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Child labor in Vietnam: Issues and policy implications

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ABSTRACT

This study examined factors associated with child labor situation in Vietnam, using data from the Vietnam Household Living Standards Survey (VHLSS) in 2012. A binary logistic model was applied to examine determinants of working status for children aged 6–17, and then ordinary least square and logit regression models were utilized to identify factors associated with child labor's indicators, which were presented by the number of working hours and types of economic activities. The findings revealed important roles of children's age and education level, ethnicity and their households' credit status on their provision of labor. In addition, the study found that preferential loans aiming at reducing poverty and improving household living standards tended to encourage child labor. From these findings, the paper provided policy implications to mitigate child labor issues in Vietnam.

1. Introduction

Child labor is a common issue in developing and poor countries. In order to survive and support their families, many children have to ignore education and health in order to involve in economic activities. It is sadly reported that a significant number of children are working in hazard environment and performing risky tasks for long hours. The Government of Vietnam has paid attention to the issue of child labor, which has been presented in several legal documents such as the Law on Child Protection, Care and Education in 2004 (National Assembly of Vietnam, 2004) and the Vietnam Labor Code in 2013 (National Assembly of Vietnam, 2013). However, it was reported in the Vietnam National Survey on Child Labor (VNSCL) that 1.75 million out of the total of 18.3 million children were child laborers. Moreover, 85% of working children lived in rural area and they usually started working at the age of 12. About 67% of child laborers worked in agriculture, while the proportions were 16% and 17% in industry and construction and services, respectively. It should be noted that child labor is positively related to household income, while negatively related to schooling (Ministry of Labour, Invalids and Social Affairs – MOLISA, General Statistics Office – GSO, & International Labour Organization – ILO, 2014).

There are several studies on determinants of child labor as well as the influence of child labor on their families' income and their own future. For instance, Yunita (2006) studied how such factors as family prosperity and parents' highest education influenced child labor in Indonesia, and found that a rise in income substantially reduced boys' working hours, but the effect on girls was not clear. Orbeta (2005), Rickey (2009) found the correlation between poverty and child labor, and the negative link between child labor and schooling. Most of the studies indicated that a working child could support income to his/her family, but lost his/her educational opportunity at the same time.

Vietnam has been among the emerging countries that contained the extreme risk of child labor. Although there have been a significant number of papers on child labor and its related issues in Vietnam, as shown below, most of them were descriptive analyses with a focus on the link between poverty and child labor. As such, the issue of child labor needs to be studied and observed more closely and continuously. This study aimed to investigate different individual and household factors that influenced child labor situation in Vietnam, in order to provide policy suggestions to the Government of Vietnam in mitigating this issue.

2. Literature review

Child labor is not a new issue in the world, especially in emerging

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and developing countries. However, the issue is still a source of research interests for many researchers. In a study on the determinants of child labor in rural India, Fors (2007) – using data from the Human Development Profile for India, which involved 33,229 households that living in 1,765 villages in 16 Indian states – indicated that i) school attendance was positively correlated while non-school actives was negatively correlated with household's income; ii) the more educated the parents were, the higher probability that they sent their children to school; and iii) in the case of family work, land and labor market imperfections over-influenced the credit market imperfections.

Yunita (2006) explored the determinants of child labor in Indonesia, using the pooled data of the Indonesia Family Life Survey (IFLS) in 1997 and 2000, which included 7,629 households and 10,500 households respectively. Using probit models, the author explored impacts of independent variables (such as child age, household's per capita expenditure, community level average wage) and the probability that a child went to work and/or went to school. These studies indicated that the higher income was, the less likely boys would go to work. In contrast, the effect of increasing income was not highly correlated to girls' likelihood to work. Moreover, an inverted U-shape curve between log of household's per capita expenditure and boy's educational attainment was found. Regarding the role of parents' education level on child labor, it was found that mother's education level had higher influence on a child than did that of father.

