94
Working Paper

Young Lives
An International Study of Childhood Poverty

Shocks, Borrowing Constraints and Schooling in Rural Vietnam

Nguyen Tien Dung

www.younglives.org.uk

MARCH 2013

Working Paper 94

Young Lives
An International Study of Childhood Poverty

Shocks, Borrowing Constraints and Schooling in Rural Vietnam

Nguyen Tien Dung

www.younglives.org.uk

MARCH 2013

Shocks, Borrowing Constraints and Schooling in Rural Vietnam

Nguyen Tien Dung

First published by Young Lives in March 2013

ISBN: 978-1-909403-07-9

A catalogue record for this publication is available from the British Library.

Printed on FSC-certified paper from traceable and sustainable sources.

Funded by

UKaid
from the British people

Ministry of Foreign Affairs of the Netherlands

Young Lives, Oxford Department of International Development (ODID), University of Oxford, Queen Elizabeth House, 3 Mansfield Road, Oxford OX1 3TB, UK

Tel: +44 (0)1865 281751 • E-mail: younglives@younglives.org.uk

Contents

Abstract

In this paper, we have used a longitudinal database of Vietnamese children to investigate the impact of crop and health shocks on child education in rural Vietnam. We explicitly take into account borrowing constraints and investigate the different effects of shocks on constrained and non-constrained households. Our empirical analysis provides further evidence on the role of borrowing constraints in transmitting the effect of shocks. While non-constrained households are able to smooth away the adverse effect of shocks without any consequences for child education, the effect of shocks falls disproportionately on children from borrowing-constrained households, which have limited ability to cope with temporary income losses. We find that shocks can affect both the quantity and quality of education, especially for children from poor and constrained households. Shock-affected households not only withdraw children from school, but they also sharply reduce their spending on child education and decrease children's study time out of school. The reductions in educational expenditure and study time may affect children's performance at school and are likely to cause grade repetition and leaving school early.

Acknowledgements

I wish to thank John Knight for providing useful comments and insights on an earlier draft of this paper. I am grateful to Le Thuc Duc and Laure Pasquier-Doumer for their valuable comments and suggestions at different stages of this research. The editorial assistance from Isabel Tucker is gratefully acknowledged.

The Author

Nguyen Tien Dung is a lecturer in the Faculty of International Economics and Business, College of Economics, Vietnam National University, Hanoi. His research is mainly concerned with the impacts of globalisation on poverty, and income distribution and economic growth in Vietnam. He holds a PhD in International Development from Nagoya University, Japan.

About Young Lives

Young Lives is an international study of childhood poverty, following the lives of 12,000 children in 4 countries (Ethiopia, India, Peru and Vietnam) over 15 years. **www.younglives.org.uk**

Young Lives is funded from 2001 to 2017 by UK aid from the Department for International Development (DFID), and co-funded by the Netherlands Ministry of Foreign Affairs from 2010 to 2014.

The views expressed are those of the author(s). They are not necessarily those of, or endorsed by, Young Lives, the University of Oxford, DFID or other funders.

1. Introduction

Shocks and adverse events can lead to a loss of income and assets, and keep shock-affected households in poverty or make non-poor households poor. Children, especially those from poor households, are among the groups most vulnerable to the effects of economic and environmental shocks. Shocks and adverse events occurring in early childhood can lead to under-nutrition and affect children's cognitive skills and ability, which in turn affect educational performance, resulting in bad job prospects in adulthood. Economic and environmental shocks can seriously affect children not only in early childhood but also in their later educational development. Children may be forced to join the labour force or drop out of school. Spending on education may be cut at the household level as well as at the national level, thus affecting the quality of the education children receive.

A variety of factors influence the extent to which shocks affect educational outcomes, such as the nature and magnitude of the shocks, the level of savings and buffer assets households possess, and household and child characteristics. Even with somewhat mixed evidence, empirical studies conducted in different countries have shown that shocks can have negative impacts on child education in low-income countries. Poor households with limited ability to insure against shocks through credit or savings are forced to cut their investment in education or withdraw their children from school and send them to work to cope with shocks and adverse events.

Vietnam has achieved rapid economic growth over the last two decades. Thanks to this broad-based economic growth, living standards have significantly improved for the majority of Vietnamese people. Income per capita has increased more than five times during this period, turning Vietnam from one of the poorest countries in the world in the early 1990s into a lower-middle-income country. The proportion of the population living below the poverty line fell sharply from nearly 60 per cent in 1993 to around 10 per cent in 2010. Progress has been made in the field of education. Vietnam has a relatively high level of literacy and school attendance compared to other countries of similar income levels. However, concern has grown about the quality of education and about equality of access (Pham and Jones 2010). While universal primary school enrolment has been almost achieved, enrolment rates remain low at secondary and upper-secondary levels, especially for rural and poor children (Nguyen Ngoc P. 2008).

Partly because of the global economic downturn, Vietnam's economy has slowed down considerably in recent years. The rate of economic growth has fallen since 2008, and at the same time inflation has been rising. The deteriorating economic situation has affected several different segments of the population, and poor and rural households in particular. In addition to the rising economic instability, outbreaks of disease and adverse climate events have increased households' vulnerability and exposure to risks, and an increasing number of households have reportedly been affected by economic and environmental shocks.

In this paper, we make use of Young Lives survey data to investigate the impact of crop and health shocks on child education in rural Vietnam.[1] These shocks are among the most common shocks in the rural economy and they have a profound impact on the livelihoods of

1 Young Lives is a 15-year study of childhood poverty in four developing countries: Ethiopia, India (in the state of Andhra Pradesh), Peru and Vietnam. More information about Young Lives and the data used in this paper is given in Section 3.

many rural households. We employ an indicator of households' short-term financing abilities to measure the extent of borrowing constraints, explicitly take into account borrowing constraints and investigate the different effects of shocks on constrained and non-constrained households. The results provide further evidence on the role of borrowing constraints in transmitting the effect of shocks. While non-constrained households are able to smooth the adverse effect of shocks without any consequences for child education, children from poor households with limited ability to cope with temporary income losses are disproportionately affected by them. Shocks not only increase school drop-out in poor and constrained households, but they also reduce educational expenditure and children's study time out of school.

The remainder of the paper is organised as follows. In Section 2, we present a brief review of the empirical literature on shocks and education, with a focus on the impacts of transitory income shocks under the presence of borrowing constraints. It is followed in Section 3 by a discussion of the Young Lives survey data from Rounds 2 and 3 and the trends in child education, shocks and adverse events they reveal. The identification strategy is discussed in Section 4, and the empirical results are presented and discussed in Section 5. Section 6 summarises the findings and makes some concluding remarks.

2. Literature review

There is a large and growing literature on the relationship between shocks and child education. Empirical studies have been conducted in different countries to investigate the impacts of different shocks and adverse events on the welfare of households and their children, including economic crises, relative price changes, natural disasters, diseases, climate shocks, and idiosyncratic shocks such as death or illness of breadwinners (Funkhouser 1999; Duryea 1998; Ferreira and Schady 2008; Grimm 2008; Cogneau and Jedwab 2010; Senne 2010; Nguyen Viet Cuong and Mont 2011; and Thai and Evangelos 2011). Most of these studies have found that shocks had substantial impacts on child education, including increased drop-out from school, reduced educational expenditure and increased child labour. However, the adverse effect of shocks does not always translate into adverse educational outcomes. In a survey of aggregate shocks and child education, Ferreira and Schady (2008) have pointed out that the impacts of shocks varies considerably across countries. Shocks have strong adverse impacts on education in low-income countries, but they only have small or even counter-cyclical impacts in middle-income and high-income countries.[2]

Recent studies have paid increasing attention to the impact of transitory income shocks in the presence of borrowing constraints. If households can borrow to cope with shocks, or if they can use savings or rely on other institutional arrangements, they can smooth consumption against temporary income fluctuations. Consumption smoothing is, however, not complete, especially in poor developing countries, where capital markets are underdeveloped and poor households with limited savings and assets have limited capability to smooth consumption. Kazianga and Udry (2006) investigate the impacts of shocks on

2 Ferreira and Schady (2008: 39, Table 4) show that the schooling outcomes are counter-cyclical in Brazil and Mexico (upper-middle-income countries), but strong pro-cyclical Malawi and Côte d'Ivoire (low-income countries). For Indonesia and Peru, which lie between the above groups, the impacts of shocks on school enrolment are negative but generally small.

consumption in rural Burkina Faso and find little evidence of consumption smoothing across households or over time. Consumption closely tracked the fluctuation in income induced by rainfall variations. Furthermore, animal selling and risk-sharing mechanisms were not effective in insulating consumption from income fluctuations, and limited consumption smoothing was largely effected through the accumulation and depletion of grain stocks. Fafchamps et al. (1996) find a weak and often not statistically significant relationship between shocks and animal selling, indicating the limited role of livestock as a buffer stock.

Incomplete consumption smoothing indicates the existence of borrowing constraints or absence of savings. Borrowing constraints raise the opportunity cost of schooling and affect household investment in human capital. Jacoby (1994) investigates the impacts of borrowing constraints on school progression in Peru and shows that children from wealthier households with higher income and more durable goods are less likely to repeat grades at school. Guarcello et al. (2002) investigate the impacts of shocks and credit rationing on child work and education in Guatemala. The study shows that borrowing constraints have a strong impact on households' decisions to invest in human capital but are less relevant to households' supply of child labour. Credit-rationed households are more likely to withdraw their children from school, but not necessarily more likely to send them to work. Unlike credit rationing, covariate and individual shocks directly affect child work. Shock-affected households tend to make their children do more work while keeping them in school, in order to compensate for unexpected income losses.

