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Vietnam's Trade Liberalisation: Potential Impacts on Child Well-being

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Abstract

Following extensive economic and market reforms and more than a decade of negotiations, Vietnam became the latest country to accede to the World Trade Organization in November 2006. While it is expected that greater integration into the world economy will boost Vietnam's economic growth and contribute to the country's ongoing transition towards a market economy, there are concerns about potentially negative impacts on vulnerable sectors of the population, including remote rural populations, women and children. This paper examines the possible impacts of Vietnam's trade liberalisation on children in poor communities. It focuses on three key aspects of child well-being – child work (domestic and extra-household), educational attainment and health status – drawing on data from the first wave of the Young Lives Vietnam longitudinal survey on childhood poverty. Our main findings point to significant differences based on ethnicity, household poverty status and vulnerability to declining living standards, parental (especially maternal) education levels, children's involvement in work activities, and access to public services.

1. Introduction

The implementation of market reforms since the mid-1980s has contributed to Vietnam's emergence as one of the fastest accelerating economies in the world. High sustained economic performance has also facilitated significant poverty alleviation.² One of the key components of Vietnamese economic reforms has been the government's attempt to integrate more fully into the global economy. In November 2006, after 11 years of market restructuring and lengthy negotiations, the country became the latest member of the World Trade Organization (WTO).

In the process of joining the WTO, Vietnam has made multiple commitments to restructuring its economy and related policy frameworks. A key question that is beginning to emerge, however, relates to the social impact of trade liberalisation and associated reforms, especially in a context of growing inequality (eg, Hague and Nguyen, 2005). This is of particular concern, given that poverty rates among some rural populations, especially ethnic minorities, are four to five times higher than average (Vietnam MDG Report, 2005).

The mechanisms through which globalisation in general and trade liberalisation in particular affects poverty are complex (eg, Winters *et al.*, 2002, Duncan and Doan Quang, 2000) and there are no easy answers. Nevertheless, resulting changes are likely to be painful for some sectors of the population, especially the disadvantaged and vulnerable. In the case of Vietnam, although trade liberalisation has led to improved welfare for the poor (Benjamin and Brandt, 2002) and did not exacerbate inequality (Seshan, 2004, 2005; McCarty and Tran, 2003), analysts have raised particular concerns about remote rural populations, especially those involved in some agricultural sectors (sugar, salt, maize, some animal products) which are likely to face competition from subsidised European Union (EU) and US products (Kirkbride, 2005), as well as possible gendered implications, given the unequal labour market positioning of men and women (eg, Tran, 2002).³

Taking as our starting point a growing body of literature on the ways in which macro-economic policy shifts may have an impact on children (Marcus, 2003; Waddington 2004; Ansell, 2005), this paper explores the possible effects of WTO accession on Vietnamese children.⁴ Our rationale for a particular focus on child well-being is threefold. First, a broader body of literature emphasises that childhood poverty cannot simply be deduced from household poverty but is also shaped by intra-household distribution of power and resources (eg, Regmi and Tisdell, 2002; [ADDED]). Second, addressing the particular vulnerabilities faced by children living in poverty may be important for tackling life-course and intra-generational poverty transfers. Economic shocks experienced as an infant or child may have lasting impacts on human capital development (eg, Harper *et al.*, 2003). Lastly, children under 14 years constitute more than 30 per cent of the population in Vietnam (World Bank, 2006), so to consider the impacts of macro-economic reforms on poverty reduction without paying specific attention to the effects on childhood poverty risks neglecting a significant proportion of the poor.⁵

Our analysis utilises data from the Young Lives Project, an international longitudinal policy-research project on childhood poverty.⁶ We adopt a modified version of the framework developed by Waddington (2004) and Anderson *et al.* (2005) to examine the impact of trade liberalisation on children. The framework traces the impacts of trade liberalisation to macro-level variables through to household level variables and finally child well-being (see Figure 2.1 below). Whereas research to date on the relationship between trade liberalisation and child welfare has focused predominantly on the link between trade openness/liberalisation and child labour (Edmonds and Turk, 2004; Edmonds and Pavcnik, 2004 a, b), we also consider the potential impact on children's scholastic achievement and health status. Owing to data limitations, we pay greater attention to the link between household level variables and child well-being indicators, drawing on insights from literature on poverty and intra-household dynamics. Given that there have been few social impact analyses of the WTO accession to date (Hague and Nguyen, 2005), and that a growing body of literature suggests that well-designed economic policies can alleviate manifestations of childhood poverty (eg, Waddington, 2004), we see this as an important contribution to the current policy discussions around the WTO accession process in Vietnam.

The paper is organised as follows. Section 2 discusses the theoretical framework and reviews relevant empirical literature on Vietnam. In Section 3, we briefly review the main changes in Vietnam's trade regime since the initiation of the *Doi Moi* (Renovation) set of economic reforms in the mid-1980s. Section 4 provides a brief overview of the Young Lives Vietnam dataset – both its advantages and limitations. In Section 5, we examine the relationship between trade liberalisation and child labour. Unlike the existing literature, we model children's involvement in domestic chores separately from other forms of labour. In Section 6, we examine the potential impact on children's educational achievement (including parents' ability to pay for extra tuition classes, a major policy issue in Vietnam). Section 7 investigates the relationship between changes in the household economy and determinants of children's health status. We discuss the conclusions and policy implications of our findings in Section 8, as well as suggesting directions for future research.

2. Conceptualising linkages between trade liberalisation and child well-being

This section briefly outlines a framework to understand the conceptual linkages between trade liberalisation and child well-being, relying heavily on frameworks by Waddington (2004) and Anderson *et al.* (2005) (see Figure 2.1). As suggested by Anderson *et al.* (2005) and Winters *et al.* (2002) and evidenced by a large literature on the linkages between globalisation, trade openness/liberalisation, economic growth on the one hand and the distribution of inequality and poverty reduction at the household level on the other, the task of tracing micro-level effects is complicated.⁷ The endeavour is even more challenging when we seek to disaggregate the effects within the household. Measures that either aggravate or ameliorate aggregate household poverty may have diverse impacts on men and women, girls and boys. Intra-household differences are dependent upon social and legal factors including the gendered composition of the labour market, (un)equal access to credit markets and legal rights regarding land title and ownership, inheritance, etc and cultural norms and practices surrounding the intra-household division of labour, assets and decision-making (eg, Ansell, 2005; Kabeer, 2003, Folbre, 2002).

As depicted in Figure 2.1, trade liberalisation may affect child well-being through two main channels. The first is through its impacts on household livelihoods and the ways in which households respond to economic opportunities (or loss thereof) resulting from trade liberalisation. The second channel involves the spillover impact of trade liberalisation on the accessibility and affordability of key public services essential for child well-being, such as health and education facilities.

The approach involves disaggregating the linkages between trade liberalisation on children as follows: (a) the effects of policy changes on a country's trade regime and, in turn, [ok?]on wages and employment opportunities, prices of goods and services and government expenditure patterns; (b) the effects of these macro-economic variables on household income, labour supply, and access to public services; and (c) the impact of these household-level variables on child well-being (mediated by the intra-household division of power and resources, the division of labour and preferences/values).

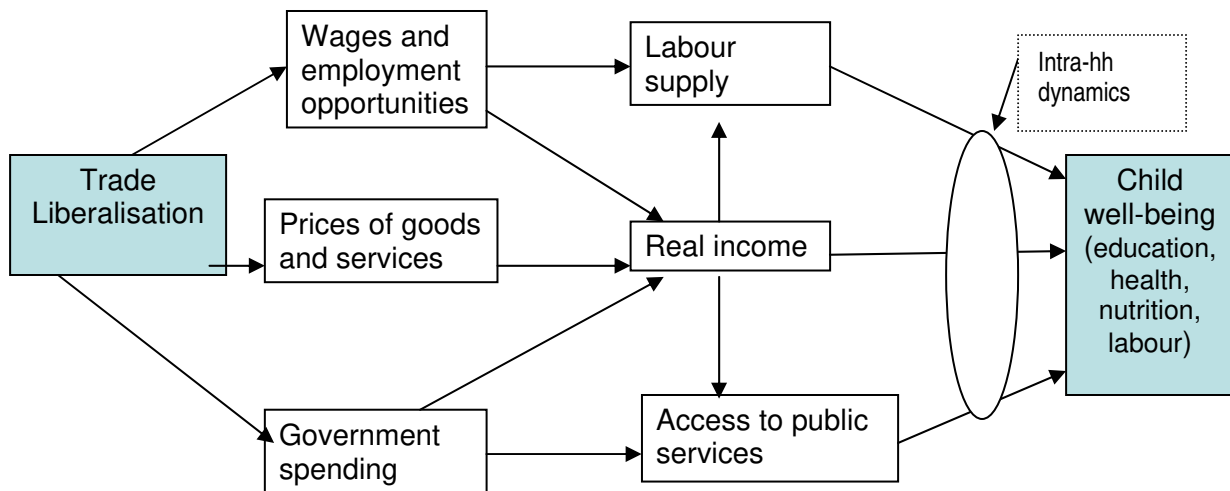


Figure 2.1: Linkages between trade liberalisation and child welfare
Adapted from Waddington (2004) and Anderson *et al.* (2005)

Following Anderson (2005), we begin from the micro-level and build up towards the macro-level.

(a) Effects of changes in household level variables on children

Changes in household labour allocations, access to services and income may affect children in three main ways: spending on children, children’s involvement in work activities and the quantity and quality of the care they receive.

Spending on children

It is generally assumed that increases in family income have a direct and positive impact on children. Although it is often the case that children in higher-income families have access to more and better quality food, education and health services, the impact is not necessarily linear, particularly in the context of credit and labour market imperfections (Ranjan, 1999, 2001; Jafarey and Lahiri, 2002). Feminist analysis has also shown that gendered intra-household dynamics play an important mediating role. Thus impacts on children are likely to be shaped by: women’s positioning within the labour market;⁸ their relative balance of power in terms of access to household resources; and decision-making and their time allocation between productive and reproductive tasks (eg, Ellis, 2003). For example, empirical evidence to date suggests that in female-headed families or those where women have equal decision-making power, rising income is more likely to be spent on improving children’s well-being (Hobcraft, 2000). By contrast, male heads of households often spend increased earnings on individual expenses such as alcohol, tobacco and affairs or sex workers (eg, Kabeer, 2003).