In order to discover the determinants of child labor in a developing country like India, Sahu (2013) studied the primary data collected from Cuttack city of Odisha. A structured questionnaire was designed to gather information from 50 child laborers and related parties (such as child workers' families and their employers). Interviewees were randomly chosen from five locations which were identified with high concentration of child laborers: business areas with a large number of shops and malls, areas near bus stops/ train stations, slums. Two multiple regression models were utilized to study the impacts of elements related to family and children characteristics on the working hours as well as income of working child. The results indicated that low education, poverty, bad working and living conditions, jobs' insecurity, low income and long working hours were common characteristics among child workers. Children were forced to be self-employed or work for paid jobs to help improve their family income. Thus, the study recommended that public and government policies be actively implemented to reduce poverty, unemployment and increase awareness of adults on the negative impact of early working on children.

Rickey (2009) found a powerful link between child labor and income in Philippines, using data from the Philippines' 2001 Survey on Children 5–17 Years Old (namely, SOC). Results from multinomial logit model showed that the less biologically a child was attached to the household head, the more likely he/she would involve in paid activities. Moreover, the more education a child obtained, the more likely he/she would invest in his/her children education when he/she grew up and became a household head.

Although others studies that found the positive link between poverty and child labor, Ray (2000) did not indicate the significant relationship between family's poverty and child labor. Using data from the Ghana Living Standards Measurements Survey (GLSS) in 1988/1989, the regression results showed that there was not a significant link between children's working hours and the number of children in each household. Furthermore, there was a positive relationship between variables representing child and/or family characteristics and child's working hours. Following the research interest in child labor, Ray (2001) explored the relationship between child labor and child's educational attainment in Nepal. It was found that there was a U- shaped link between inequality and child labor while there was an inverted U-shaped relationship between inequality and child education. In addition, poverty was not as important as inequality in explaining child participation in labor market. School attendance helped significantly reducing the time that child had to spend on working.

In his study on the relationship between child labor and parents' work status and earnings in Philippines, Orbeta (2005) evaluated the data from 2002 Annual Poverty Indicator Survey (APIS). A model was constructed to study the impact of independent elements such as the number of children, the characteristics of individual, household and society on parents' participation in labor force and their income. It was found that the number of children negatively affected mother's work status while its connection with father's labor force participation was statistically insignificant. Moreover, an additional child showed a regressive influence on the earnings of couples at the bottom quintile. As a result, the study suggested that increasing awareness on family planning was a critical task for the government.

Analyzing data from different sources such as the Labor Force Surveys and the Education Statistics in Brief, Tzannatos (2001) explored the characteristics of child labor in Thailand. The results indicated that there was not a labor shortage in Thailand but many Thai children had to participate in labor market because their families were too poor to send them to school. Consequently, the study suggested that public support programs focusing on children in needy situation or geographical areas with difficulties to be conducted so as to make changes in child labor situation in Thailand.

De Carvalho (2001) studied the link between household income and child labor and schooling in Brazil, using data from PNAD, which was collected in 1989, 1990, 1992, and 1993 with approximate 100,000 households. It showed that social benefits for older persons could improve school participation rate among children, especially the girls aged 12–14. Moreover, for girls living with at least one old-age beneficiaries, the 20% difference between 100% enrollment and counterfactual enrollment rates was diminished. In contrast, the effect on boys was less powerful than that for girls.

Grimsrud (2001) collected and analyzed various studies on child labor to provide an explanation on both demand and supply of child workers as well as to find the relationship between those supply and demand to others sources such as the availability of education. By reconciling the findings of previous studies, it was found that poverty and household income were the leading causes of child labor. Negative links between family financial situation, adults' wage and children's participation in labor market were mentioned in various studies such as Ray (2000, 2001). Another cause of child labor was the work allocation among family members. Normally, if there was a change in adults' participation in labor market, children's working status would be adjusted. The "added worker effect" was analyzed in researches as a strong and interesting phenomenon among low-income families. If the household' bread-winner encountered difficulties in the labor markets, other family members as well as children would be sent to the labor market to search for job opportunities. In contrast, child labor was an option for family's agricultural work or business. The involvement of young workers in family's agricultural work or business allowed adult members to be more active in the labor market and to get paid jobs. The demand for child labor was originated from their lower wage compared to adults who performed similar jobs. Furthermore, labor shortage was also a reasonable explanation for child labor phenomenon.