Beegle et al. (2006) examine the links between crop shocks, child labour and borrowing constraints in Tanzania. More specifically, they investigate the role of asset holdings in translating shocks into child labour and educational outcomes. They find that shocks significantly increase child work and reduce school attendance. On average, children from shock-affected households work 30 per cent more, and they are 20 percentage points less likely to be enrolled in school. However, the negative impacts of shocks are mostly offset by asset holdings, indicating that households can use their assets as buffer stock or as collateral for borrowing. Beegle et al. (2006) also find that rich households tend to borrow to insure against crop shocks whereas poor households have to reduce their asset holdings.

In a study of northern Mali, Dillon (2008) finds that large crop shocks and sickness in adult females significantly increase the probability of children being withdrawn from school. He examines the role of assets as an insurance mechanism against shocks and shows that the effect on child labour and schooling varies with different types of assets and shocks. Households with a larger holding of livestock are less likely to pull children out of school when they face large or small crop shocks, but their children tend to do more paid work as well as participate in home production activities. Meanwhile, households with a larger holding of agricultural capital are more likely to withdraw children from school when they face a large crop shock, but school attenders from these households tend to do less paid and unpaid work.

Some research follows the transitory income approach, as proposed in Paxson (1992), to investigate the link between temporary income losses and children's educational performance. Gubert and Robillard (2006) analyse the impact of crop shocks on schooling decisions in rural Madagascar. They estimate the effect of shocks on household income and use this exogenous measure of transient income shocks to investigate schooling decisions. Their empirical results show that transitory shocks significantly increase the probability of children dropping out of school. In a similar study of rural Pakistan, Sawada (2003) finds that transitory income is positively correlated with school attendance but negatively correlated

with school drop-out, suggesting that borrowing-constrained households reduce investment in education and withdraw their children from school to cope with shocks.

Shocks do not only affect school attendance, but also children's educational performance. Escobal et al. (2005) analyse the impacts of economic shocks on the quantity and quality of child education using the Peruvian Living Standard Measurements Study data. Using different measures of short-term economic shocks, this study shows that economic shocks have no robust effect on the quantity of education, defined as the additional over-age years of schooling. However, short-term shocks significantly reduce households' education expenditure, and thus they can affect the quality of education.

Once children are withdrawn from school, it is difficult for them to re-enter. This implies that the educational consequences of a shock can be long-lasting even when the shock is transitory. Using 13-year panel data for Tanzania, Krutikova (2010) investigates the long-term consequences of crop shocks. This study finds that crop shocks have permanent effects on children's education, especially for older girls and younger boys. The increase in child labour as a short-term response to crop shocks partly accounts for the long-term effects on child education.

The literature reviewed above makes it clear that borrowing constraints have a key role in determining the educational consequences of shocks. Except for some empirical studies that take into account the role of assets in mitigating the effect of shocks, the research on shocks and education in developing countries often assumes households are facing borrowing constraints to some degree. This way of treatment can be appropriate in very poor countries, where most people are living in poverty. However, in middle-income countries like Vietnam, borrowing constraints may not be binding for certain segments of the population, and shocks may have different effects on households, depending on their ability to smooth consumption. Thus, it is necessary to take into consideration the differences in households' coping capabilities in investigating the educational consequences of shocks. This is done in our analysis as discussed in the next section.

3. Data

This analysis makes use of data from the Young Lives survey, a longitudinal study of child poverty in four developing countries including Vietnam. We use data from Rounds 2 and 3, conducted in 2006 and 2009. The survey follows 3,000 children in 3,000 households in five regions of Vietnam – the Northern Uplands, Red River Delta, Central Coast, Mekong Delta regions and the city of Da Nang. There are 2,000 children born in 2001–2 in the Younger Cohort, and 1,000 born in 1994–5 in the Older Cohort. Young Lives adopts a sentinel sampling approach, with poor and rural sites being over-represented. In each region, one province is selected, and in each province four communes are selected for interviews. Of the four selected communes in each province, two communes are from the poor group, one from the average, and one from the above average group. The city of Da Nang, which is the only urban area chosen for the survey, is also less developed than other big cities such as Hanoi or Ho Chi Minh City.[3]

3 The Young Lives sample is not nationally representative, but aims to show early trends and problems that are affecting people in particular regions. See Le et al. (2011) and Le et al. (2008) for further discussion of the survey sampling and questionnaire.

This survey contains rich information on child education; household income and consumption; support and information networks; the holding of land, durable goods and productive assets; households' financial situation; and household characteristics. Young Lives also collects information on economic and environmental shocks and adverse events affecting households and their children. Information is also collected on the allocation of time to different activities by children aged between 5 and 17 years old. The information on time use shows how much time the children spend on sleeping, leisure, studying both in and out of school, and working.

We study a sub-sample of rural households and take into account all children aged between 6 and 17, including Young Lives children and their siblings. The two cohorts of Young Lives children were aged 5 and 12 respectively in 2006, and 8 and 15 in 2009. The restriction of child ages is in line with the reality that official schooling begins at 6 years old, and most children have left school by the age of 17. Our analysis focuses on rural households because these households are more vulnerable to shocks owing to their lower capabilities to smooth consumption and the lack of educational facilities in rural areas. The rest of this section will discuss some trends and summary statistics on child education, households' financial situations and shocks and adverse events, using the survey data.

3.1. Education

Table 1 presents summary statistics on child education for the period 2006–9, broken down by age, gender and expenditure groups. Three educational indicators are reported, including drop-out rates, schooling time and study time. Study time is the time spent studying out of school, and schooling time is time spent at school. Around 82 per cent of rural children aged between 6 and 17 years old are reported to be attending school. For the whole sample, an average rural child spends 3.9 hours a day at school and 2.3 hours a day studying outside school. After excluding children who have dropped out of school, an average school attender spends 4.8 hours at school and 2.8 hours studying outside school. Girls do better than boys in terms of schooling, especially at the primary school level. The drop-out rate for girls is 2.9 percentage points lower than that for boys, and girls also have more schooling time and study time than boys. This pattern of schooling in favour of girls is somewhat surprising in the context of rural Vietnam, where families still show a preference for boys.

Table 1. *School drop-out rates and time spent at school and on study at home, by gender, wealth level and age (rural children)*

	School drop-out rate (%) (whole sample)	Whole sample		Sub-sample of school attenders	
		Schooling time (hours)	Study time out of school (hours)	Schooling time (hours)	Study time out of school (hours)
Total	18.3	3.92	2.29	4.80	2.79
Gender					
Boys	19.7	3.86	2.21	4.80	2.74
Girls	16.8	3.99	2.37	4.79	2.85
Expenditure quintiles					
1 (poorest)	34.9	3.04	1.28	4.67	1.96
2	20.1	3.79	2.18	4.74	2.72
3	13.2	4.15	2.53	4.78	2.91
4	11.0	4.32	2.73	4.85	3.07
5 (richest)	7.4	4.61	3.05	4.97	3.28
Age					
6	14.6	3.80	1.64	4.45	1.92
7	7.5	4.48	2.06	4.84	2.22
8	3.5	4.46	2.64	4.63	2.73
9	8.7	4.08	2.14	4.47	2.32
10	9.9	4.14	2.20	4.59	2.44
11	9.6	4.21	2.46	4.66	2.72
12	10.8	4.18	2.33	4.68	2.61
13	20.0	3.98	2.39	4.98	2.97
14	24.5	3.88	2.46	5.14	3.22
15	36.0	3.39	2.37	5.29	3.69
16	52.0	2.48	1.71	5.18	3.54
17	55.0	2.43	1.89	5.41	4.20

As can be seen in Table 1, the school drop-out rate is low at the primary level.[4] The drop-out rate declines between the age of 6 and 8 reflecting the late school enrolment. After the age of 8, the drop-out rate starts to rise, and it increases sharply after the age of 12. By age of 17, 55 per cent of rural children have left school. A sharply declining trend in schooling time and study time out of school is also observed for children of secondary and upper-secondary school ages but this is caused by the decrease in school attendance. For school attenders, schooling time and study time out of school increase respectively from 4.5 and 1.9 hours at the age of 6 to 5.4 hours and 4.2 hours at the age of 17.

There are several reasons for the observed decline in school attendance. Firstly, primary school is free, but tuition fees are payable at the secondary and upper-secondary levels, and students are often required to pay additional contributions to the school (Pham and Jones 2010).[5] Secondly, there are fewer secondary and upper-secondary schools in Vietnam, and children may have to travel a long way to get to school, especially in the more rural and mountainous regions. Finally, the opportunity cost of schooling increases as children get older, which induces families to gradually withdraw children from school.

4 Formal education in Vietnam is divided into three levels: primary, secondary and upper secondary. Primary education normally begins at the age of 6 and lasts until the age of 11, consisting of Grades 1 to 5. Secondary education and upper-secondary education begin at the ages of 11 and 15 respectively. The secondary level has four grades (6, 7, 8, and 9), and the upper-secondary level has three (Grades 10, 11 and 12).

5 These additional contributions are decided by the school and can vary greatly across schools and communes.

The average Young Lives household spends around 1.3 million dong (US$62) on child education or 842,000 dong (US$40) per school attender per year. Spending on children's education accounts for 4.7 per cent of total household expenditure and consists of school fees, private tuition fees, payment for books and school stationery, and the cost of transportation and uniforms. School fees consist of registration and examination fees and donations to the school, whereas private tuition fees consist of payment for extra classes and private tutors. School fees, private tuition fees and the payment for books and school stationery are the major components of educational expenditure, accounting for 28 per cent, 33 per cent and 26 per cent of total expenditure on child education respectively.