Children's time use

An increase in income for adult family members may also lead to a reduction in the demand for child labour. As the household has more resources available for current consumption needs, parents often invest in their children in order to improve their offspring's future well-being (which may include support for parents in their old age). In such cases, children's involvement in work activities is reduced so that they can devote more time to schooling and studying in order to increase their human capital and hence future earnings. For example, Behrman and Knowles (1999) found there was a positive link between parental income and children's scholastic achievement. However, an increasing body of literature suggests that this decline in child work is subject to significant threshold effects. Research by Edmonds and Turk (2004) suggests that once a country reaches an average gross domestic product (GDP) per capita of US\$5,000, child work falls rapidly. However, in developing countries increased family income may result in a greater demand for child labour, as the increased income may be used as start-up capital for small enterprises that rely on unpaid family labour; in the case subsistence agriculture, greater income, particularly through credit programmes, may lead to the purchase of livestock, for whose care children are made responsible (eg, Woldehanna *et al.*, 2005; Dammert, 2005). In order to mitigate such pressures, concerted government policies to encourage schooling may be necessary, and even then children often have to juggle both school and work, frequently to the detriment of educational achievement (Heady, 2003; Rosati and Rossi, 2003). However, in the case of Vietnam, Rosati and Tzannatos (2000) and Edmonds and Pavcnik (2004a) found that a rise in household income stemming from increased prices of export commodities was positively correlated with schooling but negatively correlated with the incidence of children's involvement in work.

Care of children

Changes in household income are also likely to affect what the gender and development literature terms 'reproductive labour' or 'caring work' – that is, time available for domestic responsibilities, including childcare. If children are considered as part of the household labour force, even if they are not required to engage in more paid work, they may need to shoulder more domestic tasks to compensate for reduced adult (typically women's) time in the home (Hanushek and Lavy, 1993). In short, if trade liberalisation results in greater aggregate household income, it is likely to be a necessary but insufficient condition to improve child well-being.

Children's health and nutrition

Other authors (Wagstaff and Nguyen, 2002; Ponce and Gertler, 1999; Glewwe *et al.*, 2003; Wagstaff *et al.*, 2000) have been concerned with changes in children's survival rate and nutritional status in the process of economic liberalisation. Drawing on Vietnamese Living Standard Survey data, Wagstaff and Nguyen (2002) found that liberalisation had led to a reduction in child mortality rates but that these reductions had been unevenly distributed. Children from better-off families have seen significant improvement in their survival prospects compared with children from poorer families. In the case of children's

nutritional status, Hop and Khan (2002) argue that there have been significant declines in child malnutrition as higher incomes from economic growth have led to improved household food security and nutritional intake. Glewwe *et al.* (2003), however, found that increased household income in the 1990s as a result of liberalisation made only a small contribution to improved child nutrition and instead it was the investment of higher government revenue and investments in better public health services that had a more significant impact in terms of combating child malnutrition. However, as argued by Ponce and Gertler (1999), opening up the healthcare market to the private sector (as part of the market opening) may be detrimental to child growth, because it may put good-quality healthcare beyond the reach of poor households. In short then, the net impact of economic liberalisation on child nutrition remains unclear.

(b) Impacts of macro-variables on the household

Changes in prices of goods and services brought about by trade liberalisation affect both nominal and real household incomes. According to trade theory, a central feature of trade liberalisation is that prices tend to move together as a result of competition: prices of imported goods fall and those of exported goods rise, at least relative to each other. According to Winters (2000a and b), the direction and strength of these effects will depend on whether the household is a net buyer or seller of the goods and services concerned. In the case of Vietnam, for example, when the government decided in the early 1990s to lift its export restrictions (export quotas) on rice exports, the volume of rice trade nearly tripled, while domestic rice prices increased by over 40 per cent (Edmonds and Pavcnik, 2004 a). However, for the net buyers of rice, the higher price of rice has had an adverse impact, especially in the case of the urban poor.

(c) Effects of changes in national trade regimes

Trade liberalisation affects three broad macro-level variables: domestic prices, wages and employment opportunities, and government spending. Changes in prices usually result from two opposing trends: a fall in the price of imported goods due to a reduction in tariffs, and an increase in exported goods due to greater market opportunities (Winters 2003; McCulloch *et al.*, 2002[CHANGED]).

The impact of trade liberalisation on employment and wages is mediated through its impact on economic growth. In theory, trade liberalisation leads to greater alignment between the country's economic structure and its competitive advantages. Assuming flexible wages ensure the labour supply meets demand as well as perfect mobility of workers across sectors, the Stolper-Samuelson theorem states that the relative price of exports will increase to reward those types of labour that are used intensively in producing exports and reduce wages of labour used intensively in import-competing sector. We also know from trade theory that greater exposure to trade tends to raise real income derived from abundant factors (capital or labour, depending on the context) and reduce the real incomes of scarce factors. In developing countries with abundant unskilled labour, such as Vietnam, then we would expect that trade liberalisation to be a force for reducing inequality by raising the real wages of the unskilled (Cigno *et al.*, 2004). In Vietnam, trade liberalisation has benefited rice farmers, who in general are

unskilled (Minot and Goletti, 2000; Justino and Litchfield, 2002; Niimi *et al.*, 2003; Jenkins, 2002). To the extent that trade liberalisation expands markets and opportunities, there is likely to be a greater willingness to invest in capital and education, which has positive impacts on employment and poverty (Seshan, 2004, 2005, Cigno *et al.*, 2004).

Liberalisation may affect government revenue and expenditure, owing to changes in tariff structures. Typically in developing countries, revenues from import tariffs and export taxes are an important source of government revenue. For Vietnam, revenue from trade taxes accounts for over 20 per cent of total revenue (UNDP, 2005). If a reduction of tariffs leads to a decline in revenue, the scope for government expenditure will also narrow. This in turn can be seen as a reduction in capacity to have pro-poor interventions. Theoretically, however, the effects of trade liberalisation on government revenue depend on the size of the tariff cuts and the broader reaction of the economy. Reduced tariff rates may lead to a larger increase in trade volume, or an increase in trade tax compliance (eg, Jensen and Tarp, 2000). In addition, governments may resort to alternative means of raising revenue, and the question of how to recover potential revenue loss is a key concern for many Asian countries. A common strategy for governments in Asia has been to strengthen the implementation of broad-base taxes such as value-added taxes (UNDP, 2005). Vietnam is no exception; it has recently introduced value-added taxes.

3. Evolution of Vietnam's trade regime

Trade liberalisation and the pursuit of integration into the regional and world economy have played a pivotal role in Vietnam's rapid and successful economic reform process. Since the inception of the *Doi Moi* policy in 1986, the trade policy regime in Vietnam has undergone significant changes, in three particular ways: (a) lifting restrictions on trading rights (the right to import and export); (b) reductions in non-tariff-related trade barriers and (c) tariff reductions (see also Appendix A).

(a) Lifting restrictions on trading rights

Removing restrictions on trading rights (the right to import and export) represents one of the key breakthroughs in trade reforms in Vietnam. Before 1986 state-owned enterprises (SOEs) had a monopoly over international trade. In 1986 restrictions on international trade were relaxed to a degree but non-state-owned enterprises still found the trade regime severely restrictive. Even in the early 1990s, only licensed trading companies were allowed to export and import. These restrictions were gradually relaxed with the removal of regulations on foreign trade contracts and shipment permits in 1996. The year 1998 saw a significant further reduction in the entry barriers to international trade with the removal of the licensing requirements for exporting and importing thanks to the issuance of the Commercial Law in 1997 and Decree No. 57/1998/ND-CP which allowed all enterprises with business licences to engage in foreign trade in the goods specified in their business licence without having to request an import/export licence.⁹ Another significant step was made in 2001 with the Decree 44/2001/ND-CP allowing all legal entities (companies and individuals) to export most goods without a licence.

b) Non-tariff measures

Vietnam introduced non-tariff measures (NTBs [non-trade barrier]) when it moved from a centrally planned economy to a more market-based economy, but since the mid-1990s has significantly reduced the use of NTBs in its attempt to integrate into the world economy. In July 1995 Vietnam became a member of the Association of South East Asian Nations (ASEAN) and subsequently a member of the ASEAN Free Trade Area (AFTA), whereby the government committed itself to eliminating many of its NTBs. Another significant step towards international economic integration was in 2000 when Vietnam signed a bilateral trade agreement (BTA) with the USA. Under the terms of the BTA, Vietnam agreed to phase out all non-tariff barriers, including import and export restrictions,¹⁰ quotas and control over a period of three to seven years.

Although quantitative restrictions or import quotas historically served as a major instrument to shield state-owned enterprises from import competition, by 1998 only nine major products were still subject to import quotas and by 2005 just two products remained on this list: sugar and petroleum.¹¹

Finally, special authority regulations exist which before 2001 required importers to get approval from relevant ministries and agencies. Since 2001, there have been only seven relevant ministries and agencies responsible for overseeing the minimum quality/standard for imported goods. As in many countries, they are used generally for health and security

reasons, and goods that meet the minimum standards can be imported without any further restrictions.

c) Tariffs

An important aspect of trade barriers is the tariffs imposed on imported goods. Vietnam's tariff schedule was first introduced in 1988 and was then rationalised in 1992. Tariffs were further simplified in 1999, following Vietnam's accession to AFTA and in preparation for WTO accession. On 1 September 2003, Vietnam implemented the ASEAN Harmonised Tariff Nomenclature, which is based upon the international Harmonised Tariff System of 2002.¹² In implementing the new tariff system, the government of Vietnam raised tariff rates on 195 items and reduced them on 106. Currently, there are three sets of tariff rates: most-favoured nation (MFN) rates, which apply to about 75 per cent of total imports from countries that have normal trade relations with Vietnam; common effective preferential tariff (CEPT) rates, which apply to imports from ASEAN countries; and general tariff rates, applicable to all other countries. Since the beginning of trade liberalisation, tariff protection has fallen significantly. According to a study by Nguyen (2004), the unweighted average tariff rate was about 16 per cent in 2002 and comparable to that in neighbouring countries such as Thailand, China or Indonesia. The number of tariff lines and the maximum tariff rates have also decreased.¹³ Under its WTO obligation, Vietnam is committed to reducing its average tariff rate to 13.4 per cent over a period of five to seven years following accession.