Child labor issue in Vietnam has been discussed by both local and international researchers. Edmonds and Turk (2002) applied regression analysis with data from the Vietnam Living Standards Surveys (VLSS) in 1992/93 and 1997/98 to investigate the downward trend of child labor. The authors proved that there was a dramatic decline in child labor in 1990′s in both urban and rural areas of all ecological regions, except the rural Central Highlands. Poverty was responsible for the continuity of child labor in the country because the families were too poor to survive without income contributed by children. The gender inequality existed in all age groups. The empirical results proved that more girls had to work than boys, and they had to work for long hours while performing traditional work. Furthermore, although Vietnam had high primary education participation rate, child workers had low rate. It was recommended that Government's program should pay more attention to the

children's activities to reduce child labor.

Studying the impact of globalization on child labor in Vietnam, Edmonds and Pavcnik (2002) detected a negative relationship between price rice and child labor with the data from VLSS in 1992/1993 and 1997/1998. The influence of such factors as age, gender, season controls, economy-wide time differences and commune fixed effects on child labor was considered. In urban areas, because families were consumers and were not benefited from an increase in rice price, child labor moved in the same direction as rice price. Furthermore, it was observed that the quantity of land owned by household was negatively correlated to child labor in the context of rising rice price.

Olarreaga et al. (2010) explored the relationship between foreign direct investment (FDI) and child labor in Vietnam. The multinomial logit estimations of each gender's participation in primary occupation categories (idle; domestic work; family work; and non-family work) were applied to detect the influence of household assets, school availability, and various characteristics of children, their parents, their households, and village on child labor. Analyses with data from the Vietnam Household Living Standards Survey (VHLSS) in 2002, 2004 and 2006 showed that FDI contributed to the decline in child labor as well as the increase in school enrollment rate. The empirical results proved that FDI in services did not help reduce child labor as FDI in other sectors.

Mavrokonstantis (2001) applied the data from the second and third rounds of the Young Lives Longitudinal Survey in Vietnam. The ordinary least square (OLS) regression model with different variables showing child-, caregiver-, household-related characteristics was applied and the results showed insignificant link between child labor and education attainment in rural areas. In contrast, a strong negative impact of child labor on schooling was found in urban areas.

Le and Homel (2015) also conducted a study on education attainment and child labor with data from VLSS in 1997/1998. Similar to Mavrokonstantis (2001), the authors limited their sample in rural areas. The econometric estimations included a Tobit regression for child labor (measured by the average daily working hours of child over the past year) and an ordered-probit regression for academic achievement (measured by academic score achieved in the past year). The results implied that the more children worked, the more negative their academic achievement was. The negative impact was even more significant among girls. Additionally, the financial situation of household was proved to be one of the most influencing determinants of child labor. Ethnic minority was also a decisive factor because children from this population group had to work more and obtained lower academic score than their Kinh counterpart.

MOLISA, GSO and ILO (2014) released the first "Viet Nam National Child Labor Survey 2012", which provided national database on child labor and encouraging further studies on child workers. The survey revealed the rate 84.9% of 1.7 million Vietnamese child laborers living in rural areas, while the remainders were from urban areas. Boys were observed to be more proactive in the child labor market, as the participation rate of boys and girls were 59.78% and 40.22%, respectively. Moreover, children from 15 to 17 years old dominated the children workforce. Regarding working hours, the survey indicated that about 32.4% of working children have to work more than 42 h per week, and the rate of boys' working hours exceed 42 h each week was higher than girls' (33.3% and 31.1%, respectively). Interestingly, although children from urban areas did not participate in labor market as many as those from rural areas, they tended to have longer working hours (for those working for more than 42 h per week, urban rate was 48.6% while rural rate was only 29.5%). Additionally, child laborers in Vietnam concentrated on agriculture sector which was labor intensive but low income. This survey provided only statistical descriptions of child labor in Vietnam and it did not analyze its determinants.

3. Material and methods

3.1. Material

This study used data from the Vietnam Household Living Standard Survey (VHLSS) in 2012 (hereafter VHLSS 2012), which was conducted by the General Statistics Office of Vietnam (GSO). The data were collected from 63 provinces/cities with 36,655 individuals living in 9,399 households in 3,133 communes. The survey collected data in four periods (March, June, September, and December) and all was face-to-face interviews with the surveyed household heads and commune officers.

In VHLSS, there were two sets of questionnaires – one for households, and the other for communes. In the former, the information covered both individual background (such as age, sex, ethnicity, marital status, the highest educational level, and access to healthcare services) and household background (such as household income and expenditure sources, and participation in poverty alleviation/development programs). In the latter, the information reflected commune's living conditions (such as electricity, water, roads, and schools).