There is a sharp difference in child education expenditure across income groups. Rich households invest more in child education than poor households. Children from rich households are more likely to attend school and they also have more study time than do children from poor households. As Table 1 shows, the drop-out rates average nearly 35 per cent for children from households in the first expenditure quintile (the poorest group), but decline to 7 per cent for those from households in the fifth quintile (the richest group). The amount of time spent at school differs only slightly for school attenders from households in different income groups, but the difference in study time out of school is much larger. Children attending school from the richest group spend an average of 3.3 hours on study out of school, which is much higher than the corresponding figure of 2 hours for children from the poorest group.

3.2. Borrowing constraints

Determining the extent of borrowing constraints is a difficult matter. The empirical studies on shocks and child education often use either savings, or the stock of assets and durable goods, or access to credit to estimate the degree of borrowing constraints.[6] However, since households can resort to different mechanisms to protect their consumption against income fluctuations, and coping strategies can vary across households, using access to credit and asset holdings does not fully capture households' coping capability. Information is available from the Young Lives survey to capture better households' ability to smooth consumption through different coping strategies. The survey contains a question in which households are asked if they could raise a certain amount of money by doing extra work, using savings, selling assets, borrowing from official and unofficial sources, or receiving support from relatives or friends.[7] The affirmative response to this question indicates that the household has the ability to smooth consumption against temporary income fluctuations. By contrast, households that are uncertain that they could raise the money, or could not do so, may have some kind of financing difficulty. We consider these households as borrowing-constrained in the sense that they have a limited ability to finance temporary losses in income.[8]

6 For example, Beegle et al. (2003) and Beegle et al. (2006) use the stock of durable goods and productive assets as a proxy for households' access to credit. Jacoby (1994) estimates the probability of having savings and durable goods and uses these measures to define borrowing-constrained groups. Guarcello et al. (2002) make use of survey information on the availability of credit, interest rates and borrowing conditions to define credit-rationed households.

7 The specified amount of money is 230,000 dong (US$11) for 2006 and 300,000 dong (US$14) in 2009, which is determined as the cost of living in two weeks for a household of four members.

8 It can be argued that households can raise funds not in cash but in kind to finance temporary income losses. However, borrowing or receiving support in kind is not a common practice in rural Vietnam. For example, the value of in-kind support accounts for only 20 per cent of the total support received by rural households from relatives or friends.

According to the criteria set, a large number of households reported borrowing constraints. Moreover, the number with a borrowing constraint increased between 2006 and 2009, probably reflecting the worsening economic situation in the period. In 2006, around 52 per cent of households reported a borrowing constraint, but this proportion increased to more than 64 per cent in 2009. Borrowing constraints are largely reported by low-income households. More than half of the self-reported borrowing-constrained households are poor, defined as being in the first two expenditure quintiles. Another 40 per cent are in the next two quintiles, whereas only a small proportion of households reporting financing difficulties were in the richest quintile.

Table 2 shows the consumption, assets and indebtedness of the households in our sample, grouped according to whether they were constrained and unconstrained. Borrowing-constrained households have a lower average per capita consumption, and they report debt problems more frequently. There is a sharp difference between households with and without borrowing constraints in their level of wealth. The productive assets of borrowing-constrained households are less than one-fifth of those of unconstrained households. Similarly, borrowing-constrained households hold durables of less than half the value of those held by unconstrained households. The low level of asset holdings in the constrained households implies that these households have limited ability to use their assets as a buffer stock or as collateral for borrowing.

Table 2. *Constrained and non-constrained households*

Mean of variables	Non-constrained households	Constrained households
Per capita consumption (000s of dong)	6,349.00	4,860.14
Indebtedness (serious debt problem = 1)	0.54	0.63
Productive assets (000s of dong)	17,290.96	3,360.03
Value of durables (000s of dong)	16,276.35	7,676.13
Area of agricultural land (m^2)	4,279.92	4,981.24
Household size (number of persons)	5.24	5.51

Table 3 reports the estimation results for the probability of a household reporting borrowing constraints, conditional on a set of household characteristics: per capita consumption, the value of productive assets and durable goods, the size of land, households' indebtedness and household size. As expected, the probability of a household reporting borrowing constraints is strongly correlated with income per capita, productive assets and durable goods. Lower-income, less wealthy, and more indebted households are more likely to report borrowing constraints. However, the area of agricultural land has no significant effect, partly because of relatively equal land distribution in rural Vietnam. In addition, the thin market for land and the restricted transaction of land limit the use of land as collateral for borrowing or a buffer stock.[9]

9 According to the World Bank (2003), following the decollectivisation in the late 1980s, cooperative land was redistributed to households in an equitable manner, which took into account the number of household members able to provide labour, as well as historical land ownership. Ravallion and van de Walle (2008) reported that, even though there are no legal restrictions on land transfers, transfers of land have been limited by the ambiguity of the country's laws and the intervention of local government for the purpose of equity.

Table 3. *Probability of reporting borrowing constraints*

	Marginal effects
Round dummy	0.241***
(Round 3 = 1)	(0.02)
Per capita consumption	−0.237***
(log value of per capita consumption)	(0.02)
Indebtedness	0.082***
(serious debt problem = 1)	(0.02)
Productive assets	−0.018***
(log value of productive assets)	(0.00)
Durable goods	−0.080***
(log value of durables)	(0.01)
Agricultural land	0.004*
(log area of agricultural land)	(0.00)
Household size	−0.015***
(number of household members)	(0.00)
Number of observations	4,624
Pseudo R^2	0.139
p values	0.000

Standard errors in parentheses;
* Significant at 10%; ** significant at 5%; *** significant at 1%.

3.3. Shocks and adverse events

The Young Lives survey includes a module collecting information on the shocks and adverse events that affected households. In each survey round, households were asked if they had suffered from any negative events or shocks that affected their income since the previous survey. A large number of shocks and negative events are specified, covering changes in economic and environmental conditions and other changes that affect household welfare. Economic shocks refer to negative changes in economic conditions such as increases in input prices or decreases in output prices, job losses and the death of animals. Environmental shocks cover adverse climate conditions and their effects, such as frosts, land erosion, storms, floods and drought, and diseases affecting crops, livestock and farm storage. Other negative events consist of the death or illness of household members, theft or fire resulting in the loss of assets, legal disputes regarding debts and contracts, and policies (or unofficial actions by more powerful agents) that adversely affect household welfare, such as compulsory contributions, taxes or bribery. As our analysis focuses on crop failure and health shocks and their impacts on child education, the remainder of this section will give details about these adverse events.

Crops are an important economic activity in rural Vietnam, with almost all rural households engaging in crop farming to some degree. More than 50 per cent of surveyed rural households reported that farming was the most important economic activity of the household, and another 23 per cent of households considered farming as the second most important activity. Rice, other grains, fruit and vegetables are the major crops in rural areas.

Crop failure significantly affected rural households during the two survey rounds we are considering. The data show that crop failure is the most frequent adverse event reported. The incidence of crop failure increased significantly from 15.7 per cent of rural households in 2006 to 20 per cent in 2009.[10] Health shocks, defined as the self-reported illness of the father or mother, are also a commonly reported adverse event among the surveyed households. In 2009, nearly 15 per cent of rural households reported an illness of the father or mother – up slightly from the corresponding figure of 13 per cent in 2006. Health shocks can increase medical expenditure and reduce other household expenditure. Besides that, as fathers and mothers are often the main breadwinners, their illness can cause large income losses and force the household to cut its expenditure or increase child labour.

Crop failures are highly correlated with environmental shocks. This means that households that report a crop failure are likely to report other environmental shocks. The correlation between shocks and adverse events, which are often found in household surveys, partly results from the fact that shocks are classified in arbitrary ways, but it also reflects the causal relationships among shocks (Tesline and Lindert 2004). The high correlation found between crop failure and other environmental shocks suggests that these crop shocks are the consequences of such environmental shocks as crop disease, frosts, floods or drought.[11] By contrast, health shocks are not strongly correlated with other shocks and adverse events.[12]

As a test for the exogeneity of crop and health shocks, Table 4 reports the correlation of crop failure and health shocks with several household characteristics, including the ages of fathers and mothers, the educational achievement of fathers and mothers, household size and an indicator of households' borrowing constraints. The results shows that the probability of reporting a crop failure is positively correlated with household size and older parents, but is negatively correlated with parents' educational attainment and with household borrowing constraints. However, none of these coefficients is statistically significant even at the 10 per cent level.

10 For comparison, animal losses were reported by 11 per cent of rural households in 2009, increases in input prices by 18 per cent, decreases in output prices by 15 per cent, floods by 16 per cent and drought by 10 per cent.

11 Crop failure are strongly correlated with disease, flooding, drought and frosts. The correlation coefficients between crop failure and diseases, frosts, flooding and drought are 0.684, 0.247, 0.327 and 0.324 correspondingly.

12 Health shocks tend to be more correlated with economic shocks such as adverse price changes, job losses or animal deaths, but none of the correlation coefficients between health shocks and other shocks exceeds 0.1.

