			
GRANNY	Presence of grandparents	-1.566	<b>-2.066</b>
UNDER5	Number of children under 5 years	-1.456	<b>-3.508</b>
NOCHILD(5–15)	Number of children between 5–15 years	-0.267	-0.913
PROPF	Proportion of adult females	6.691	<i>1.862</i>
ETHNIC	Ethnic	0.574	0.644
URBAN	Urban	1.358	1.610
REGION	Region	-6.325	<b>-10.338</b>
WKNL	Weekly non-labour income	0.003	<b>2.780</b>
	Constant	162.372	<b>32.230</b>
	Number of observations	2779	
	Chi-square	61.910	
	Degree of freedom	15	
	Adjusted R-square	24.750	

**Note:** The t-values in bold are significant at the 5 per cent level and t-values in italic are significant at 10 per cent level.

**Table A4.2 Results with leisure as the dependent variable for schoolgoers and non-schoolgoers**

Symbol	Variable	In school Coefficient	Not in school t-value	Coefficient	t-value
<b>Children's characteristics</b>					
AGE	Age	-2.874	<b>-3.319</b>	-0.341	-0.026
AGESQ	Age-squared	0.012	0.301	-0.150	-0.299
GENDER	Gender	1.637	<b>3.320</b>	7.382	<b>3.969</b>
<b>Parental characteristics</b>					
FSCH	Father's years of schooling	0.100	1.233	0.250	0.709
MSCH	Mother's year of schooling	-0.095	-1.038	0.156	0.391
FOCC	Father's agricultural occupation	-0.739	-1.140	-1.042	-0.368
MOCC	Mother's agricultural occupation	-0.978	-1.375	3.988	1.498
<b>Household characteristics</b>					
GRANNY	Presence of grandparents	-0.796	-1.129	-4.658	<i>-1.791</i>
UNDER5	Number of children under 5 years	-1.622	<b>-4.153</b>	-0.874	-0.611
NOCHILD(5–15)	Number of children between 5–15 years	-0.322	-1.137	-0.049	-0.054
PROPF	Proportion of adult females	4.837	1.409	11.096	0.989
ETHNIC	Ethnic	0.494	0.587	-0.170	-0.059
URBAN	Urban	1.216	1.593	0.194	0.056
REGION	Region	-5.393	<b>-9.514</b>	-9.340	<b>-4.207</b>
WKNL	Weekly non-labour income	0.003	<b>2.717</b>	0.023	<b>2.327</b>
Constant		170.930	<b>35.900</b>	157.883	<i>1.814</i>
Number of observations		2240.000		539.000	
Chi-square		48.670		5.640	
Degree of freedom		(15, 2224)		(15, 523)	
Adjusted R-square		0.242		0.114	

**Note:** The t-values in bold are significant at the 5 per cent level and the t-values in italics are significant at the 10 per cent level.

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**Table x Average hours used of children (excluding non-participants)**

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Age	Work hours	Class hours	Housework	Work and housework
7	21.00	16.00	7.00	28.00
8	15.50	16.90	7.40	22.90
9	19.57	15.00	8.21	27.79
10	18.51	16.74	7.55	26.05
11	19.09	18.51	8.74	27.83
12	22.15	20.65	8.95	31.10
13	18.25	20.80	8.41	26.65
14	19.37	21.32	8.92	28.29
15	19.08	21.68	9.55	28.63