This study used only information from the former questionnaire. Regarding child labor, this questionnaire contained related questions about i) working status; ii) the number of working hours; and iii) types of work.

3.2. Methods

3.2.1. Child labor classification

In order to generate groups of child laborers from VHLSS 2012 data, we used the definition of a child worker as provided by MOLISA, GSO and ILO (2014), in which a child worker was any person aged 5–17 who participated in producing, trading or service activities. These activities, which did not include household chores, could be paid or unpaid, part-time or full-time, frequent or infrequent, legal or illegal, and last for at least one hour per day on any day of the reference week. In addition, if working conditions were used as the base for child labor classification, the total working hour was the fundamental criteria.

VHLSS 2012 only collected work-related information from those aged 6 and above, and thus children in this study were those aged 6–17. In particular, three groups of child laborers were as follows:

- Group 1: children aged 6–11 years old and worked for one hour or more per day, or for five hours or more per week.
- Group 2: children aged 12–14 years old and worked for four hours or more per day, or for 24 h or more per week.
- Group 3: children 15–17 years old and involved in economic activities for seven hours per day, or for 42 h or more per week.

3.2.2. Empirical model

In order to define factors associated with child labor, we conducted the following model.

$$Y = \beta_0 + \beta_{1i}X_{1i} + \beta_{2i}X_{2i} + u_i \quad (1)$$

where

- Y is either i) working status; ii) the number of working hours; or iii) types of economic activities of a child aged 6–17;
- X_{1i} is a matrix of a child's individual characteristics;
- X_{2i} is a matrix of a child's household characteristics; and
- u_1 is error term, which was assumed to be normally distributed.

For the binary dependent variable Y (such as working status and type of work), a logistic regression model was applied to detect the possible impact of children's individual and family characteristics on the dependent variables. For the continuous dependent variable Y (i.e., the

number of working hours), an ordinary least square (OLS) regression model was utilized to evaluate the influences of individual and household factors.

3.2.3. Description of variables

Dependent variables:

- Child's work status: In order to examine the determinants of child labor, it is essential to consider the effects of those factors on the probability that a child aged 6–17 participated in labor market. In this study, the information regarding child work status was collected the question: "Do Mr./Ms. currently have a job?" The VHLSS 2012 marked the answer with two options: "Yes" or "No".
- Child's number of working hours: In this study, from the data on average daily working hours and monthly working days, we could calculate the monthly number of working hours for a child who reported "currently having a job" as above.
- Child's types of economic activities: For this study, the types of economic activities engaged by child laborers included i) wage/salary-paid jobs; ii) self-employed in agricultural works, and iii) jobs in non-agricultural businesses.

Independent variables:

- Age (of child laborer): In this study, age was a continuous variable. In addition, in the regression model, we also used age-squared (age^2) in order to see whether a revert relationship between age and child labor existed.
- Sex (of child laborer): In this study, gender was categorized into male and female.
- Education (of child laborer): In this study, the highest educational level of a child worker was used to measure his/her education.
- Residential area: In this study, residential area was categorized into urban and rural area.
- Ethnicity: We categorized children into two ethnic groups, including Kinh and non-Kinh (or ethnic minorities).
- Household size: The number of household members at the time of survey.
- Household's per-capita expenditure: This was calculated by dividing the total household expenditure by the number of household members (or household size).
- Age and Sex of the household head: The same as above, age of the household head was a continuous variable, while his/her sex was categorized into male and female. Moreover, age squared (age^2) of the household head was also added in the model.
- Education of household adults, and the number of working adults: The same as above, education of each adult in the household was presented by his/her highest education level. The number of working adults was the total number of adults who were working at the time of survey.
- Credit status of household: This variable was presented by any preferential loan that a household got from official financial institutions (such as banks and credit funds).

Table 1
Independent variables.

Individual Characteristics	Household Characteristics
Age (of child laborer)	Household size
Age squared (of child laborer)	Household's per-capita expenditure
Gender (of child laborer)	Age (of household head)
Education (of child laborer)	Age squared (of household head)
Residential area	Gender (of household head)
Ethnicity	Education (of household adults)
	Number of working adults
	Credit status of household

The independent variables for our estimations are presented in Table 1.