Table 4. *Probability of reporting crop failure and health shocks*

	Crop shocks	Health shocks
Father's ethnicity	−0.029	0.018
(majority ethnic = 1)	(0.02)	(0.02)
Age of father	0.001	−0.000
	(0.00)	(0.00)
Father's education	−0.002	0.001
(highest grade attained)	(0.00)	(0.00)
Age of mother	0.001	0.004**
	(0.00)	(0.00)
Mother's education	−0.002	−0.006***
(highest grade attained)	(0.00)	(0.00)
Household size	0.005	−0.008**
(number of household members)	(0.00)	(0.00)
Borrowing constraints	−0.012	0.000
(constrained households = 1)	(0.01)	(0.01)
Constants		
Number of observations	3,963	3,963
Pseudo R^2	0.004	0.013
p values	0.047	0.000

Notes: Standard errors in parentheses. All coefficients show marginal effects. dy/dx shows the discrete change from 0 to 1 for dummy variables. * Significant at 10%; ** significant at 5%; *** significant at 1%.

In contrast to crop shocks, health shocks are significantly correlated with some household characteristics. Household size and the educational attainment of mothers are negatively associated with the probability of reporting an illness, indicating that large households or households with educated mothers are less likely to suffer a health shock. The probability of reporting a health shock also increases with the age of the mother. However, the evidence shows that there is not a strong argument for the endogeneity of health shocks, and all these variables will be accounted for later in our empirical analysis.

The self-reported crop failure and health shocks are not only exogenous but transitory at the household level. As shown in Table 5, 639 households, or 28 per cent of rural households, suffered from crop shocks once. Meanwhile, 469 households, or 20 per cent of rural households, reported health shocks once. There is a small proportion of rural households reporting shocks twice during the surveyed period. Only 95 households, or around 4 per cent of total rural households, reported crop failure twice, and only 90 households reported a health shock twice.

Table 5. *Frequency of crop and health shocks*

Number of shocks	Number of households	Percentage	Cumulative percentage
Crop shocks			
0	1,585	68.35	68.35
1	639	27.55	95.90
2	95	4.10	100.00
Health shocks			
0	1,760	75.89	75.89
1	469	20.22	96.12
2	90	3.88	100.00

4. Empirical specification

4.1. Shocks and borrowing constraints

In this section, we present the empirical strategy for assessing the impacts of income shocks on child education in Vietnam. The direct impact of shocks on child education is estimated, controlling for child and household characteristics. The equation for education outcomes is as follows:

$$S_{iht} = \beta_0 + \beta_C X^C_{iht} + \beta_H X^H_{ht} + \beta_S Shock_{ht} + \delta_i + \epsilon_{iht} \quad (1)$$

Here S_{iht} is the educational outcomes for child *i* from household *h* at time *t*. X^C_{iht} is a vector of child characteristics; X^H_{ht} is a vector of household characteristics that influence child educational outcomes; and ϵ_{iht} is the error term. Parameter δ_i is used to capture the fixed effect. In addition to the OLS estimation, we also estimate the equation with household and community fixed effects to account for unobserved characteristics, which may cause a spurious correlation between shocks and educational outcomes.

$Shock_{ht}$ is a dummy variable that is used to capture the occurrence of shocks. The parameter β_S measures the impacts of shocks on educational outcomes. It should be noted that the Young Lives survey covers a wide range of shocks and adverse events, but information is not available for assessing their severity and magnitude. Thus, we simply use dummy variables to measure the effect of the shocks. The crop shock variable takes the value of 1 when a crop failure is recorded, and the health shock variable takes the value of 1 when the household reports an illness of the father or mother, and 0 otherwise.

For child characteristics, we include age, gender, birth order, and disability. The dummy variable for disability takes the value of 1 for disabled children. The birth order variable is defined as the child's rank by age among his or her siblings and it is introduced to capture the effect of the intra-household resource allocation on child education. For household characteristics, we consider the ages of the father and mother, father's ethnicity, educational attainment of parents, household size, and holdings of durable goods and productive assets. The educational attainment of the father and mother is defined as the highest school grade they completed. The educational attainment variables are included to capture the value the family places on education and, given that educated parents are usually more affluent, to give another indicator of the family's wealth. Since the effect of asset holdings on child education can vary with the types of assets, we account for durable goods and productive assets separately in our analysis. The value of durable goods is the total value of the five most valuable goods in the household, and the value of productive assets is the total value of assets used in the most important and second most important economic activities of the household.

To account for households' ability to cope with shocks, we specify two groups of households with and without borrowing constraints. The impacts of shocks for constrained and non-constrained households are estimated using the following equation:

$$S_{iht} = \beta_0 + \beta_C X^C_{iht} + \beta_H X^H_{ht} + \beta_S Shock_{ht} + \beta_F Contraint_{ht} + \beta_I Shock_{ht} Constraint_{ht} + \delta_i + \epsilon_{iht} \quad (2)$$

Again S_{iht} is the educational outcomes for child *i*, from household *h* at time *t*. X^{C}_{iht} and X^{H}_{ht} are the vectors of child and households characteristics. $Shock_{ht}$ is the shock variables, and $Constraint_{ht}$ is a dummy variable that is equal to 1 for borrowing constrained households. As discussed in the previous section, we use the information on households' short-term financing ability from the Young Lives survey and define as being borrowing-constrained any household that is unable or to raise the specified amount of money or uncertain about it. The parameter β_S now measures the impacts of shocks on educational outcomes for households without borrowing constraints. By contrast, parameter β_I for the interaction term between shock and constraint variables measures the impacts of shocks for borrowing-constrained households.

Poor households are more likely to be borrowing-constrained because they have limited savings and buffer assets and are less likely to have access to credit, especially through official channels. Thus shocks may have more serious consequences for the poor and constrained group. To examine this hypothesis, we also estimate Equation 2 for the sub-sample of poor households, which are defined as the first two expenditure quintiles.[13]

4.2. Educational outcomes

Educational outcomes can be assessed in terms of quantity or quality. With regard to the quantity of education, one can refer to school attendance and drop-out rates, the number of years of schooling, schooling time, or study time out of school. The quality of education refers to children's performance at school, but it is difficult to measure and assess since information on children's academic achievement is largely not available from household surveys.

There is no clear-cut separation between the quantity and the quality indicators of education, and some education indicators can be used to investigate the changes in the quantity or quality of education, depending on the context. If a reduction in educational expenditure is associated with the withdrawal of a child from school, the change in educational expenditure reflects the quantity of education. However, if a child remains in school but the family cuts spending on school materials, the change in education expenditure can be associated with a lower quality of education. Similarly, a change in study time can affect both the quantity and quality of education. Children may not be withdrawn from school, but they have to work more to support their families and thus have less time for studying. Having less study time can result in lower academic achievement at school.

Shocks can affect both the quantity and quality of education. However, the research on shocks and child education tends to focus on school attendance when educational outcomes are investigated. This leaves open other channels through which shocks can be translated into educational outcomes. Severe shocks can trigger large income losses, and households may be forced to withdraw their children from school. But even if children are not withdrawn from school, their educational performance can be affected by reductions in educational expenditure and study time.

13 Since poor households are over-sampled in the Young Lives survey, it is more adequate to consider the first two quintile groups as poor. In the nationally representative Vietnam Household Living Standard Survey (VHLSS) conducted in 2006, all rural households belonging to the first quintile group are considered as poor. Our estimation shows that the mean per capita expenditure for the second quintile of the Young Lives sample was 2.5 million dong in 2006, which is slightly higher than the mean expenditure of 2.4 million dong for the first quintile of the VHLSS sample in the same year.

We use three educational indicators to examine the effect of shocks on the quantity and quality of education. More specifically, we will investigate the impacts of shocks on the probability of children dropping out of school, the child's study time outside school, and household educational expenditure. The study time out of school is measured by the number of hours children spend studying outside school. The probability of drop-out is used to capture the effect of shocks on the quantity of education. As further discussed in the next section, the changes in study time outside school and educational expenditure capture the effect of shocks on both quality and quantity, but they can be used as an indicator of the quality of education when their effect on school attendance is excluded.

5. Empirical results

Using the above equations, we estimate the impacts of crop and health shocks on the probability of drop-out, study time outside school, and household expenditure on education, controlling for child and household characteristics. The control variables relating to the child consist of age, gender, birth order, and disability. For household characteristics, we include the ethnicity of the father, the ages of the father and mother, the highest grade obtained by the father and the mother, household size, and the value of productive assets and durable goods. The summary statistics for variables used in the empirical analysis are presented in Table 6.