4. Young Lives Vietnam data analysis

The data used in this section of the paper are from the Vietnamese component of the 2002 Young Lives survey on childhood poverty.¹⁴ As our purpose in this paper is to trace the potential link between trade liberalisation and manifestations of child poverty (such as children's time use, scholastic achievement, health and nutritional status), we used data from a cohort of 1,000 children who were aged between 7.5 and 8.5 years in 2001 – the so-called 'eight-year-old cohort'.¹⁵

Limitations

In order to evaluate the impact of trade liberalisation on child well-being, ideally we would have two datasets collected in the pre- and post-reform periods. Unfortunately, such a dataset is not available¹⁶ and this paper is therefore conceptualised as the first part of a longer-term research endeavour which will examine the impacts on child well-being of trade liberalisation to date and then post-WTO accession.

Faced with this limitation, we have to resort to information about respondents' perceptions of changes in household livelihoods. The Young Lives dataset contains questions about whether respondents' living standards have increased or decreased or stayed the same during the last three years; and whether the household has suffered any negative event. We employed these indicators in our analysis.

Another data limitation is the lack of variables in the first round of the Young Lives survey on household income, expenditure or consumption. To overcome this difficulty, we constructed a wealth index for each family using information about durable goods available in the family. Details of the construction of this index are outlined in Appendix B.

Finally, as discussed in Tran *et al.* (2003), the sampling method adopted in the Young Lives Vietnam project is a variant of a stratified sampling approach, and poor communes are over-represented in the sample. However, there is no information as to the relative weighting assigned to respondents in the data. Therefore, the estimates reported in later chapters are unweighted estimates, and should be interpreted with due caution.

5. Child labour – household chores and extra-household work

5.1 Introduction

Recently the potential impact of globalisation on the incidence of child labour has attracted attention from both the Vietnamese public and academics. Although there is consensus that poverty is a key contributing factor (Basu 2004, and Basu and Van 1998[CHANGED], Neumayer and Soysa, 2005 [reference added] Edmonds and Pacvnik, 2004a, 2004b)), too little is yet known about how trade liberalisation will affect children’s engagement in work. In this section we use a multinomial logit model to model children’s involvement in work and chores. Whereas most research on child labour to date has focused on ‘work for pay, work in formal household and work in agriculture’ (Edmonds, 2005b) and ignored household domestic chores, we include household chores, because this type of work may be equally taxing on children’s physical and mental health and constrain children’s available time for education and leisure (eg, Woldehanna *et al.*, 2005; Van, 2005). Given our conceptual framework, which argues that the impact of trade liberalisation will be mediated through household-level variables, this section looks at the determinants of child labour. We first outline the econometric methods and discuss the data and independent variables used in estimating the work–chore decisions. We then discuss the estimation results and conclusions.

5.2 Econometric modelling

For child labour, we can identify whether the sample children are working for pay, helping with domestic chores or not engaged in any type of work. Instead of estimating a binary logit model, we model child labour using a multinomial logit, distinguishing between work for earnings and domestic chores (see Appendix C for details).¹⁷

Table 5.1 depicts the distribution of children by their work–chore status.¹⁸ It shows there are differences between male and female children: 18.5 per cent of boys do not work and do not do any chores within the household, while the corresponding figure for girls is only 7 per cent. Among boys engaged in work, 63 per cent are involved in domestic chores while for girls the proportion is higher – 74 per cent. Boys and girls engaged in both chores and extra-household activities account for 16.5 per cent and 18 per cent respectively.

Table 5.1: Work–chores status of 8-year-old children

		Not work not chores	Chores but not work	Work and chores	Work not chores	Total
Male	Frequency	93	318	83	8	10000
	Percentage	18.53	63.35	16.53	1.59	100%
Female	Frequency	35	370	90	3	10000
	Percentage	7.03	74.3	18.07	0.6	100%
Total	Frequency	128	688	173	11	10000
	Percentage	12.8	68.8	17.3	1.1	100%

Note: Authors' calculation using the 2002 Young Lives 8-year-old cohort data.

In order to give a fuller picture of children's involvement in work and domestic chores, Table 5.1a shows the frequency of months worked and hours spent on domestic chores. As indicated in Table 5.1a, for those working, a majority of working children spend less than three months working per year, while most of those involved in domestic chores spend less than three hours a day.

Table 5.1a: Frequency of months worked and hours spent for chores

Months worked per year	Freq.	Per cent	Hour for chores	Freq.	Per cent
1	10	6.29	< 1 hours	364	42.28
2	12	7.55	1	291	33.8
3	18	11.32	2	129	14.98
4	6	3.77	3	37	4.3
5	8	5.03	4	29	3.37
6	4	2.52	5	5	0.58
7	3	1.89	6	5	0.58
8	4	2.52	7	1	0.12
9	4	2.52			
10	5	3.14			
11	1	0.63			
12	84	52.83			
Total	159	100		861	100

In the Young Lives dataset, as indicated in Table 5.1 above, there are four alternatives for the parents to choose from: J=1: Neither work nor chores; J=2: Chores only, ie, domestic work only; J=3: Work and chores; J=4: Work but not chores. Ideally we should estimate a 4-state multinomial logit model. However, owing to the small number of children observed in the alternative J=4, causing a numerical problem in estimating such a 4-state multinomial logit model, we instead estimate a 3-way multinomial logit model (see Appendix C).

5.3 Variables

The variables that may influence the probability of a child working or doing domestic chores include: (a) children's individual characteristics; (b) household-level variables; and (c) community-level characteristics. We discuss these groups of variables below and provide descriptive statistics in Table 5.2.

(a) Child characteristics

These characteristics, which include gender, age, ethnicity, and birth order, are often used in the modelling of child labour. As we are using the eight-year-old child cohort dataset, we can only control for gender, birth order and ethnicity, and not for age differences. As the effect of gender (MALE) on the work–chore decision is not unambiguous, it will be

determined in the empirical analysis. As for ethnicity (KIDETHNIC), although there are a number of ethnic groups in the data, we only include a dummy indicating whether child i belongs to the Kinh ethnic group or an ethnic minority group. This is because the number of observations for ethnic minority groups is small. There is no obvious priori to speculate on the effect of the variable. Children from the Kinh ethnic group may appear to have a higher participation rate in schooling and lower participation rate in the labour force. However, this may be due to higher household income and access to education facilities. Again the differences between ethnic groups are left for the empirical exercise. With respect to birth order (ORDER), being a first child born would mean having better chances of accessing full parental attention and household resources without sharing with other siblings. On the other hand, the probability of having to work would increase with age and being the first child born may also mean that the eldest child within the family is more likely to be involved in work – both domestic and extra-household work. As argued by Rosati and Tzannatos (2000), parents allocate their children's time among different activities on the basis of their realised fertility decisions. Again, this issue needs to be assessed empirically.

(b) Household-level variables

These variables include household characteristics such as family income, family structure, parental schooling, occupations, and employment status.

First, family income as argued above is obviously an important determinant of whether a child would become involved in employment. In the Young Lives Vietnam dataset, there is no information regarding income. We instead constructed a wealth index (WEALTHINDEX) to proxy for family income. As argued by Edmonds (2003a and b), child poverty in general and child labour in particular is a problem of household poverty. Children from better-off families would have a lower probability of having to work to contribute to household consumption. We expect the variable WEALTHINDEX to be negatively related to child labour.

We also include a number of covariates in the model to capture the economic background of the household. They include whether the family owns the house they are living in (OWNHOUSE), whether the family owns land (OWNLAND), whether the family is in debt (DEBT) and the number of rooms in the house (NUMROOM). We expect these variables to be negatively related to child labour and chores.

Parents' own schooling may influence whether they send their children to school or to work. The education level of parents is likely to be closely related to the amount of parental encouragement with respect to investment in education received by their children. Children born to more highly educated parents are expected to have a greater chance of schooling than of working. However, the effect on domestic chores is not unambiguous and this will be determined in our empirical analysis. In our model, parental schooling is measured by maternal education (MUMEDU) and paternal education (DADDEDU). We expect child labour to be negatively related to the level of parental education.

Recent empirical literature (Rosati and Tzannatos, 2000) has shown the importance of the household structure and of the presence of siblings for child work decisions. The number of siblings in the family may affect the probability of a child working, going to school or doing domestic chores. The importance of this variable derives from a belief that there is a trade-off between child quality and quantity. Families are seen as solving a constrained maximisation problem. Families' utility is maximised with respect to the quantity and quality of children as well as other 'goods', but constrained by financial resources and time. The trade-off exists since parents' resources and time are limited and must be spread more thinly with more children (eg, Becker and Tomes, 1979; Behrman and Knowles, 1999. ;[neither is in – YES, THEY ARE BOTH IN THE REFERENCE] Hanushek, (1992)]). Children within a family are assumed to compete for scarce resources and parents are assumed to allocate time and other resources to maximise the objective function. The theory implies that a reduction in the number of children will free resources for current consumption (of both parents and children). If this reduction is large enough, parents will transfer some surplus resources to future consumption, by reducing the labour supply of their children. In our empirical analysis we control not only for the number of siblings (NUMSIB) but also for the number of boys born (BOYBORN) and girls born (GRLBORN). For family structure, we include an indicator for female-headed families (FEMALEHEAD). It is expected that children from female-headed households will be worse off than those with male household heads, owing to the feminisation of poverty, and this may therefore affect the probability of children being involved in chores or extra-household work.

As negative events (which may or may not be a result of trade liberalisation) could affect the work–chore decision of the household, we include in our model indicators related to a family's experience of any negative events (NEGATIVE EVENT). We expect that the negative event may force a child into labour. As argued by Rosati and Tzannatos (2000), if the parents are altruistic, then they may shield their children from the effects of negative events by re-allocating domestic resources. However, we believe this is an empirical issue.

The dataset also contains a number of indicators for different types of negative events that result in a decrease in food availability, loss of income, or migration. We are unable to use indicators for individual negative events such as a decrease in the availability of food (99.5 per cent of respondents reporting no decrease in food availability) or migration status (98.4 per cent respondents reporting non-migration status) because of insufficient variation in the data. We do, however, include an indicator for negative events leading to loss of income (HHJOB) and expect that this will increase the probability of child labour.

We also include in our model variables indicating whether the economic living standards of the household have increased (LIVEUP) or decreased (LIVEDOWN) during the last three years. Although the increased or decreased living standard cannot be attributed directly to trade liberalisation, trade liberalisation may affect the probability of child labour if it leads to changes in household living standards.