4. Results

4.1. Situation of child labor in Vietnam

Since *Doi Moi* (economic renovation) in 1986, the Vietnamese economy has switched from a centrally-planned economy to the socialist-oriented market one. The Government of Vietnam has made great efforts in improving the national living standard in general, and the children development in particular. Although the country has gained a large number of achievements in child protection and care, the development of young generation has been negatively affected by inequalities in economic growth as well as the widening living gap between areas and communities. In contrast to the economic achievements, there have been an increasing number of children living in poor conditions or must work at their early ages.

Table 2 presents a statistical description of the child labor situation in Vietnam, based on the data of VHLSS 2012. The VHLSS had 7,426 children aged 6–17, of which 721 children (or 9.7% of the surveyed children) were child laborers. By age group, those aged 15–17 accounted for nearly 60% of the child labor force. In terms of gender, Vietnamese boys tended to join the labor force more than did girls (55.48% vs. 44.52%, respectively). The majority of child laborers were from rural areas (accounting for 86.82% of the total). Regarding ethnicity, Kinh children also accounted for nearly half of the child laborers.

Table 3 shows the number of working hours per month by child laborers. It indicated that those aged 15–17 worked for longer hours than did those in the other two groups. At the highest ranges of working hours (i.e., 96 to less than 168 h, and 168 h and above), the 15–17 group always accounted for the majority. In contrast, those aged 6–11 often worked for less than 96 h per month, while those aged 12–14 tended to work for 96 to less than 168 h per month. As defined in the VNSCL 2012, working for more than 42 h per week (or 168 h per month) was considered as long working, and thus 60.19% of child workers in VHLSS 2012 sample were considered to have long working.

By gender, the data indicated that male child laborers were overwhelmed their female counterparts in both participation rate (as discussed above) and the number of working hours (55.48% vs. 44.54%, respectively, for monthly working with 168 h and above). Similar observations were for children living in rural and urban areas.

In terms of ethnicity, Kinh child laborers were not dominated in the labor market, but they had slightly higher proportion to work 168 h and above per month than did children in other ethnic groups (30.24% vs. 29.96%, respectively).

Table 4 presents monthly income for child laborers. Among 721 child laborers, 419 children (or about 58%) worked unpaid, of which 30% of boys and 28% of girls worked without income. It is interesting to observe that boys were more active in labor market, but their earnings were not as high as those of girls. In addition, the proportion of boys whose income was at the highest threshold was also lower than that of girls (0.28% vs. 0.42%, respectively, for earning more than VND 4,500,000 per month).

Regarding living area, 3.74% urban child workers worked without being paid, compared with 54.37% for their rural counterparts. For ethnicity, Kinh child workers had much less proportion of being unpaid than that of ethnic minority counterparts (13.31% vs. 44.80%, respectively).

Table 5 presents different types of economic activities among child workers. In terms of age, the majority of those aged 6–11 worked as self-employed in agriculture sector (91.74%), while that for those aged 15–17 worked for wage/salary (60.99%). Regarding gender, self-employed in agriculture sector was dominated category for both working boys and girls (71.75% and 68.85%, respectively). The majority of urban and Kinh child workers did the paid jobs (71.58% and 69.78%,

Table 2
Child labor by age groups, gender, area and ethnic group.

Total	Age group			Gender		Area		Ethnic group	
	6–11	12–14	15–17	Male	Female	Urban	Rural	Kinh	Other
721	121	177	423	400	321	95	626	321	400
100%	16.78	24.55	58.67	55.48	44.52	13.18	86.82	44.52	55.48

Source: Own calculations from VHLSS 2012.

Table 3
Child laborers' monthly working hours by age groups, gender, area and ethnicity (%).

Working hours	Age group			Gender		Area		Ethnic group	
	6–11	12–14	15–17	Male	Female	Urban	Rural	Kinh	Others
<=20	4.16	0.69	0.42	2.77	2.50	0.14	5.13	1.94	3.33
20–<=96	8.74	6.10	2.64	9.85	7.63	1.25	16.23	4.85	12.62
96–<=168	1.80	5.69	9.57	10.82	6.24	2.08	14.98	7.49	9.57
>168	2.08	12.07	46.05	32.04	28.16	9.71	50.49	30.24	29.96
No. of obs.	121	177	423	400	321	95	626	321	400

Source: Own calculations from VHLSS 2012.