Table 6. *Summary statistics for explanatory variables*

	Mean	Standard deviation	Min	Max
A. Whole sample				
Round dummy (Round 3=1)	0.5808	0.4935	0	1
Age	11.2283	3.2723	6	17
Gender (girl=1)	0.5211	0.4996	0	1
Birth order	2.1452	1.1009	1	9
Disability (disabled child=1)	0.0060	0.0773	0	1
Father's ethnicity (majority ethnic=1)	0.7442	0.4364	0	1
Age of father	38.7173	6.6368	20	79
Father's education (highest grade completed)	5.9250	4.0652	0	14
Age of mother	36.2136	6.3308	19	65
Mother's education (highest grade completed)	5.2372	3.9231	0	14
Household size	5.8899	2.1345	3	19
Log value of productive assets	6.4190	2.6482	0	14.51
Log value of durables	8.5873	1.4133	0	14.30
Borrowing constraints	0.5981	0.4903	0	1
Crop shocks	0.1939	0.3954	0	1
Health shocks	0.1551	0.3621	0	1
Number of observations	7,149			

	Mean	Standard deviation	Min	Max
B. Sub-sample of poor households				
Round dummy (Round 3=1)	0.5588	0.4966	0	1
Age	11.0505	3.2947	6	17
Gender (girl=1)	0.5190	0.4997	0	1
Birth order	2.5158	1.2946	1	9
Disability (disabled child=1)	0.0071	0.0838	0	1
Father's ethnicity (majority ethnic=1)	0.5421	0.4983	0	1
Age of father	38.4174	7.8393	20	79
Father's education (highest grade completed)	4.1794	3.9358	0	14
Age of mother	36.0804	7.3898	19	65
Mother's education (highest grade completed)	3.5424	3.7071	0	14
Household size	6.9309	2.4673	3	19
Log value of productive assets	5.6642	2.3156	0	12.44
Log value of durables	7.9128	1.4971	0	10.73
Borrowing constraints	0.7707	0.4204	0	1
Crop shocks	0.1994	0.3996	0	1
Health shocks	0.1595	0.3662	0	1
Number of observations	3,110			

5.1. Shocks and school drop-out

Table 7 presents the probit estimation of school drop-out, and Table 8 presents the results of the probit estimation with community fixed effects. With regard to child and household characteristics, most of the explanatory variables are statistically significant and have the expected signs. The probability of dropping out of school increases as the child gets older and with child birth order, suggesting that older children and children with more young brothers and sisters are more likely to drop out of school. Girls are less likely to drop out of school than boys. As for household characteristics, higher educational attainment by the father and mother significantly reduce the probability of school drop-out. Living in a larger household raises the probability of school drop-out, and the effect of household size on school drop-out is statistically significant. Having an older mother significantly reduces the likelihood of children being pulled out of school, but the effect of the father's age is largely negligible. Borrowing constraints also have a positive effect on school drop-out, but their effect is not statistically significant.

Table 7. *Probability of school drop-out*

	Equation 1	Equation 2	Equation 2 (sub-sample of poor households)
Round dummy	0.019**	0.015*	0.002
(Round 3=1)	(0.01)	(0.01)	(0.02)
Age	0.037***	0.038***	0.062***
	(0.00)	(0.00)	(0.00)
Gender	-0.019**	-0.018**	-0.007
(girl=1)	(0.01)	(0.01)	(0.02)
Birth order	0.017***	0.016***	0.012
	(0.00)	(0.00)	(0.01)
Disability	0.549***	0.547***	0.564***
(disabled child=1)	(0.09)	(0.09)	(0.11)
Father's ethnicity	0.008	0.009	-0.004
(majority ethnic=1)	(0.01)	(0.01)	(0.02)
Age of father	0.000	0.000	0.001
	(0.00)	(0.00)	(0.00)
Father's education	-0.010***	-0.010***	-0.018***
(highest grade completed)	(0.00)	(0.00)	(0.00)
Age of mother	-0.003**	-0.003**	-0.005**
	(0.00)	(0.00)	(0.00)
Mother's education	-0.004***	-0.004***	-0.006*
(highest grade completed)	(0.00)	(0.00)	(0.00)
Household size	0.027***	0.027***	0.041***
(number of household members)	(0.00)	(0.00)	(0.00)
Productive assets	-0.000	0.000	-0.005
(log value of productive assets)	(0.00)	(0.00)	(0.00)
Durable goods	-0.027***	-0.026***	-0.030***
(log value of durables)	(0.00)	(0.00)	(0.01)
Crop shocks	0.009	-0.006	-0.085**
(crop failure)	(0.01)	(0.02)	(0.04)
Health shocks	0.017	-0.005	-0.035
(illness of fathers and mothers)	(0.01)	(0.02)	(0.05)
Borrowing constraints		0.010	0.007
(constrained households=1)		(0.01)	(0.02)
Crop shocks *		0.024	0.158**
borrowing constraint		(0.02)	(0.06)
Health shocks *		0.033	0.065
borrowing constraint		(0.03)	(0.06)
Number of observations	7149	7149	3110
R^2	0.297	0.298	0.296
p values	0.000	0.000	0.000

Notes: Robust standard errors in parentheses. * Significant at 10%; ** significant at 5%; *** significant at 1%. The coefficients show marginal effects. dy/dx shows the discrete change from 0 to 1 for dummy variables.

Table 8. *Probability of school drop-out (with community fixed effects)*

	Equation 1	Equation 2	Equation 2 (sub-sample of poor households)
Round dummy	0.019**	0.014*	0.002
(Round 3 = 1)	(0.01)	(0.01)	(0.02)
Age	0.038***	0.038***	0.064***
	(0.00)	(0.00)	(0.00)
Gender	-0.014*	-0.014*	-0.002
(girl=1)	(0.01)	(0.01)	(0.02)
Birth order	0.011**	0.010**	0.004
	(0.00)	(0.00)	(0.01)
Disability	0.310***	0.309***	0.445***
(disabled child=1)	(0.05)	(0.05)	(0.11)
Father's ethnicity	-0.011	-0.007	-0.039
(majority ethnic=1)	(0.01)	(0.01)	(0.03)
Age of father	0.000	0.000	0.001
	(0.00)	(0.00)	(0.00)
Father's education	-0.010***	-0.010***	-0.015***
(highest grade completed)	(0.00)	(0.00)	(0.00)
Age of mother	-0.003**	-0.003**	-0.006**
	(0.00)	(0.00)	(0.00)
Mother's education	-0.003**	-0.003**	-0.005
(highest grade completed)	(0.00)	(0.00)	(0.00)
Household size	0.025***	0.025***	0.040***
(number of household members)	(0.00)	(0.00)	(0.00)
Productive assets	-0.003	-0.002	-0.006
(log value of productive assets)	(0.00)	(0.00)	(0.00)
Durable goods	-0.024***	-0.023***	-0.029***
(log value of durables)	(0.00)	(0.00)	(0.01)
Crop shocks	0.003	-0.015	-0.093**
(crop failure)	(0.01)	(0.02)	(0.04)
Health shocks	0.012	-0.013	-0.052
(illness of fathers and mothers)	(0.01)	(0.02)	(0.05)
Borrowing constraints		0.013	0.009
(constrained households=1)		(0.01)	(0.02)
Crop shocks *		0.028	0.135***
borrowing constraint		(0.02)	(0.05)
Health shocks *		0.036	0.078
borrowing constraint		(0.02)	(0.06)
Number of observations	7149	7149	3110
R^2	0.311	0.313	0.311
p values	0.000	0.000	0.000

Notes: Robust standard errors in parentheses. * Significant at 10%; ** significant at 5%; *** significant at 1%. The coefficients show marginal effects. dy/dx shows the discrete change from 0 to 1 for dummy Productive assets and durable goods have different effects on child education. Having more durable goods is associated with a lower probability of school drop-out, indicating that more affluent households can and do invest more in their children. Having more productive assets is positively correlated with the probability of school drop-out, but the effect of productive assets on school drop-out is small and not statistically significant. As shown later in the regression on children's study time, the value of productive assets is also negatively correlated with self-study time, suggesting that these assets are complementary to child work rather than likely to substitute for it.

The estimation of Equation 1 shows that crop and health shocks tend to increase school drop-out, but for the sample as a whole the impacts of these shocks are small and not statistically significant. Health shocks raise the probability of drop-out by 1.7 per cent, while crop shocks raise this probability by only 0.9 per cent. The estimation of Equation 2 shows that these shocks have different effects on the households with and without borrowing constraints. The coefficient of the shock variables now turns negative in the probit estimation of school drop-out. Since these variables measure the impact of shocks for those households without borrowing constraints, the negative coefficient suggests that shocks do not affect school attendance in unconstrained households. For the group with borrowing constraints, the interaction term between the shock variables and borrowing constraints turns positive, indicating an adverse effect of shocks on school attendance. However, the effect of crop and health shocks on school drop-out is again minimal and not statistically significant.

The estimation of Equation 2 for the sub-sample of poor households shows that shocks have more profound effects for poor households with borrowing constraints. Crop shocks significantly affect the school attendance of children from poor and constrained households, but the effects are not large. In the probit estimation without community fixed effects, the occurrence of crop shocks increases the probability of school drop-out by 15.8 per cent. Health shocks raise the probability of dropout by 6.7 per cent, but the effect of health shocks is not statistically significant. The probit estimation with community fixed effects gives similar results to the estimation without fixed effects.

5.2. The effect of shocks on study time

Tables 9 and 10 (see Appendix) present the estimation results for the effect of shocks on study time out of school using Equation 1 and Equation 2. Each equation is estimated using ordinary least-square (OLS) and fixed effect estimations with community and household fixed effects. The estimation results show that crop shocks have stronger impacts on self-study time than on school drop-out, and the impact of crop shocks on study time are largely statistically significant. The occurrence of crop shocks reduces study time for children from borrowing-constrained household by 8.2 per cent in the community fixed effect estimation, and by 15.7 per cent in the estimation with household fixed effects. Once again, crop shocks have no negative effect on study time for children from unconstrained households.

The estimation of the effect of crop shocks on study time out of school has one problem – that when children are withdrawn from school, their studying time will become zero. Thus the effect on study time may include the quantity effect of shocks on school drop-out. To further examine the possible effect of crop shocks on child performance at school, we restrict the sample to those children remaining at school and estimate the effect on study time out of school for only school attenders. The results reported in Table 10 (see Appendix) again confirm that crop shocks significantly reduce the study time out of school of children from borrowing-constrained households.

The larger effects of crop shocks on self-study time are observed for children from poor and constrained households. The coefficient of the interaction term between the shock variable and borrowing constraints nearly doubles in the estimation for poor households as compared to that for the whole sample. In the estimation for the sample of school attenders, the occurrence of crop shocks reduces self-study time by 15.2 per cent in the commune fixed-effect estimation, and by 31 per cent in the estimation with household fixed-effects. It is also interesting to note that we observe no adverse impacts of shocks for the poor households

without borrowing constraints. The crop shock is found positively correlated with self-study time, but the coefficients are not statistically significant.