(c) Community characteristics

A number of community level and macro-level variables are used in our model. First, we expect that an increase in the direct cost of education will reduce schooling in favour of labour for at least some children. We therefore include the information on cost of primary education (PRIMACOST) at the community level in our model. The percentage of poor families in the commune (POORFAM) may affect child labour. Distance to school may also affect child labour. The farther the school from the household, we expect the more likely that children would be involved in child labour. We control for distance to school in our analysis (SCHDIS3). We also hypothesise that the presence of a factory in the neighbourhood would increase the chance of child labour, and we control for this (FACTORY). We also include a series of dummy variables for different provinces (PHUYEN, BENTRE, LAOCAI and HUNGYEN). In an attempt to link the changes in the trade-induced macro-level variables which we think might have some impact on child welfare, we have included in the model the GDP growth rate for the period 1999–2002 for five provinces.¹⁹

5.4. Discussion of estimation results

The estimation results are presented in Table 5.3 in Appendix C. In terms of child characteristics, statistically there is some evidence of preference towards boys. Boys are 11 percentage points more likely than girls to be involved in neither work nor chores (j=1) and less likely to do domestic work (j=2). However, there is no evidence of preference towards boys in the third alternative, ie, combining work and chores. Ethnic differences also emerged from the data but in a surprising direction. Kinh children (KIDETHIC) were found to be more likely to be involved in domestic chores than ethnic minority children (j=2) but less likely to be involved in the first alternative (neither work nor chores). Birth order also emerged as statistically significant – so younger children are less likely to be involved in work activities than their older siblings and more likely to engage in domestic chores.

In terms of the effects of household characteristics on children's work–chore combination, children in female-headed households (FEMALEHEAD) were found to be less likely to do domestic work (chores) only. However, they were found to be 9.3 percentage points more likely than children from male-headed families to combine chores and extra-household work.

Parental education seems to have an effect on children's engagement in work activities. It is worth noting, though, that the level of parental education in our sample is relatively low – among parents of the eight-year-old child cohort, 90 per cent of parents had only a grade 4 level education and the highest level attained was grade 9. As paternal education levels rise (DADEDU), children are more likely to be involved in chores than sit idle, whereas the variable for maternal education (MUMEDU) was not statistically significant.

Other household characteristics were included in the model to control for household size and family structure (BOYBORN, GRLBORN, NUMSIB). The number of siblings did not have any effect. The number of boys born seems to decrease the probability of children sitting idle (j=1) and increase the probability of involvement in chores (j=2). The

number of girls born in the household does not have any effect on the work–chore combination.

Contrary to our hypothesis, however, the wealth index – which we used to proxy the impact of poverty on child labour – did not emerge as statistically significant, suggesting that family wealth does not affect the work–chore choice of children. In a cross-regional study, Edmonds and Turk (2004) suggest the possibility of a threshold effect operating here.²⁰ Similarly, in other micro-econometric studies by Woldehanna *et al.* (2005) for Ethiopia and by Dammert (2005) for Peru, there is strong evidence of nonlinearity in the relationship between wealth/income and child labour and schooling.

Other variables were also included in the model to control for family economic background such as whether the family is currently in debt, the number of rooms per house, house and land ownership. But these variables were also not statistically related to the child work–chore decision. However, given that none of these economic-related variables is a perfect substitute for income and expenditure, it seems important that in subsequent rounds of Young Lives, more detailed information on income and expenditure should be collected.

Economic shocks may influence the child work–chore decision through their impacts on the household. However, the two variables included to control for such effects – whether there is any negative event (NEGATIVEEVENT) and whether that event caused income/job loss (HHJOB) – are not statistically significant. This is a very interesting result, suggesting that in the face of negative events, families may take measures to shield their children from the adverse consequences of such shocks. While more detailed in-depth analysis of intra-household dynamics is clearly called for, in order to explore this dynamic further in this paper, we look at household responses to various shocks (see Table 5.4). Again, the results are interesting: taking children out of school to cope with economic shocks emerged neither as a first- nor a second-choice coping response. In fact, the number of households that resorted to this measure was very small (0.33 per cent). Moreover, only a very small proportion of households consider sending their children to work as their response strategy in case of economic shocks.

Table 5.4 Response strategies by family in the case of economic shocks

	Response Strategy 1		Response Strategy 2		Response Strategy 3	
	Freq.	Per cent	Freq.	Per cent	Freq.	Per cent
Nothing	28	4.66	355	59.07	561	93.34
Sell things	17	2.83	9	1.5	-	-
Use savings	44	7.32	8	1.33	2	0.33
Use credit	226	37.6	41	6.82	2	0.33
Eat less	11	1.83	19	3.16	10	1.66
Buy less	11	1.83	14	2.33	9	1.5
Work more/start work	174	28.95	85	14.14	6	1
Take children out of school	-	-	-	-	2	0.33
Send children to work	1	0.17	3	0.5	-	-

Fled/moved away from problem	1	0.17	1	0.17	1	0.17
Migrated to work/find work	14	2.33	3	0.5	2	0.33
Received help from relatives/friends	37	6.16	38	6.32	3	0.5
Received help from government/NGO	11	1.83	12	2	1	0.17
Insurance paid	-	-	1	0.17	2	0.33
Other: specify	26	4.33	12	2	-	-
Total	601	100	601	100	601	100

In the model, we included indicators as to whether the living standard of the household has increased (LIVEUP) or decreased (LIVEDOWN) during the last three years.²¹ The estimated coefficient of the variable LIVEUP is not statistically significant, which implies that increased household living standards do not affect choices relating to children's engagement in work activities. However, the coefficient of the LIVEDOWN variable was statistically significant for alternatives 1 and 3. This result indicates that if household living standards decrease, children are 6.9 percentage points less likely to be not working or involved in chores, but at the same time the probability of children combining chores and extra-household work increases by 6.4 percentage points.

Evidence to date suggests that the Vietnamese trade liberalisation process has increased overall household incomes and has not led to a decline in living standards for the poor in general (Thonburn and Jones, 2002). Nevertheless, it is still expected that trade liberalisation will create some winners and losers. For the winners, we hypothesised that a decline in child labour would be more likely. However, the results from the Young Lives dataset indicate that the incidence of child labour has not declined as living standards have improved. It should be remembered, though, that our results refer only to a cohort of eight-year-old children, and broader generalisations should be made with caution. For the losers, our results indicate that decreased living standards increased the probability of children's greater involvement in work activities. This is worrying as a growing international body of literature suggests that children deprived of educational opportunities are more likely to remain poor into adulthood and in turn pass on their poverty status to their children, in a process termed the intergenerational transmission of poverty (eg, Harper *et al.*, 2003).

Finally, we turn our discussion to community-level variables. We hypothesised that the accessibility of school measured by physical distance to school (SCHDIS3) and financial expenses (PRIMACOST) would increase the probability of a child working. However, the estimated coefficient of this variable was not statistically significant. This may be largely attributed to the fact that only 1.2 per cent of the sample children had never attended school and just 3.3 per cent did not attend school the previous year. The proportion of poor households per community had a statistically significant effect on the probability of a child doing domestic chores but decreased the probability of a child working outside the household. The reason may be that children in poorer communes

may have fewer employment opportunities, and thus the only way they can contribute to the household livelihood is through involvement in domestic chores.

We also hypothesised that the presence of a factory close to the commune may induce children into work (either in the factory or in related supporting units), but this variable emerged as statistically insignificant.

There are also regional differences with respect to the patterning of child work. Children from Phu Yen and Ben Tre provinces are less likely to be involved in domestic work only ($j=2$) and more likely to get involved in work both outside and inside the household ($j=3$). Children from Lao Cai and Hung Yen provinces are less likely to sit idle than their counterparts and more likely to get involved in chores and external work (see Alternative 3 in Table 5.3, Appendix C).

5.5 Summary

In our analysis using Young Lives data, we did not find a significant statistical relationship between improving household prosperity and a reduction in child work activities. This suggests that a threshold effect may be in operation and that the improvements in household living standards recorded by Young Lives households may not have been significant enough to have a positive spillover impact on child labour. Indeed the cross-regional research by Edmonds and Turk (2004) discussed above would suggest that this threshold is related to an average GDP per capita. However, falling living standards increased the probability of children's engagement in domestic and extra-household work. This indicates that social impact analyses of post-WTO accession in Vietnam should pay careful attention to the well-being of vulnerable groups whose livelihoods are likely to be negatively affected by trade-induced shocks, in both the short and the medium term.

Whether children's involvement in work has any negative spillover impact on other dimensions of their well-being, such as educational attainment and health status, is addressed in the following chapters.

6. Children's schooling and academic attainment

6.1 Introduction

Education is an important investment in human capital and endows children with the means to improve their skills, knowledge, health and future real incomes (eg, Becker, 1962). Human capital can be broadly defined as 'an individual's productive skills, talents, and knowledge' (Thurow, 1970: 1) and people invest in human capital to benefit from it in both monetary and non-monetary terms. Vietnam has a long tradition of respect for education and its 90 per cent literacy rates and school enrolment levels were among the highest in Southeast Asia in the 1980s (Swinkels and Turk, 2003). However, during the mid-1990s, school enrolment levels declined, and there were high drop-out rates in the final years of primary school.²² Some attribute this falling enrolment and rising drop-out rates to economic reforms which resulted in a shrinking education budget and led to a rise in private tuition (Liu, 2001a; Hong, 2000). Vo and Trinh (2004) point out that budget constraints are hindering improvements in the quality of education and training systems in Vietnam. However, recently there has been significant improvement in drop-out rates, which have decreased from 27.7 per cent in 1993 to 12.4 per cent in 2002 (Vo and Trinh, 2004).

In this section we focus on educational achievement among the Young Lives eight-year-old cohort as there is negligible variance in enrolment rates in our sample.²³ We look at two dimensions of achievement. First, we examine the determinants of children's scholastic achievement as measured by simple reading, writing and numeracy skills tests. Second, we look at an important and idiosyncratic feature of the Vietnamese schooling system – private tuition. Investing in private tuition is increasingly common even among poor households, as indicated in Table 6.1. We believe that this is a useful indicator of households' willingness to invest in the human capital development of their children.

We also assume that the impacts of trade liberalisation on child welfare will be channelled through household- and/or community-level variables. If trade liberalisation leads to income growth and increased fiscal spending on educational facilities, then we expect positive impacts on child well-being. In addition, we also address the question raised in the previous section as to whether child labour has adverse consequences on other dimensions of children well-being, namely educational attainment and school attendance.