Table 4
Child laborers' monthly income by age groups, gender, area and ethnicity (%).

Income (VND 1,000)	Age group			Gender		Area		Ethnic group	
	6–11	12–14	15–17	Male	Female	Urban	Rural	Kinh	Others
Unpaid	16.23	19.00	22.88	30.10	28.02	3.74	54.37	13.31	44.80
<=500	0.14	2.77	7.21	6.38	3.74	1.53	8.60	4.85	5.27
500–<=1,500	0.42	1.80	14.56	10.12	6.66	2.91	13.87	12.62	4.16
1,500–<=2,500	0.00	0.83	6.80	4.99	2.64	2.36	5.27	6.66	0.97
2,500–<=3,500	0.00	0.00	4.30	2.36	1.94	1.39	2.91	4.30	0.00
3,500–<=4,500	0.00	0.14	2.22	1.25	1.11	0.97	1.39	2.08	0.28
>4,500	0.00	0.00	0.69	0.28	0.42	0.28	0.42	0.69	0.00
No. of obs.	121	177	423	400	321	95	626	321	400

Source: Own calculations from VHLSS 2012.

Table 5
Child laborers' type of economic activities by age groups, gender, area and ethnic group (%).

Economic Activities	Characteristics								
	Age group			Gender		Area		Ethnic group	
	6–11	12–14	15–17	Male	Female	Urban	Rural	Kinh	Others
Work for family agriculture	91.74	83.05	59.10	71.75	68.85	32.63	76.20	42.37	93.00
Work for wage	2.48	22.03	60.99	45.50	36.76	71.58	37.06	69.78	19.00
Work for family business	8.26	4.52	4.26	2.75	7.79	10.53	4.15	6.23	4.00
No. of obs.	121	177	423	400	321	95	626	321	400

Source: Own calculations from VHLSS 2012.

respectively).

4.2. Determinants of child labor in Vietnam

Prior to examine the determinants of child labor in Vietnam, we used a binary logistic model to identify the impacts of individual and family characteristics on probability to work for children aged 6–17 (Table 6).

Regarding age, the coefficient of variable "age" was positive and statistically significant, while that of variable "age^2" was negative and statistically significant. These meant that older children had higher probability to participate in the labor market than did the younger ones, but their participation tended to decrease at higher ages.

There was also a statistically significant relationship between gender and working status of child aged 6–17. In particular, male participation rate was higher than that of female.

The results also indicated that education, ethnicity, and residential area had statistically significant relations with probability that children aged 6–17 engaged in economic activities. Children with better education level had 30% lower probability to work than those with lower education level. This reflected a trade-off between participating in labor markets and going to schools. Normally, children who went to work early could not continue their study and their highest educational level was inversely related to their participation in job markets.

Regarding ethnic groups, the regression results showed a negative and statistically significant link between Kinh children with working status. It was clear that Kinh children were usually in the better socio-economic status groups, so that working was not a choice.

A negative and statistically significant relationship between children from urban area and working status was also presented. Thus, children aged 6–17 living in urban area were less likely to participate in labor markets than were their rural counterparts. The key reason for these findings was that urban children were usually in better-income groups than their rural counterparts.

In regard to family characteristics, the result indicated a negative

Table 6
Determinants of working status and working hours of children aged 6–17.

	Working status *Logit*	Working hours *OLS*
Individual characteristics		
Age	1.120***	1.922
	(0.149)	(2.049)
Age²	−0.0131**	0.997***
	(0.00557)	(0.0812)
Gender		
Female (ref.)		
Male	0.178**	2.866*
	(0.0822)	(1.671)
Education	−0.300***	−19.50***
	(0.0280)	(1.313)
Ethnic Groups		
Others (ref.)		
Kinh	−1.443***	−26.68***
	(0.102)	(2.956)
Residential Area		
Rural (ref.)		
Urban	−0.484***	−3.005*
	(0.121)	(1.781)
Family characteristics		
Household size	−0.0908**	−1.980**
	(0.0361)	(0.956)
Log of household real expenditure per capita	−0.550***	−2.678
	(0.0961)	(1.837)
Household head- Age	−0.0308	0.00525
	(0.0256)	(0.568)
Household head- Age²	0.000308	0.00121
	(0.000238)	(0.00527)
Household head- Gender		
Female (ref.)		
Male	−0.145	−2.347
	(0.118)	(2.237)
Household- Highest level of education	−0.318***	−1.358***
	(0.0454)	(0.282)
No. of working adults	0.212***	4.173***
	(0.0594)	(1.486)
Credit Status	0.283***	5.162
	(0.103)	(3.190)
Constant	−4.645***	5.265
	(1.387)	(24.50)
Observations	7,403	7,403
R-squared		0.283