The impact of health shocks on schooling time and self-study time is largely in line with that of crop shocks. Health shocks affect child education in borrowing-constrained households, but they have no adverse effect in non-constrained households. Health shocks tend to reduce self-study time for children from the constrained group, but their effects are not statistically significant in most cases. The impacts of health shocks are smaller than those of crop shocks, especially for poor and constrained households. Due to their covariate nature, crop shocks can have a greater effect on household welfare and are more difficult to cope with. Crop shocks resulting from diseases and adverse climate events tend to affect all households in a commune or village, and so shock-affected households are less likely to receive support from relatives or neighbours. Furthermore, crop shocks may lower the economic activity of the commune as a whole and this may further affect household income through the multiplier process. By contrast, since health shocks are idiosyncratic, households can rely on risk-sharing or other insurance mechanisms to mitigate their adverse effect.

5.3. Shocks and educational expenditure

To capture the quality and quantity effect of educational expenditure, we estimate the impact of shocks on household educational expenditure and the average educational expenditure per school attender. Since the number of school attenders changes over time due to new drop-outs or entrants, the changes in household educational expenditure cover both the effect of shocks on school attendance and the effect on expenditure per child. Thus the change in education expenditure per school attender, which is adjusted for the number of students, offers a better indicator to measure the effect of shocks on the quality of education. To further check for the effect on the quality of education, we also estimate the effect of shocks on household educational expenditure for the sub-sample of households without children who have dropped out.

We distinguish school fees from other educational expenditure since these components can be differently affected by shocks. Since school fees are compulsory, households cannot reduce this component as long as their children remain in school. Other education expenditure consists of tuition fees for extra classes and private tutors, and spending on school books stationery, school uniforms and transportation. Households are more likely to cut these non-compulsory components of educational expenditure when they experience an income loss. The reduction in fees for extra tuition or spending on books can affect academic performance at school, and thus the change in other educational expenditure offers a better reference for the effect of shocks on the quality of education than school fees.

We estimate the effect of shocks on total household educational expenditure and other educational expenditure, controlling for community fixed effects and household characteristics. The estimation results for the whole sample and the sub-sample of poor households are presented in Table 11 and Table 12 respectively (see Appendix).[14] The empirical results show that crop shocks tend to be associated with higher expenditure on child education for the non-constrained group, but lower educational expenditure for

14 Even not presented here, our estimation shows no clear, and sometimes unexpected, correlation between shock variables and school fees. In some cases, shocks are associated with higher school fees for the borrowing-constrained groups, but the correlation between shock variables and school fees is not statistically significant.

constrained groups. More profound effects of shocks are observed for other educational expenditure than total household expenditure on education. However, the effect of shocks becomes smaller and no longer statistically significant when the change in number of school attenders is accounted for in the case of average expenditure per school attenders and in the regression for the sub-sample of households with no drop-outs.

The estimation with sub-sample of poor households shows similar empirical results with shocks sharply reducing other educational expenditure in poor and constrained households. Crop shocks reduce other educational expenditure by 57 per cent and 54 per cent respectively, and their effects are statistically significant.

6. Conclusion

In this paper, we have analysed the impacts of crop and health shocks on child education in rural Vietnam. Our empirical analysis shows that borrowing constraints have a key role in transmitting the effect of shocks to child education. Shocks, especially crop shocks, significantly affect child education in borrowing-constrained households, but they have no adverse impacts on children from unconstrained households. The most vulnerable group is children from poor and borrowing-constrained households with a limited ability to finance temporary income losses.

We have investigated different channels through which shocks can affect child education and shown that shocks affect both the quality and the quantity of education. Poor and borrowing-constrained households not only withdraw children from school, they also reduce study time and spending on education for children who remain in school. The reductions in educational expenditure and study time may affect academic performance at school, and are likely to cause grade repetition and early drop-out from school. The empirical results also suggest that the effect of shocks on school attendance is not severe, but shocks may have greater impacts on the quality of education through the reduction in educational expenditure and study time out of school.

Our analysis has provided further evidence on the adverse effect of shocks on child education. Low educational attainment today can result in bad jobs and low incomes in the future when children grow up. In this way, temporary shocks can have a long-lasting effect on people and may sustain poverty into future generations. Thus adequate attention must be paid to the reduction of households' risks and vulnerabilities and the improvement of their ability to cope with shocks and adverse events. Greater access to credit and direct government support are needed to mitigate the impact of shocks on households and their children, especially poor and borrowing-constrained households. The introduction of crop and health insurance programmes targeted at poor households and other vulnerable groups is also needed to help them cope with the adverse effects of economic and environmental shocks.

References

Beegle, Kathleen, Dehejia Rajeev and Roberta Gatti (2006) 'Child Labor and Agricultural Shocks', *Journal of Development Economics* 81: 80–96

Beegle, Kathleen, Dehejia Rajeev and Roberta Gatti (2003) *Child Labor, Income Shocks and Access to Credit*, Policy Research Working Papers 3075, Washington, DC: World Bank

Cogneau, Denis and Remi Jedwab (2010) *Commodity Price Shocks and Child Outcomes: The 1990 Cocoa Crisis in Côte d'Ivoire*, CEPREMAP Working Paper No. 1018, Paris: Centre pour la recherche économique et ses applications

de Vreyer, Philippe, Nathalie Guilbert and Sandrine Mesplé-Somps (2012) *The 1987–1988 Locust Plague in Mali: Evidence of the Heterogeneous Impact of Income Shocks on Education Outcomes*, Document de Travail DT/2012-05, Paris: Université Paris Dauphine

Dercon, Stefan (2008) *Children and the Food Price Crisis*, Young Lives Policy Brief 5, Oxford: Young Lives

Dercon, Stefan (2007) *Fate and Fear: Risk and its Consequences in Africa*, Working Paper No. GPRG-WPS-074, Oxford: Global Poverty Research Group

Dillon, Andrew (2008) *Child Labor and Schooling Responses to Production and Health Shocks in Northern Mali*, IFPRI Discussion Paper 00756, Washington, DC: International Food Policy Research Institute

Dornan, Paul (2010) *Understanding the Impacts of Crisis on Children in Developing Countries*, Round 3 Preliminary Findings, Oxford: Young Lives

Duryea, Suzanne (1998) *Children's Advancement Through School in Brazil: The Role of Transitory Shocks to Household Income*, Working Paper No. 376, Washington, DC: Inter-American Development Bank

Escobal, Javier, Jaime Saavedra and Pablo Suarez (2005) *Economic Shocks and Changes in School Attendance Levels and Education Expenditure in Peru*, Young Lives Working Paper 13, Oxford: Young Lives

Fafchamps, Marcel, Christophe Udry and Katherine Czukas (1998) 'Drought and Savings in Western Africa: Are Livestock a Buffer Stock?', *Journal of Development Economics* 55.2: 273–305

Ferreira, Francisco H.G. and Norbert Schady (2008) *Aggregate Economic Shocks, Child Schooling and Child Health*, Policy Research Working Paper No. 4701, Washington, DC: World Bank

Funkhouser, Edward (1999) 'Cyclical Economic Conditions and School Attendance in Costa Rica', *Economics of Education Review* 18.1: 31–50

Grimm, Michael (2008) *Food Price Inflation and Children Schooling*, Discussion Paper No. 844, Berlin: German Institute for Economic Research

Guarcello, L., F. Mealli and F. Rosati (2002) *Household Vulnerability and Child Labor: The Effect of Shocks, Credit Rationing and Insurance*, Understanding Children's Work Project Working Paper, Rome: USW (ILO, UNICEF and World Bank)

Gubert, Flore and Anne-Sophie Robillard (2006) *Risks and Schooling Decision in Rural Madagascar: A Panel Data Analysis*, Document de Travail No. 2006-08, Paris: Développement, Institutions et Analyses de Long Terme

Himaz, Rozana (2009) *The Impact of Parental Death on Schooling and Subjective Well-being: Evidence from Ethiopia Using Longitudinal Data*, Young Lives Working Paper 44, Oxford: Young Lives

Jacoby, Hanan G. (1994) 'Borrowing Constraints and Progress Through School: Evidence from Peru', *Review of Economics and Statistics* 76.1: 151–60

Kazianga, Harounan and C. Udry (2006) 'Consumption Smoothing? Livestock, Insurance and Drought in Rural Burkina Faso', *Journal of Development Economics* 79.2: 413–46

Krutikova, Sofya (2010) *Who Gets to Stay in School? Long-run Impact of Income Shocks on Schooling in Rural Tanzania*, Oxford University, CSAE Working Paper Series WPS/2010-36: Oxford: Centre for the Study of African Economies

Le Thuc Duc, Nguyen Thang, Nguyen Van Tien, Mai Thuy Hang and Vu Thi Thu Thuy (2011) *How Do Children Fare in the New Millennium? Initial Findings from Vietnam*, Young Lives Country Report Round 3, Oxford: Young Lives

Le Thuc Duc, Nguyen Phuong Ngoc, Tran Minh Chau, Nguyen Van Tien and Vo Thanh Son (2008) *Young Lives Vietnam Round 2 Survey*, Young Lives Country Report, Oxford: Young Lives

Morduch, Jonathan (1995) 'Income Smoothing and Consumption Smoothing', *Journal of Economic Perspectives* 9.3: 103–14

Nguyen Ngoc P. (2008) *Childhood Poverty in Vietnam: A Review*, Young Lives Technical Note 9, Oxford: Young Lives