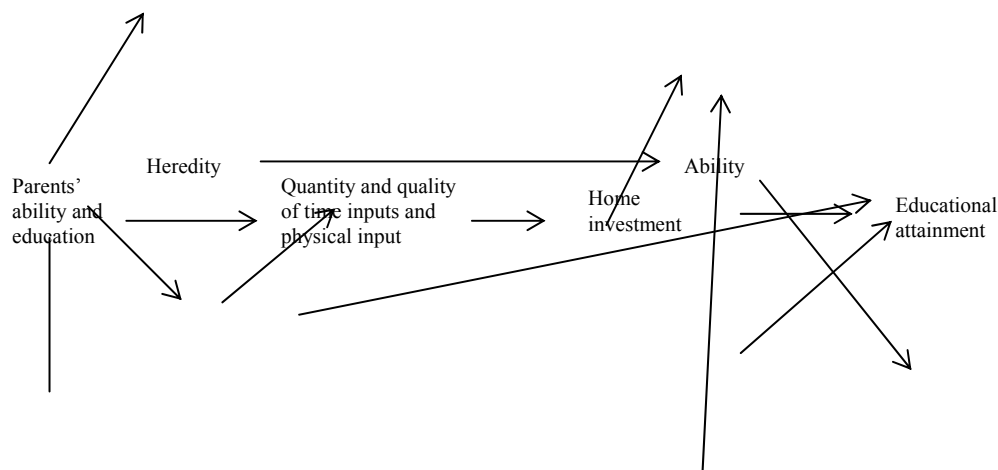
6.2 Theoretical considerations

Economic literature that models educational achievement is embedded in human capital theory and the household production model first introduced by Becker (1962) and later developed further by Leibowitz (1974), Becker and Tomes (1979, 1986) and Hanushek (1979, 1986). The educational production function has become the main construct of the empirical literature to identify the relative importance of measurable educational inputs. Analogous to factory production, this framework relates contemporaneous child cognitive

attainment with educational inputs from within the family and school. To facilitate our discussion, Figure 6.1 represents these factors diagrammatically.

In Becker's (1962) human capital model, people with different family backgrounds have different optimal levels of schooling. Family background is considered important because parents with more resources are more able to invest in their children. But the question remains, why do parents invest in their children? This question is addressed in the model of intergenerational transmission of human capital (eg, Becker and Tomes, 1986). Parents are assumed to care about the lifetime utility/welfare of their children and thus seek to influence their children's human capital. If they have sufficient assets or can borrow funds against their children's future income, they invest in the human capital of each child up to the point where the marginal rate of return on human capital equals the rate of interest. However, because human capital is poor collateral (Becker, 1962) in an imperfect capital market, parents cannot borrow as they would wish to finance investment in the schooling of their children. As a result, human capital investment is constrained by parents' wealth or income and students from less wealthy families are more likely to drop out because of greater financial constraints. In addition, conceptualising the family as a production unit, this framework posits that a child's educational attainment is also subject to parental decisions on fertility and household willingness to invest in human capital.

Although investment in human capital models advanced by Becker (1962)[CHANGED] and Becker and Tomes (1986) yield testable hypotheses with respect to the effects of family factors on the decision to invest in children and their scholastic achievement, these models offer little empirical guidance. In this vein, Leibowitz's model (1974) of human capital production (see Figure 6.1) provides an operational way to investigate educational achievement. In this model, parents' genetic endowments are passed on to their children, and in turn partly determine children's abilities. Parental education and ability influences family income levels and the quality and quantity of both time and goods invested in their offspring. This is termed 'home investment'. This model is silent, however, on the role played by school-related factors in producing human capital and thus we employ a modified version to compensate for this shortcoming.²⁴ The process of augmenting human capital in students also takes place at school. Resources and teachers' knowledge and skills are expected to be important in determining the process of augmenting human capital in students. As illustrated in Figure 6.1, school-related factors are subject to parental choice of school, which is influenced by parental ability, education and income.



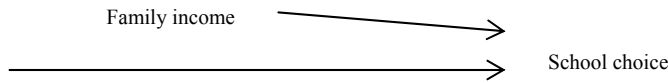


Figure 6.1: Home investment in children, adapted from Leibowitz (1974)

6.3 Model specification and data

Young Lives Vietnam collected data on children’s involvement in private tuition.²⁵ Of the eight-year-old cohort, 47.5 per cent had attended extra classes, as shown in Table 6.1.

Table 6.1 School attendance and private tuition

Ever attend school		Attend school last year		Receive private tuition	
Frequency	Per cent	Frequency	Per cent	Frequency	Per cent
12	1.2	33	3.31	525	52.5
988	98.8	964	96.69	475	47.5

Source: Young Lives Vietnam 2002

In terms of scholastic achievement, Tables 6.2 provides descriptive statistics on children’s numeracy, literacy and writing skills. Numeracy is measured as a binary variable indicating whether the child can complete a simple numerical task, with 66 per cent of the respondent children getting the answer right. Reading and writing skills are measured on an ordinal scale. Writing skills are measured on a three-level scale: (1) cannot write anything – 8.6 per cent; (2) can write with some mistakes – 17.12 per cent; and (3) can write well – 74.62 per cent. Reading skills are measured on four-level scale: (1) cannot read anything – 4.33 per cent; (2) can read letters – 3.42 per cent; (3) can read words – 4.53 per cent and (4) can read a sentence 87.73 per cent. Accordingly for private tuition and numeracy skills we use a simple binomial model.²⁶

For the writing and reading skills, as they are measured on an ordinal scale, we do not observe the actual skills, rather what we observe is

$$\begin{aligned}
 y &= 0 \quad \text{if} \quad y^* \leq 0 \\
 &= 1 \quad \text{if} \quad 0 < y^* \leq \mu_1 \\
 &= 2 \quad \text{if} \quad \mu_1 < y^* \leq \mu_2 \\
 &\dots \\
 &= J \quad \text{if} \quad \mu_{J-1} \leq y^*
 \end{aligned}$$

In this case, our modelling approach is also based on the latent variable model and we estimate an ordered logit model for these two educational attainment measures.

Table 6.2
Educational achievement as measured by writing, reading and numeracy skills tests

Writing skills (ordinal 1–3)		Reading skills (ordinal 1–4)		Numeracy skills (Binary)				
	Freq.	Per cent		Freq.	Per cent		Freq.	Per cent
Can not write	82	8.26	Can not read anything	43	4.33	Wrong	337	33.7
Write with mistake	170	17.12	Can read letter	34	3.42	Right	663	66.3
Write well	741	74.62	Can read words	45	4.53			
			Can read sentence	872	87.73			
Total	993	100		994	100		1,000	100

The choice of independent variables included in our models is shaped by the availability of data, economic theories and previous studies. Table 6.3 in Appendix D provides summary statistics of variables used in our regression. As before, we broadly group these variables into three groups: (a) child characteristics; (b) household characteristics; and (c) community-level variables.

(a) Child characteristics

These are often used in the modelling of children’s educational attainment. They include gender, age, ethnicity, and birth order. As we use the eight-year-old child dataset, we can only control for gender, birth order and ethnicity and not for age differences. As the effect of gender (MALE) on educational achievement is not unambiguous, it will be determined in the empirical analysis. As for ethnicity (KIDETHNIC), the data reveals that children from the Kinh ethnic group are more likely to receive private tuition than ethnic minority children (52 per cent versus 17.6 per cent). With respect to birth order (ORDER), being an early-born child suggests that one would have a better chance of accessing fuller parental attention and household resources without sharing with later-born children. The implication is that elder children would be more likely to attend extra classes and perform better academically.

(b) Household level variables

First, we use a wealth index (WEALTHINDEX) to proxy for family income, hypothesising that better-off families would have more resources to afford extra classes for their children (usually these extra classes are run by schoolteachers), and be able to provide more support for their children’s education.

We also include a number of covariates in the model to capture the economic background of the household. They include whether the family own the house they are living in (OWNHOUSE), are land owners (OWNLAND), in debt (DEBT), and the number of rooms in the house (NUMROOM). As proxies for household prosperity, we expect these variables to be positively related to a child receiving private tuition and performing better scholastically.

Parental schooling may influence their decision about whether to invest in private tuition and to support their child's education. Better-educated parents may be more willing to spend time to help their children with their studies, thus children born to more highly educated parents are expected to be more likely to have a private tutor and to do better on basic skills tests.

The number of siblings in the family may also affect school achievement. The underlying assumption is that there is a trade-off between child quality and quantity (Becker and Tome, 1979, 1986; Behrman and Knowles 1999; Hanushek, 1992). In our empirical analysis we control not only for the number of siblings (NUMSIB) but also for the number of boys (BOYBORN) and girls born (GRLBORN). For family structure, we include an indicator for female-headed families (FEMALEHEAD). It is expected that children from female-headed households will be worse off than children in male-headed households and this may lower their chances of attending private tuition classes and in turn performing well academically.

As negative events could affect household livelihoods and in turn children's access to extra tuition, we include indicators of families' experience of negative events (NEGATIVEEVENT). We hypothesise that negative events may lower chances of children receiving extra tuition and performing well academically. We also include in our model an indicator of negative events leading to a loss of income. We expect that this will lower the probability of parents investing in private tuition. We also include variables indicating whether household living standards have improved (LIVEUP) or declined (LIVEDOWN) during the last three years.

(c) Community characteristics

The following community and macro-level variables are used in our model. First, we expect increased direct costs of education to result in some parents cutting investment in private tutors for their children. We include the information of cost of primary education (PRIMACOST) at the community level in our model. The proportion of poor families in the community (POORFAM) may also affect the probability of children getting extra tuition. Distance to school may also affect child education. The farther the school from the household the less likely we think children will be receiving extra classes. We control for distance to school in our analysis (SCHDIS3). We also include dummy variables for different provinces (PHUYEN, BENTRE, LAOCAI and HUNGYEN), but these were automatically dropped by the STATA statistical package we employed, suggesting a problem of multi-collinearity.

6.4 Discussion of estimation results

6.4.1 Attending extra classes

Table 6.3 in Appendix D presents the estimation results for the model of receiving extra tuition. We estimated two specifications, one with the inclusion of indicators for a child's involvement in labour and domestic chores and one without. We do not find any significant differences between boys and girls nor among children from different ethnic groups. This latter finding is very interesting as the raw data indicates a marked difference between the two groups. It points to the importance of controlling for family background variables when considering differences among ethnic groups.