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; (ref.) denotes the reference groups. Standard deviations are in parentheses.
Source: Own calculations, using VHLSS 2012.

link between "Household size" and probability for a child aged 6–17 to be engaged in economic activities. At 5% significance level, children from small households tended to work for longer hours than those from bigger ones. It was shown that children from bigger-size families had 9.08% lower probability to get involved in economic activities than did those from smaller-sized families. This result could be explained by the shortage of labor supply in smaller families, so that children might be encouraged to work.

Household's per-capita expenditure had adverse effect on a child's involvement in economic activities, as the coefficient was negative and statistically significant at 1% significance level. Household's per-capita expenditure represented household wealth, and thus such a finding showed that a wealthier family could reduce 55% probability of working for its child(ren).

The results for household head characteristics showed that age and gender did not have influence on the probability for a child to participate in economic activities.

There was a negative correlation between the education level of household (defined by the highest educational level of household members) and working status of children aged 6–17. At 1% significance level, it could be inferred from the regression results that education level was a decisive factor in the probability that a child involved in economic activities. The higher household education level was, the lower probability for children aged 6–17 was reported as "currently having a job".

Interestingly, the number of working adults and credit status of household showed positive and statistically significant impacts at 1% significance level. Such results implied that a household having a higher number of economically-active adults had 21.2% higher probability for children aged 6–17 to work. The positive relationship between preferential loan and children's involvement in economic activities could be explained by the fact that labor shortage might occur when the families utilized credit to expand their production or business activities.

Table 6 also presents the results of OLS estimates for the number of working hours. Regarding individual characteristics, the results implied a stronger influence of male on children's working hours than that of female (as the variable "Gender" was statistically significant at 10% significance level). If a child's education increased by one level, their number of working hours reduced by 19.5. At significance level of 1% and 10% respectively, two variables "Ethnic Groups" and "Residential Area" were negatively correlated with children's number of working hours. For ethnicity, similar to the logistic regression results on children aged 6–17 as discussed above, the impacts of Kinh children and urban children on working hours were not as forceful as the impacts of their respective ethnic minority and rural counterparts.

Regarding household characteristics, "Household Size", "Household head's highest educational level" and "the number of working adults" were statistically significant and positively linked with children's number of working hours. At 5% significance level, if household size increased by one person, the number of monthly working hours of children reduced by 1.98.

Educational level of household head was negatively correlated with the number of working hours of children. At 1% significance level, if household head's educational level increased by one level, the children decreased 1.36 h of work. There was also a positive and statistically significant relationship between the number of working adults and the number of working hours of children: if the number of working adults increased by one person, the number of working hours of children increased by 4.17 h per month.

Table 7 presents the factors affecting economic sectors which children were working. In terms of individual characteristics, age, education, ethnicity and residential area showed statistically significant influences on the probability that a child laborer was engaged in self-employed in agriculture and/or paid jobs. Interestingly, Table 7 inferred that, as a child got older, it was more likely that he/she worked for wage/salary jobs than other types of work.

The results also showed that children with higher educational levels tended to work as self-employed in agriculture, while those with lower educational levels tended to have wage/salary jobs.

While the impact of living in urban area was stronger than living in rural area for children engaging in working for wage/salary jobs or self-employed in agriculture, the influence of urban area was not as significant as rural area for children who worked on non-agriculture work.

Regarding household characteristics, household head's age and education level showed influence on economic activities of child workers, but not all activities. At 5% significance level, the probability that child workers having a wage/salary job was lowered by 14% if household heads was at more advanced ages. Household head's age was positively correlated with the probability that a child laborer worked for family business (both agriculture and non-agriculture work).