Nguyen Viet Cuong and Daniel Mont (2011) *Does Parental Disability Matter to Child Education? Evidence from Vietnam,* Policy Research Working Paper No. 5743, Washington, DC: World Bank

Paxson, Christiana (1992) 'Using Weather Variability to Estimate the Response of Savings to Transitory Income in Thailand', *American Economic Review* 82.1: 15–33

Pham Thi Lan and Nicola Jones (2010) *Education for All in Vietnam: High Enrolment, But Problems of Quality Remain*, Young Lives Policy Brief 4, Oxford: Young Lives

Ravallion, Martin and Dominique van de Walle (2008) *Land in Transition: Reforms and Poverty in Rural Vietnam*, Basingstoke and Washington, DC: Palgrave and World Bank

Sawada, Yasuyuki (2003) *Income Risks, Gender and Human Capital Investment in a Developing Country,* Discussion Paper CIRJE-F-198, Tokyo: Graduate School of Economics, University of Tokyo

Senne, J.N. (2010) *Death and Schooling Decisions over the Short- and Long-Run in Rural Madagascar*, Document de Travail du CREST No. 2010-53, Paris: Institut National de la Statistique et des Etudes Economiques

Tesline, Emil D. and Kathy Lindert (2004) *Risks and Vulnerability in Guatemala: A Quantitative and Qualitative Assessment*, Social Protection Discussion Paper No. 0404, Washington, DC: World Bank

Thai Thuan Q. and Evangelos M. Falaris (2011) *Child Schooling, Child Health and Rainfall Shocks: Evidence from Rural Vietnam*, MPIDR Working Paper 2011-011, Rostock: Max Planck Institute for Demographic Research

World Bank (2003) *Vietnam Development Report 2004: Poverty*, World Bank Report No. 27130-VN, Washington, DC: World Bank

Appendix: Tables 9 to 12

Table 9. *Effect of shocks on study time out of school (Dependent variable is the log of study hours)*

	Equation 1			Equation 2			Equation 2 (sub-sample of poor households)		
	OLS	Commune fixed effects	Household fixed effects	OLS	Commune fixed effects	Household fixed effects	OLS	Commune fixed effects	Household fixed effects
Round dummy	0.132***	0.118***	0.459	0.139***	0.125***	0.503	0.149***	0.120***	0.141
(Round 3=1)	(0.01)	(0.04)	(0.41)	(0.01)	(0.04)	(0.40)	(0.02)	(0.04)	(0.86)
Age	-0.015***	-0.018***	-0.020***	-0.016***	-0.018***	-0.020***	-0.038***	-0.038***	-0.054***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Gender	0.080***	0.061***	0.042***	0.080***	0.061***	0.042***	0.050**	0.034	0.065***
(girl=1)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)
Birth order	-0.048***	-0.039**	-0.025	-0.047***	-0.038**	-0.026	-0.017	-0.014	0.045**
	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
Disability	-0.559***	-0.583**	-0.472***	-0.553***	-0.579**	-0.467***	-0.474***	-0.451	-0.337*
(disabled child=1)	(0.10)	(0.21)	(0.13)	(0.10)	(0.21)	(0.13)	(0.15)	(0.29)	(0.17)
Father's ethnicity	0.033	0.069*		0.031	0.065*		0.054*	0.097*	
(majority ethnic=1)	(0.02)	(0.04)		(0.02)	(0.04)		(0.03)	(0.05)	
Age of father	0.001	-0.002	-0.112	0.001	-0.002	-0.095	-0.002	-0.003	0.241
	(0.00)	(0.00)	(0.18)	(0.00)	(0.00)	(0.17)	(0.00)	(0.00)	(0.28)
Father's education	0.026***	0.017***	-0.006	0.026***	0.017***	-0.006	0.035***	0.019***	-0.000
(highest grade attained)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
Age of mother	-0.002	0.004	0.002	-0.001	0.004	-0.028	0.006*	0.008**	-0.231***
	(0.00)	(0.00)	(0.09)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.05)
Mother's education	0.024***	0.008*	-0.007	0.024***	0.008*	-0.007	0.024***	0.007	0.011
(highest grade attained)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.02)
Household size	-0.044***	-0.034***	-0.054**	-0.044***	-0.035***	-0.056**	-0.050***	-0.034***	-0.104***
(number of household members)	(0.00)	(0.00)	(0.02)	(0.00)	(0.01)	(0.02)	(0.00)	(0.01)	(0.02)
Productive assets	-0.005*	-0.000	-0.005	-0.006**	-0.001	-0.005	0.000	-0.000	-0.005
(log value of productive assets)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Durable goods	0.059***	0.054***	0.014	0.058***	0.053***	0.016	0.061***	0.053***	0.060***
(log value of durables)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Crop shocks	-0.002	-0.015	-0.018	0.047*	0.033	0.076*	0.081	0.045	0.126
(crop failure)	(0.02)	(0.04)	(0.03)	(0.03)	(0.05)	(0.04)	(0.05)	(0.06)	(0.09)
Health shocks	-0.006	0.005	0.082***	0.018	0.052	0.152***	0.080	0.161***	0.160
(illness of fathers and mothers)	(0.02)	(0.02)	(0.03)	(0.03)	(0.05)	(0.05)	(0.06)	(0.06)	(0.10)
Borrowing constraints				-0.009	0.001	0.048*	-0.007	0.011	0.037
(constrained households=1)				(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)
Crop shocks *				-0.083**	-0.082*	-0.157***	-0.175***	-0.146**	-0.301***
borrowing constraint				(0.03)	(0.04)	(0.05)	(0.06)	(0.05)	(0.11)
Health shocks *				-0.037	-0.074	-0.116**	-0.071	-0.149**	-0.049
borrowing constraint				(0.04)	(0.07)	(0.06)	(0.07)	(0.07)	(0.11)
Constants	0.682***	0.680***	5.568	0.702***	0.692***	5.930	0.651***	0.674***	0.438
	(0.06)	(0.10)	(5.10)	(0.07)	(0.10)	(4.95)	(0.09)	(0.09)	(10.54)
Number of observations	7,149	7,149	7,149	7,149	7,149	7,149	3,110	3,110	3,110
R^2	0.269	0.260	0.010	0.270	0.261	0.011	0.319	0.307	0.040
p values	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Robust standard errors in parentheses. * Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 10. *Effect of shocks on study time out of school for the sub-sample of school attenders (Dependent variable is the log of study hours)*

	Equation 1			Equation 2			Equation 2 (sub-sample of poor households)		
	OLS	Commune fixed effects	Household fixed effects	OLS	Commune fixed effects	Household fixed effects	OLS	Commune fixed effects	Household fixed effects
Round dummy	0.206***	0.191***	0.111	0.210***	0.194***	0.167	0.203***	0.167***	-1.265***
(Round 3=1)	(0.01)	(0.04)	(0.48)	(0.01)	(0.04)	(0.47)	(0.02)	(0.05)	(0.21)
Age	0.040***	0.036***	0.029***	0.040***	0.036***	0.029***	0.034***	0.035***	0.019**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Gender	0.058***	0.036**	0.025**	0.058***	0.037**	0.026**	0.056***	0.032	0.035*
(girl=1)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Birth order	-0.017**	-0.012	0.020	-0.017**	-0.012	0.019	-0.012	-0.012	0.045*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Disability	-0.111	-0.173	-0.373**	-0.102	-0.168	-0.363**	0.132	0.078	0.219
(disabled child=1)	(0.13)	(0.21)	(0.17)	(0.13)	(0.21)	(0.17)	(0.25)	(0.28)	(0.31)
Father's ethnicity	0.074***	0.060**		0.075***	0.060**		0.088***	0.052	
(majority ethnic=1)	(0.02)	(0.03)		(0.02)	(0.03)		(0.03)	(0.04)	
Age of father	-0.000	-0.003	0.097	-0.000	-0.003	0.100	-0.005*	-0.005**	0.490***
	(0.00)	(0.00)	(0.13)	(0.00)	(0.00)	(0.13)	(0.00)	(0.00)	(0.05)
Father's education	0.016***	0.006**	-0.007	0.016***	0.006**	-0.007	0.024***	0.006	-0.004
(highest grade attained)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)
Age of mother	-0.004**	0.002	-0.066	-0.004**	0.002	-0.088	0.003	0.004	0.003
	(0.00)	(0.00)	(0.16)	(0.00)	(0.00)	(0.15)	(0.00)	(0.00)	(0.05)
Mother's education	0.021***	0.004	-0.004	0.020***	0.004	-0.004	0.022***	0.004	-0.016
(highest grade attained)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)
Household size	-0.010***	-0.002	-0.052**	-0.010***	-0.002	-0.052**	-0.018***	0.003	-0.124***
(number of household members)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.04)
Productive assets	-0.007***	-0.005	-0.010**	-0.008***	-0.005	-0.010**	-0.004	-0.006	-0.016
(log value of productive assets)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
Durable goods	0.035***	0.031***	0.017	0.035***	0.032***	0.018	0.051***	0.036***	0.052**
(log value of durables)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
Crop shocks	0.017	-0.004	-0.006	0.063***	0.033	0.076**	0.053	-0.030	0.152
(crop failure)	(0.01)	(0.04)	(0.02)	(0.02)	(0.06)	(0.03)	(0.04)	(0.07)	(0.09)
Health shocks	0.014	0.017	0.104***	0.010	0.038	0.100**	0.045	0.121**	0.109
(Illness of fathers and mothers)	(0.01)	(0.02)	(0.03)	(0.02)	(0.03)	(0.04)	(0.05)	(0.05)	(0.10)
Borrowing constraints				0.000	0.018	0.046**	0.010	0.036	0.100*
(constrained households=1)				(0.01)	(0.03)	(0.02)	(0.03)	(0.03)	(0.06)
Crop shocks *				-0.080***	-0.066	-0.143***	-0.115**	-0.049	-0.310***
borrowing constraint				(0.03)	(0.06)	(0.04)	(0.05)	(0.07)	(0.11)
Health shocks *				0.008	-0.035	0.001	-0.001	-0.089*	0.092
borrowing constraint				(0.03)	(0.04)	(0.05)	(0.05)	(0.05)	(0.12)
Constants	0.373***	0.431***	-0.276	0.376***	0.415***	0.315	0.185**	0.337***	-16.775***
	(0.06)	(0.09)	(5.60)	(0.06)	(0.09)	(5.46)	(0.09)	(0.11)	(2.69)
Number of observations	5859	5859	5859	5859	5859	5859	2261	2261	2261
R2	0.269	0.229	0.036	0.270	0.229	0.036	0.320	0.240	0.002
p values	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.182