Turning to the household level variables, the results are striking. The most significant variables are related to economic status. The variable WEALTHINDEX is statistically significant with a large magnitude. This indicates that household prosperity is an important determinant of parents investing in children's educational development. This finding is consistent with findings reported by Behrman and Knowles (1999) using the Vietnam Household Living Standard Survey 1992/93.

The variables indicating economic shocks (NEGATIVEEVENT and HHJOB), however, were not statistically significant. Nor were they with the two variables indicating changes in the living standards of the family over the previous three years (LIVEUP and LIVEDOWN). Consistent with the findings on child labour, this result suggests that families seek to shield children from the negative effects of economic shocks.

At the community level, the proportion of poor households per commune was statistically significant. This implies that in poor communes, the trend of investing in private tuition is weaker. Other variables (distance to school and the cost of primary education) were not significant statistically.

Finally, we turn to variables reflecting children's labour status (CHORESONLY, WORKCHORE). The variable CHORESONLY is negative and statistically significant, indicating that the more a child is involved in domestic chores, the less likely she/he would attend private tuition classes. However, the variable WORKCHORE is not statistically significant, although it has the expected negative sign. In short, this suggests that if trade liberalisation results in an increase in child labour (both outside employment and domestic work) it may lower children's longer-term scholastic performance by lowering their chance of attending extra classes.²⁷

6.4.2 Educational attainment

Table 6.4 in Appendix D presents the estimation results for children's achievement in basic academic skills tests. We estimated three specifications which differ with respect to the inclusion of three variables, EXTRACLASS, WORKCHORE and CHORESONLY. We first discuss the results of specification 1. With respect to children's characteristics, there are no gender or ethnic differences on the numeracy skills test.

Turning to household variables, the gender of the household head and birth order were not statistically significant. Parental schooling, however, was found to have a positive impact on children's numeracy skills, although maternal education alone was not statistically significant. In terms of family structure, the number of siblings (NUMSIB) was negative but statistically insignificant, thus not supporting the quality–quantity trade-off hypothesis. The variables indicating a decreased living standard was statistically significant although the variable indicating increased living standard was not. Perhaps the single most important determinant of child's numerical skill attainment was the WEALTHINDEX variable, reaffirming the importance of economic background in shaping children's educational achievement. Nevertheless, economic shocks did not have an impact on numeracy test scores.

At the community level, distance to school, the proportion of poor households and the average cost of education in the community were all statistically insignificant.

We now turn to specification 2, which includes an indicator for attending extra classes. However, perhaps surprisingly, additional tuition did not have any beneficial effect on numeracy skill acquisition.

Specification 3 includes two indicators for children's involvement in domestic and extra-household work activities. However, surprisingly the involvement of children in labour and chores was correlated with superior numeracy skills. An explanation for this counter-intuitive finding might be that a more able child may be more likely to be asked by his/her parents to help with work activities and/or be more likely to find a job. The argument here would be that a self-selection process is in operation, with more able children juggling both work and education. Ideally, we should model this self-selection process through a bivariate model or instrumentation. However, owing to data limitations we were unable to find an appropriate instrument for the CHORESONLY and WORKCHORES variables. Although the results should be interpreted with caution, the conclusion here is that we do not find strong evidence that child labour and domestic chores have a negative impact on the development of children's numeracy skills.

Tables 6.5 and 6.6 in Appendix D report estimated results from ordinal logit models for children's writing and reading skills, respectively. In table 6.5 we report our estimation results for three specifications. The first specification does not include indicators for children's involvement in private tuition classes, work and chores. According to the estimated results, there were no significant gender differences in writing skills, but Kinh children performed better than ethnic minority children. Later birth order was also correlated with superior writing skills, perhaps because these children are being helped by their older brothers or sisters. Parental schooling – both paternal and maternal – was also found to be an important determinant of children's writing abilities. There was no evidence, however, of a trade-off between quantity and quality – that is, the number of children per family was statistically insignificant. Nevertheless, the estimated effects of the number of boys and girls born within the household are negative and statistically significant. In terms of household economics, the single most important was again the

WEALTHINDEX variable. However, changes in household living standards, although negative, were statistically insignificant.

At the community level, proximity to school was positively correlated with better writing skills. Higher average costs of schooling also improved performance but we believe this is likely to be capturing the broader economic well-being of the community which may be correlated with greater parental investment in their children's educational development.

In specification 2, we included a variable for children's involvement in private tuition classes. As expected, this variable was positive and statistically significant, indicating the beneficial effects of attending extra classes on children's writing skills. In specification 3, we include two indicators for children's extra-household work and chores status. As with the numeracy skills results, the work–chore variable was statistically significant, suggesting that able children are able to cope with work and school at this age.

The estimated results for reading skills are presented in Table 6.6. Boys and girls performed equally well but Kinh children outperformed their ethnic minority counterparts. Maternal education was found to be important in positively influencing children's reading skills. The wealth index was again significant, but the variable indicating perceived changes in household wealth were not.²⁸ Negative events counter-intuitively emerged as positive and significant and we are unable to offer an explanation for this, but economic shocks leading to loss of income has the expected negative sign and was statistically significant. This result suggests that economic shocks may have a negative spillover impact on children's education.

Turning to specification 2, once again, private tuition improved children's reading skills. But in specification 3, no statistically significant correlation with child work was found, suggesting that at this age there is no negative impact on their basic reading abilities.

6.5 Summary

In general the estimated results are consistent with the empirical literature on educational attainment, which argues that individual and family background variables constitute important determinants of a child's educational attainment. Importantly, the variable LIVEDOWN was found to have a negative impact on children's educational attainment. Thus, if trade liberalisation results in a negative downturn for some households, Young Lives findings suggest that this will have a negative impact on children's human capital accumulation. Surprisingly, however, variables related to children's involvement in extra-household and domestic work activities were either not statistically significant for eight-year-old children or, in the case of numeracy and writing, positive.²⁹

7. Children's health status

7.1 Introduction

Trade liberalisation and market openness are expected to bring about improved life quality through increased income, greater employment opportunities, better choice of goods and services, including healthcare, through greater market opportunities and competition. But trade liberalisation may also have painful consequences for some groups of the population. On the one hand, greater openness to the international economy may lead to an increase in public demand for government safety nets, and children's health status may benefit from this if these government safety nets are targeted at health (Rodrik, 1999). Higher economic growth might also increase the government's tax revenue, which could facilitate an increase in spending on children's health. On the other hand, however, trade liberalisation might affect children's health by influencing the degree to which governments are willing and able to fund public health. Before *Doi Moi*, district hospitals and commune-level health centres provided medical services and essential drugs free of charge. However, as a consequence of liberalisation of the health sector (with the emergence of private hospitals and clinics) and a decrease in government budget support, the public health system deteriorated because of the exodus of thousands of doctors and health workers. By 1991, commune-level health centres were not working (Hong, 2000). According to the World Bank, 'the shortage of funds to the health centre is so acute; it is unclear where the grassroots facilities are going to find the inputs to continue functioning in the future' (cited in Hong, 2000).³⁰ However, the situation has improved thanks to the sustained GDP growth rate at over seven per cent and the new State Budget Law which was passed in 2004. According to Tran (2005), the government has given priority to improving the rural healthcare system. Official statistics show that Vietnam spends around five to six per cent of GDP on health expenditure. The share of government health spending at the local level (provincial and below) has also increased (Adam, 2005).

7.2 Model specification and data

Various measures of children's health status have been used in the literature including children's survival rate (Wagstaff and Nguyen, 2002) or anthropometry (height for age and weight for age). The Young Lives survey has a measure of acute illness (ie, incidence of illness in the last two weeks). To model the health of a child, which is unobserved, we adopt a latent variable framework,³¹ which can be considered as consistent with the literature on health production function. A child's health can be seen as a stock of human capital, which at any point in time can be determined by initial genetic endowment and subsequent investment. A change in a child's health status is determined through a production function which converts inputs into health.

We also include children's work status variables and assess their interaction effect as in the previous section on education. Descriptive statistics of these variables are provided in Table 7.1 in Appendix E.

(a) Child characteristics

In Vietnam there is some preference towards boys, thus we expect boys to be more likely to receive more attention and investment from parents, resulting in better health status. Differences between ethnic groups are left for the empirical exercise, although we expect Kinh children to be more likely to have better health status because of having greater

access to resources and public health facilities. With respect to birth order, being a first-born child would mean having better chances of accessing full parental attention and household resources without sharing with others.

(b) Household-level variables

Literature on the determinants of health suggests that there is a strong correlation between income and health (eg, Deaton 2006). In our analysis, we expect family income to have a strong influence on children's health. Better-off families (proxied by the Young Lives wealth index) would have more resources to invest in their children, in terms of food, nutrition intake and better access to health facilities. As in previous chapters, we also include a number of covariates in the model to capture a household's economic status, including whether the family owns the house they are living in, owns land, is in debt, and the number of rooms in the house. We expect these variables to be positively related to a child's health status.

Parental education is also included in the model, as we hypothesise that better-educated parents may be able to transform a given bundle of resources into higher levels of health for their children.

In our empirical analysis we control for the number of siblings as well as the number of boys and girls per family. For family structure, we include an indicator for female-headed households. Due to the feminisation of poverty, we hypothesise that children's health status in female-headed families would be worse than children in male-headed households. Lastly, we also assume that the effects of trade liberalisation on child health will be mediated by changes in household-level variables and we include variables reflecting changes in household economic status.

(c) Community characteristics

A number of community and macro-level variables are used in our model. They include the proportion of poor families per commune, the number of pharmacies within the neighbourhood and distance to health facilities. As discussed above, market reforms have led to a depletion of public health facilities, particularly at the commune level. This may have serious consequences for local inhabitants and children. In order to capture the effects of access to health facilities we create a series of dummy variables: access to public hospitals (HELDIS1), access to private hospitals (HELDIS2), access to local community health centres (HELDIS3), access to government dispensary (HELDIS5), access to private dispensary (HELDIS6), and distance to drug stores (HELDIS8).

Child labour causes widespread concern because of the potential damaging effects on health. However, there is a paucity of empirical literature on the effects of child labour on health (O'Donnell *et al.*, 2003). As Edmonds (2005a) and O'Donnell *et al.* (2003) argue, the majority of child labour takes the form of farm work or domestic chores, rather than involvement in hazardous work. However, the effect of child labour on health is not unambiguous. On the one hand, involvement in any type of labour implies some toll on young bodies, eg, contact with harmful fertilisers and pesticides in agricultural labour, which may have a negative impact on health. On the other hand, child work may ensure

physical fitness and mitigate against a sedentary lifestyle. To explore the potential impact of child labour on health, we include two variables, WORKCHORES and CHORESONLY, in the model.