Moreover, at 10% significance level, children from male-headed households tended to be engaged in agricultural activities. Table 7 showed that the highest education level of the household head had a positive relationship with 31.2% increase in the probability that a child had a wage/salary job, and a negative link with 40.5% reduction in the probability that a child had a wage/salary job. The other household characteristics, such as household size and credit status, were not

Table 7
Determinants of economic activities of child laborers.

	Self-employed in agriculture *Logit*	Wage/salary jobs *Logit*	Non-agriculture jobs *Logit*
Individual characteristics			
Age	−1.541**	2.916***	0.0575
	(0.695)	(0.942)	(0.642)
Age^2	0.0435*	−0.0784**	−0.0113
	(0.0245)	(0.0321)	(0.0242)
Gender			
Female (ref.)			
Male	0.449**	0.367*	−1.136***
	(0.229)	(0.214)	(0.397)
Education	0.156***	−0.112**	0.0578
	(0.0549)	(0.0492)	(0.105)
Ethnic Groups			
Others (ref.)			
Kinh	−2.693***	2.094***	0.0913
	(0.290)	(0.246)	(0.425)
Residential Area			
Rural (ref.)			
Urban	−1.364***	0.815**	0.605
	(0.330)	(0.350)	(0.490)
Household size	−0.0928	−0.0639	0.0350
	(0.0943)	(0.0846)	(0.158)
Log of household real expenditure per capita	−0.878***	0.630**	0.944**
	(0.296)	(0.274)	(0.438)
Household head- Age	−0.0320	−0.140**	0.356**
	(0.0657)	(0.0644)	(0.156)
Household head- Age squared	8.64e-05	0.00158**	−0.00299**
	(0.000610)	(0.000634)	(0.00148)
Household head- Gender			
Female (ref.)			
Male	0.501*	−0.458	0.287
	(0.299)	(0.302)	(0.533)
Household-Best education	0.312**	−0.405***	−0.111
	(0.138)	(0.142)	(0.218)
No. of working adults	0.153	−0.121	−0.250
	(0.148)	(0.140)	(0.255)
Credit Status	0.281	0.177	−0.696
	(0.299)	(0.260)	(0.566)
Constant	23.10***	−27.88***	−19.45***
	(5.904)	(7.345)	(6.643)
Observations	710	710	710
R-squared			

Notes: Standard errors in parentheses; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$
Source: Own calculations, using VHLSS 2012.

statistically significant with all types of economic activities.

5. Discussion and policy recommendations

The current child labor situation in Vietnam should be alerted with about 9.7% of children aged 6–17 were child laborers in 2012. This finding was quite similar with that from Edmonds and Tuck (2002). It is implied from our analyses that the Vietnamese children not only started working at young ages but also worked for long hours. The inequalities in terms of gender, residential area, ethnicity were clearly observed, and thus government's attention and law implementation are significantly important. From the above findings, there should be several policies on child protection and child labor improvement, as follows.

Although legal regulations on child labor have been established and implemented in Vietnam, and the government has been proactive in participating in international commitments on children and child labor, the existing legal regulations should be reviewed and supplemented with more strict regulations and penalties on child labor users. In addition, all businesses should be inspected regularly to detect and fine on any infringements on child labor. Moreover, it is expected that the National Assembly will pass government's proposal to raise the children's age limit to below 18 in the revised Law on Children Protection, Care and Education. It is believed that a raise in legal regulation on children's age limit will encourage legal protection on children in general, and child laborers in particular.

Additionally, households, especially rural and ethnic minority ones, should be propagandized about child labor and its negative impact on children development and future. The enhancement of public awareness on child labor should be concentrated. Public education should not be provided solely for children but also for others household members, especially parents of child laborers. The results from this study showed that education would be an effective tool for child labor prevention.

It is important that conditions, especially conditions on child education, should be added before granting preferential credits to household with difficulties. As a result, the situation in which households take advantage of children to compensate for labor shortage can be avoided. The solvency of child labor should be accompanied with solutions for other economic and social issues. In other words, child labor prevention should be integrated into development pathways. Programs on rural economic development, economic improvement in remote areas have been implemented for years with major achievements, but preferential development programs for difficult areas should be strongly encouraged, and resources should be actively mobilized not only from local groups but also from international partners.

Finally, educational and/or vocational programs to support child workers as well as a healthcare programs to support child laborers physically and spiritually should be implemented, so that the child laborers will have opportunities for a brighter future.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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