Notes: Robust standard errors in parentheses. * Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 11. *Effect of shocks on household expenditure on education (Dependent variable is the log of educational expenditure)*

	Household educational expenditure		Educational expenditure per school attender		Household educational expenditure (sub-sample of households with no drop-out children)	
	Total expenditure	Other expenditure	Total expenditure	Other expenditure	Total expenditure	Other expenditure
Round dummy	0.629***	0.865***	0.675***	0.847***	0.689***	0.873***
(Round 3=1)	(0.06)	(0.08)	(0.05)	(0.07)	(0.05)	(0.07)
Father's ethnicity	0.173*	0.228**	0.298***	0.384***	0.116	0.212*
(majority ethnic=1)	(0.10)	(0.11)	(0.06)	(0.08)	(0.08)	(0.12)
Age of father	-0.006	-0.002	-0.001	0.003	0.004	0.008
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Father's education	0.058***	0.057***	0.033***	0.033***	0.032***	0.035***
(highest grade completed)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age of mother	0.015*	0.021**	0.016***	0.018***	0.031***	0.033***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Mother's education	0.017**	0.022**	0.013*	0.018**	0.008	0.012
(highest grade completed)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Household size	-0.022*	-0.031**	-0.029***	-0.027***	0.031**	0.031**
(number of household members)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Productive assets	0.023**	0.026**	0.017**	0.016**	0.025***	0.026***
(log value of productive assets)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Durable goods	0.191***	0.191***	0.108***	0.110***	0.118***	0.123***
(log value of durables)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Borrowing constraints	-0.016	-0.050	-0.052	-0.080	-0.069	-0.102*
(constrained households=1)	(0.07)	(0.07)	(0.05)	(0.05)	(0.05)	(0.06)
Crop shocks	0.054	0.167***	0.023	0.100**	0.027	0.111*
(crop failure)	(0.06)	(0.06)	(0.06)	(0.04)	(0.06)	(0.06)
Health shocks	0.052	0.075	-0.071	-0.043	-0.045	0.027
(illness of fathers and mothers)	(0.07)	(0.07)	(0.06)	(0.06)	(0.06)	(0.07)
Crop shocks *	-0.089	-0.307**	-0.013	-0.175*	0.003	-0.162
borrowing constraints	(0.09)	(0.13)	(0.08)	(0.10)	(0.09)	(0.12)
Health shocks *	-0.149	-0.136	0.112	0.116	0.138	0.105
borrowing constraints	(0.14)	(0.14)	(0.07)	(0.08)	(0.09)	(0.11)
Constants	3.464***	2.504***	3.922***	3.046***	3.435***	2.501***
	(0.27)	(0.28)	(0.22)	(0.21)	(0.24)	(0.22)
Number of observations	3,408	3,408	3,215	3,215	2,644	2,644
R^2	0.362	0.384	0.438	0.469	0.357	0.403
p values	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Robust standard errors in parentheses; Significant at 10%; ** significant at 5%; *** significant at 1%.

Table 12. *Effect of shocks on household expenditure on education*
Sub-sample of poor households
(Dependent variable is the log of educational expenditure)

	Household educational expenditure		Educational expenditure per school attender		Household educational expenditure (sub-sample of households with no drop-out children)	
	Total expenditure	Other expenditure	Total expenditure	Other expenditure	Total expenditure	Other expenditure
Round dummy	0.540***	0.832***	0.604***	0.767***	0.587***	0.775***
(Round 3=1)	(0.11)	(0.14)	(0.07)	(0.10)	(0.08)	(0.13)
Father's ethnicity	0.237	0.261	0.244**	0.340**	0.064	0.203
(majority ethnic=1)	(0.20)	(0.17)	(0.09)	(0.13)	(0.12)	(0.15)
Age of father	-0.010	-0.010	-0.002	-0.000	0.004	0.003
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Father's education	0.061***	0.058***	0.031***	0.027***	0.026	0.027*
(highest grade completed)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Age of mother	0.008	0.019	0.011	0.014	0.028**	0.031**
	(0.02)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Mother's education	0.014	0.020	0.014	0.022	0.002	0.006
(highest grade completed)	(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Household size	-0.012	-0.016	-0.015	-0.000	0.029	0.037*
(number of household members)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)
Productive assets	0.019	0.041**	0.019**	0.025**	0.018*	0.021*
(log value of productive assets)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Durable goods	0.226***	0.210***	0.093**	0.091**	0.126**	0.134**
(log value of durables)	(0.05)	(0.05)	(0.04)	(0.04)	(0.05)	(0.05)
Borrowing constraints	0.018	0.021	-0.069	-0.098	-0.102	-0.127*
(constrained households=1)	(0.14)	(0.12)	(0.09)	(0.07)	(0.07)	(0.06)
Crop shocks	0.131	0.364*	-0.030	0.116	-0.129	0.056
(crop failure)	(0.23)	(0.18)	(0.18)	(0.12)	(0.20)	(0.18)
Health shocks	0.292*	0.351*	0.039	0.034	0.159	0.225
(illness of fathers and mothers)	(0.17)	(0.17)	(0.16)	(0.15)	(0.16)	(0.23)
Crop shocks *	-0.160	-0.565***	0.063	-0.194	0.189	-0.138
borrowing constraints	(0.23)	(0.19)	(0.18)	(0.15)	(0.23)	(0.21)
Health shocks *	-0.501**	-0.537**	-0.101	-0.101	-0.124	-0.201
borrowing constraints	(0.21)	(0.20)	(0.17)	(0.17)	(0.21)	(0.29)
Constants	3.044***	2.087***	3.812***	2.956***	3.385***	2.489***
	(0.40)	(0.43)	(0.33)	(0.29)	(0.38)	(0.35)
Number of observations	1,240	1,240	1,126	1,126	815	815
R^2	0.404	0.418	0.470	0.499	0.341	0.407
p values	0.000	0.000	0.000	0.000	0.000	0.000

Notes: Robust standard errors in parentheses. * Significant at 10%; ** significant at 5%; *** significant at 1%.

Shocks, Borrowing Constraints and Schooling in Rural Vietnam

The impact of crop and health shocks on child education in rural Vietnam is investigated in this paper using a longitudinal database of Vietnamese children. The author explicitly takes into account borrowing constraints and investigates the different effects of shocks on constrained and non-constrained households. His empirical analysis provides further evidence on the role of borrowing constraints in transmitting the effect of shocks. While non-constrained households are able to smooth away the adverse effect of shocks without any consequences for child education, the effect of shocks falls disproportionately on children from borrowing-constrained households, which have limited ability to cope with temporary income losses. The paper finds that shocks can affect both the quantity and quality of education, especially for children from poor and constrained households. Shock-affected households not only withdraw children from school, but they also sharply reduce their spending on child education and decrease children's study time out of school. The reductions in educational expenditure and study time may affect children's performance at school and are likely to cause grade repetition and leaving school early.

Young Lives
An International Study of Childhood Poverty

Contact:
Young Lives
Oxford Department of International Development (ODID), University of Oxford, Queen Elizabeth House, 3 Mansfield Road, Oxford OX1 3TB, UK
Tel: +44 (0)1865 281751
Email: younglives@younglives.org.uk
Website: www.younglives.org.uk

Young Lives
An International Study of Childhood Poverty

About Young Lives

Young Lives is an international study of childhood poverty, involving 12,000 children in 4 countries over 15 years. It is led by a team in the Department of International Development at the University of Oxford in association with research and policy partners in the 4 study countries: Ethiopia, India, Peru and Vietnam.

Through researching different aspects of children's lives, we seek to improve policies and programmes for children.

Young Lives Partners

Young Lives is coordinated by a small team based at the University of Oxford, led by Professor Jo Boyden.

- *Ethiopian Development Research Institute, Ethiopia*
- *Centre for Economic and Social Sciences, Andhra Pradesh, India*
- *Sri Padmavathi Mahila Visvavidyalayam (Women's University), Andhra Pradesh, India*
- *Grupo de Análisis para el Desarollo (Group for the Analysis of Development), Peru*
- *Instituto de Investigación Nutricional (Institute for Nutrition Research), Peru*
- *Center for Analysis and Forecasting, Vietnamese Academy of Social Sciences, Vietnam*
- *General Statistics Office, Vietnam*
- *Child and Youth Studies Group (CREET), The Open University, UK*
- *Oxford Department of International Development (ODID), University of Oxford, UK*
- *Save the Children*