7.3 Discussion of estimation results

Table 7.2 in Appendix E presents the estimation results for these three specifications. Specification 1 serves as the base model, which does not include indicators for access to health facilities and children's involvement in labour and domestic chores. The results from these three models are quite similar. Kinh children are found to be more likely to be ill.³² Birth order and the number of siblings are found to be statistically insignificant, ie, having no influence on the probability of children falling ill. At the family level, parental education – especially maternal education – is found to be important for a child's health, suggesting that the caring practices of better-educated parents may be superior.

The economic status of the household was proxied by the number of rooms in the household, whether the family was in debt or had been exposed to a negative event. However, only the number of rooms was found to be a statistically significant determinant of a child's health. The two variables capturing changes in household living standards over time were not statistically significant and nor was the wealth index.

The estimation results indicate that a child's involvement in labour and domestic chores does not increase the probability of falling ill. Our finding is consistent with that of O'Donnell *et al.* (2003) who found little evidence of a contemporaneous impact of child work on health.

In the model we include a number of variables indicating the accessibility to a range to health facilities as discussed above. As shown in Table 7.2, distance to a public health centre emerged as statistically significant, suggesting that access to public healthcare plays an important role in children's health. This is also consistent with findings by Wagstaff and Nguyen (2002) on the importance of health service coverage on a child's survival. The implication of this finding is that if trade liberalisation leads to decreased coverage of commune health centres, owing to declining tariff revenues and increased reliance on private health services, then poor children's health is likely to be negatively affected.

7.4 Summary

The results indicate the importance of family background on child health – especially household assets and parental education levels – and of proximity to community public health services. Children's involvement in work activities, although negative, did not emerge as having a significantly detrimental effect on their health.

8. Conclusions and policy challenges

Although Vietnam's extensive economic reforms – including trade liberalisation – over the last two decades have resulted in a significant reduction in national poverty rates, understanding of the differentiated social impacts of these reforms is still in a fledgling state. This paper has sought to contribute to an important dimension of this debate by tracing the potential effects of trade liberalisation on childhood poverty. In addition to individual child characteristics and several community-level infrastructure variables, we have paid particular attention to how household level variables – including family composition, parental education and occupations, gender relations, household wealth and vulnerability to shocks – mediate the relationship between shifts in trade policies and children's well-being.

While we acknowledge the complexities of tracing the impacts of macro-economic policy shifts down to the micro-household and intra-household levels, and the limitations of our sample, given that it is not nationally representative,³³ we nevertheless believe that this exercise serves to highlight some important policy challenges. In light of Vietnam's recent accession to the WTO in November 2006, we would argue that it is critical for policy-makers and advocates for vulnerable groups – including children and youth – to initiate a dialogue and to consider potential risks to diverse social groups. A growing body of international empirical evidence suggests that it will be particularly important to consider the introduction of complementary social policies in order to mitigate the potentially adverse impacts of trade liberalisation and to effectively harness the positive benefits for as many citizens as possible (eg, Moser, 2003; Veras *et al.*, 2006).

Overall our analysis suggests that children from ethnic minority group households, female-headed households, households with low levels of maternal education, impoverished households that are susceptible to economic shocks, as well as communes with a high concentration of poverty are likely to be the most vulnerable to future economic reforms and will be most in need of social protection measures. More specific findings can be summarised as follows:

Ethnic and gender differences

Significant gender differences among children emerged only in terms of girls' greater work burden, but it will be important to follow up, to see whether this has a cumulative impact on their human capital development over time. Ethnicity emerged as an important variable, except in the case of access to private tuition (where wealth was the main defining variable). There were significant differences in terms of educational achievement, with Kinh children performing better in terms of reading and writing than their ethnic minority counterparts. This suggests that concerted attention is needed to address the educational needs of children from minority ethnic groups especially as differences are emerging even after just one or two years in school (among the sample eight-year-old cohort). However, in terms of involvement in child work (domestic chores) and health status, Kinh (ethnic majority) children fared worse, suggesting that further research is needed to understand these surprising findings.

Involvement in work activities

Involvement in work (both chores and extra-household activities) was negatively correlated with children's access to private tuition, which suggests that children are unlikely to benefit from the positive impact of extra classes on children's reading and writing (but not numeracy) skills. It was insignificant, however, in terms of children's health status. This suggests that we need to investigate further how trade liberalisation is likely to affect children's involvement in the labour market as well as that of their caregivers, which can have a spillover impact on children's domestic and care work burden.

Household poverty and vulnerability

The household wealth index emerged as a highly significant variable in terms of children's access to private tuition and educational achievement. Clearly, then, improving household incomes is important for investments in children's educational human capital. However, household wealth was not linked to children's involvement in work activities (indicating a possible threshold effect), nor to their health status. Interestingly, specific economic shocks did not have a negative impact on children's well-being, suggesting that further research is needed to better understand the ways in which households seemingly protect their children from the worst effects of negative events. However, an overall decline in living standards was positively correlated with an increase in children's involvement in work activities as well as weaker numeracy skills. This suggests that we need to better understand the cumulative impact of negative events on household livelihoods as well as the importance of relative rather than absolute economic downturns in order to be able to design more effective social protection and social insurance mechanisms.

Family composition

The family composition variables were mixed, with no clear patterns emerging, except for a greater work burden among children in female-headed households and the advantage of being a younger sibling in terms of educational achievement. Parental education had a positive impact on children's scholastic achievement and health status, (and maternal education in particular on reading and health), suggesting a link between education, parental support and caring practices. This finding also further reinforces the importance of investing in education, given the possible intergenerational impacts on child well-being.

Access to public services

Access to public services did not affect children's involvement in work activities, but the variable emerged as important in terms of children's educational achievement and health status. This suggests that if trade liberalisation results in decreased government revenue, and pro-poor spending is not adequately safeguarded, then child well-being could be negatively affected. Accordingly, it will be crucial to closely monitor government investment in children's education and health programmes post-WTO accession and to ensure that expenditure trends match improved growth levels. Given that it is expected that rapid privatisation post-WTO accession will provide more opportunities for urban and better-off children to get access to good-quality education and health services, it will

be particularly important to invest in improving public services in poor and rural areas, which are less likely to benefit from such changes and are already starting from a lower baseline (eg, Witter, 1996).

Future data collection and research agenda

Lastly, but perhaps most significantly, our analysis highlights the need for more comprehensive data collection on the multi-dimensionality of childhood poverty at different stages of childhood (early infancy, pre-primary school, primary school, adolescence) and on intra-household dynamics – especially the impacts of caregivers’ shifting positioning within the labour market – as well as more rigorous analyses of this data. This will enable the development of social policies that effectively address the often multiple and overlapping vulnerabilities of children. It will be critical for the government and donors to invest in such research in order to carry out robust monitoring and evaluation of the social impacts of trade reforms over time so as to better ensure that Vietnam’s positive record of poverty alleviation to date is sustained and that socio-economic inequalities are minimised.

Appendix A

Table 3.1: Summary of Vietnam's trade reform	
Date	Trade policy changes
1986	<ul style="list-style-type: none"> The beginning of the economic reforms, moving from a centrally planning system to a socialist-oriented market-based system.
1987	<ul style="list-style-type: none"> A new law on foreign investment introduced a remarkably liberal regime for foreign direct investment (FDI) in Vietnam.
1988	<ul style="list-style-type: none"> The Law on Export and Import Duties on Commercial Goods introducing import duties, with rates initially ranging from 5 to 50 per cent became operational. Central government's monopoly of foreign trade was relaxed, allowing licensed foreign trading corporations and some other firms to engage in foreign trade.
1990	<ul style="list-style-type: none"> A major domestic tax reform was introduced: a special sales tax, a turnover tax and a profit tax. Export-import companies required to register Export of certain commodities limited to relevant exporter associations
1991	<ul style="list-style-type: none"> A regulation on setting up export processing zones (EPZs) was promulgated. Private companies were allowed to directly engage in foreign trade. An import duty rebate scheme for export producers was introduced.
1992	<ul style="list-style-type: none"> A trade agreement signed with the EU granted Vietnam most-favoured nation (MFN) treatment in EU markets, established quotas for exports of textiles and clothing to EU and granted tariff preferences on selected imports to Vietnam from the EU. The harmonised system (HS) of tariff nomenclature was introduced.
1993	<ul style="list-style-type: none"> Export shipment licensing was relaxed, with six-month licences (in place of shipment-by-shipment licences) introduced for 22 export commodities. Custom declaration form improved Duty rebate system improved
1994	<ul style="list-style-type: none"> Import permits were abolished for all but 15 products. Export shipment licensing was abolished for all products except rice, timber and petroleum. GATT observer status granted
1995	<ul style="list-style-type: none"> Export quotas were eliminated on all products except rice. Shipment-by-shipment licensing requirement was lifted from a wide range of consumer and producer goods. The number of products subject to import quotas was reduced to seven. Vietnam became a member of ASEAN and acceded to protocols of membership of the ASEAN Free Trade Area (AFTA). Vietnam applied for WTO membership. Export tariff raised for 11 products
1996	<ul style="list-style-type: none"> A new law on foreign investment reduced the coverage of import duty

	<p>exemptions for foreign investment projects.</p> <ul style="list-style-type: none"> • The tax on inward foreign exchange remittances was abolished. • The number of goods under import quotas was reduced to six. • The list of goods under the common effective preferential tariff (CEPT) of AFTA was promulgated.
1997	<ul style="list-style-type: none"> • The number of goods subject to import quotas was increased for balance-of-payments reasons. • Imports of sugar were restricted by licence. • Temporary prohibitions were imposed on a wide range of consumer goods and then lifted. • Rice quota allocated to provincial government • WTO accession process started
1998	<ul style="list-style-type: none"> • A new tariff structure with three different rates: MFN tariff, non-MFN tariff and preferential tariff • Licensed exporters were allowed to export any non-regulated product. • Producers of all non-regulated export products were allowed to export directly, without going through trading companies. • Restrictions imposed on imports of alcohol • A partial (80 per cent) foreign exchange surrender requirement was imposed on enterprises holding foreign exchange accounts. • Export duties eliminated on all goods except those on crude oil and scrap metal. • An informal road map for CEPT tariff reductions to 2006 was announced. • Vietnam was granted (by the US government) a waiver of the Jackson–Vanik amendments, enabling Vietnam to access US government-supported export credits and investment guarantees.
1999	<ul style="list-style-type: none"> • A value-added tax (VAT) was introduced in January 1999, along with a special sales tax. • The number of commodities under quantitative restrictions was increased (from 9 to 17) as a temporary measure to avert balance-of-payments pressure in the wake of the East Asian crisis. • The suspension periods for duty payments on imported inputs under the duty rebate scheme was extended to 275 days. Foreign exchange surrender requirement was reduced from 80 per cent to 50 per cent.
2000	<ul style="list-style-type: none"> • The bilateral trade agreement with the USA was signed in July, paving the way for MFN accession of Vietnamese exports to the US market and the gradual opening-up of the Vietnamese economy to imports of US goods and services and US foreign direct investment.
2001	<ul style="list-style-type: none"> • The US bilateral trade agreement came into effect on 10 December. • A five-year import–export regime that significantly advanced the removal of quantitative restrictions (QRs) was announced. • A total of 713 items transferred from the Temporary Exclusion List (TEL) to the Inclusion List, leaving 1,200 items still in the TEL • The foreign exchange surrender requirement for exporters was reduced from 50 per cent to 40 per cent.

	<ul style="list-style-type: none"> • A new customs law was announced in October with the aim of improving customs operation and customs clearance. • All legal entities (individuals and companies) were permitted to export most goods without licence (under the Decree 44/2001/ND-CP, August 2001).
2002	<ul style="list-style-type: none"> • Foreign Invested Enterprises (FIEs) -were granted the right to export commodities other than those they themselves produce. • Under the AFTA commitments, an additional 498 items were transferred from the TEL to the Inclusion List. • Quotas on motorcycles and certain parts thereof, and passenger vehicles with up to nine seats were abolished (December).
2003	<ul style="list-style-type: none"> • The last tranche of tariff lines in the TEL under CEPT was transferred to the Inclusion List. • A list of seven agricultural commodities subject to tariff rate quotas • Tariff schedule under the ASEAN CEPT programme issued for the period 2003 to 2006 • WTO working parties held (May and December) • MFN tariff schedule based on 8-digit ASEAN Harmonised Tariff Nomenclature issued
2004	<ul style="list-style-type: none"> • Concluded WTO negotiation with EU
2005	<ul style="list-style-type: none"> • Concluded WTO accession negotiation with almost all interested parties except USA, Australia and New Zealand • Failed to meet the target of joining the WTO by the end of 2005 • New Common Investment Law adopted • New Unified Enterprise Law adopted
2006	<ul style="list-style-type: none"> • Decree No. 88/2006/ND-CP on business registration. All individuals are required to register to import and export. • Concluding all negotiations with all WTO partners • Became a full member of the WTO on 7 November 2006

Source: Athukorala, 2005; CIE, 1998; Nguyen, 2004.

Appendix B. Construction of the Young Lives wealth index

The wealth index is constructed as follows:

Components of index and score	Contributing variables
H = Housing quality (/4)	Rooms/person, wall, roof, floor durability.
CD = Consumer Durables (/10)	Radio, fridge, bicycle, TV, motorbike/scooter, car, pump, mobile phone, landline phone, sewing machine
S = Services (/4)	Electricity, water, sanitation, cooking fuel.
Wealth Index = $(H+CD+S)/3$	Range = 0.0 – 1.0

Appendix C

The Household Utility Model

Suppose that a household can choose among J mutually exclusive alternatives for their children, indexed $j=0, \dots, J$. The household would obtain some ‘utility’ from each alternative if the household were to choose it. Denote the utility from choosing alternative j in the choice set as U_{ij} for household i . Utility depends on various factors, including the characteristics of the alternatives and the characteristics of the household and the individual children. We can write the utility function as $U_{ij} = U(\cdot)$. The individual household i is assumed to have a utility function of the form

$$U_{ij} = V_{ij} + \varepsilon_{ij} = \mathbf{x}_i' \boldsymbol{\beta}_j + \varepsilon_{ij}$$

where U_{ij} is the utility individual household i derives from choosing alternative j which comprises two components, V_{ij} and ε_{ij} . V_{ij} is a deterministic component, which is often assumed to depend linearly on vector \mathbf{x}_i . ε_{ij} is a random component, which represents unobservable factors.

The basic principle here is the notion that rational mother or father will choose the alternative that maximises the aggregated utility of the household gained from that choice. That is, alternative k in the choice set would be chosen if and only if $U_{ik} > U_{ij}$ for $k \neq j$. The alternative that yields the highest utility is chosen. When there are J choices, the probability that an alternative k is chosen is

$$\begin{aligned} \Pr(y = k) &= \Pr(U_k > U_j \text{ for all } j \neq k) \\ &= \Pr(\varepsilon_{ik} - \varepsilon_{ij} < V_{ij} - V_{ik}) \end{aligned}$$

where $\Pr(y_i = k)$ is now referred to as selection probabilities. McFadden (1973) shows that the multinomial logit model results if we assume all the ε_{ij} of the J choices are independent and identically distributed with the extreme value distribution of the form $F(\varepsilon) = \exp[-\exp(-\varepsilon)]$. The probability of alternative k being chosen can then be written

$$\text{as } \Pr(y_i = k) = \frac{\exp(\mathbf{x}_i' \boldsymbol{\beta}_k)}{\sum_{j=0}^J \exp(\mathbf{x}_i' \boldsymbol{\beta}_j)} . \text{ As it stands in equation the parameters are not identified}$$

since more than one set of parameters generate the same probabilities of the observed outcomes. This stems from the fundamental property of the logit model. In the multinomial logit model, only the difference between the utility, represented by $V_{ij} - V_{ik}$, affects the choice probability, not their absolute values, V_{ij} or V_{ik} , (Train 1993). Owing to this indeterminacy in the model we have to normalise the coefficients. The usual

normalisation is to assume that $\beta_0 = \mathbf{0}$ (Train, 1993, 2002; [2002 not in] Long, 1997; Greene, 1997). After normalisation we obtain the following probabilities:

$$\Pr(y = 0) = \frac{1}{1 + \sum_{j=1}^J \exp(\mathbf{x}_i' \beta_j)} \quad (1)$$

$$\Pr(y_i = k) = \frac{\exp(\mathbf{x}_i' \beta_k)}{1 + \sum_{j=1}^J \exp(\mathbf{x}_i' \beta_j)} \quad \text{for } j=1, 2, \dots, J. \quad (2)$$

As usual the likelihood of the multinomial logit is given by $L(\beta_1, \dots, \beta_J | \mathbf{x}) = \prod_{i=1}^n P_i$, with P_i is the probability of observing the i th observation. With the probabilities given in (1) and (2) we can write the likelihood equation for the multinomial logit model as

$$L(\beta_1, \dots, \beta_J | \mathbf{x}) = \prod_{k=1}^J \prod_{y_i=k} \frac{\exp(\mathbf{x}_i' \beta_k)}{\sum_{j=1}^J \exp(\mathbf{x}_i' \beta_j)}$$

where the product symbol, $\prod_{y_i=k}$, is over all cases for which $y_i = k$.

Table 5.2: Descriptive statistics for variable used in multinomial logit regression

Variable	Number of observations	Mean	Std. Dev.	Min	Max
Male	988	0.499	0.500	0	1
kidethnic	988	0.864	0.343	0	1
Order	988	1.309	1.554	0	15
femalehead	988	0.117	0.322	0	1
mumedu	970	2.279	1.210	1	9
Dadedu	946	2.664	1.487	1	9
Numsib	988	1.727	1.357	0	9
boyborn	988	1.411	1.094	0	8
Grlborn	988	1.463	1.219	0	9
wealthindex	988	0.437	0.208	0	1
Debt	988	0.639	0.481	0	1
negativeevent	988	0.602	0.490	0	1
ownhouse	988	1.144	0.351	1	2
numroom	988	1.848	0.997	1	12
ownland	988	1.259	0.438	1	2
Liveup	988	0.414	0.493	0	1
livedown	988	0.223	0.416	0	1
livesame	988	0.363	0.481	0	1
Hhjob	988	0.088	0.284	0	1
schdis3	988	0.857	0.350	0	1
poorfam	988	10.168	7.335	1	32
primacost	988	132.539	148.608	0	750
Phuyen	988	0.201	0.401	0	1
Bentre	988	0.198	0.399	0	1
Laocai	988	0.200	0.401	0	1
hungyen	988	0.200	0.401	0	1
Danang	988	0.199	0.400	0	1
Factory	988	0.111	0.315	0	1

Table 5.3: Marginal effects multinomial logit model for child work–chore combination

	Alternative = 1 (Neither work nor chores)			Alternative = 2 (Chores only)			Alternative = 3 (Work and chores)		
	Coeff	Standard Error	P-value	Coeff	Standard Error	P-value	Coeff	Standard Error	P-value
male	0.115	0.023	0.000	-0.126	0.035	0.000	0.011	0.029	0.720
kidethnic	-0.093	0.043	0.030	0.157	0.061	0.010	-0.064	0.049	0.195
order	0.034	0.015	0.028	-0.045	0.022	0.041	0.012	0.018	0.516
femalehead	0.002	0.032	0.957	-0.095	0.048	0.046	0.093	0.039	0.016
mumedu	0.012	0.010	0.229	-0.012	0.016	0.442	0.001	0.014	0.958
dadedu	-0.021	0.009	0.017	0.024	0.013	0.064	-0.003	0.011	0.770
numsib	0.005	0.021	0.828	-0.019	0.034	0.584	0.014	0.029	0.622
boyborn	-0.044	0.025	0.079	0.075	0.039	0.053	-0.031	0.032	0.341
grlborn	-0.018	0.025	0.477	0.038	0.038	0.322	-0.020	0.032	0.523
wealthindex	-0.022	0.080	0.785	0.140	0.127	0.272	-0.118	0.108	0.274
debt	-0.011	0.020	0.579	-0.011	0.032	0.740	0.022	0.028	0.434
negativeevent	-0.032	0.021	0.122	0.036	0.033	0.272	-0.004	0.028	0.888
ownhouse	-0.021	0.027	0.435	0.009	0.043	0.844	0.013	0.037	0.730
numroom	0.000	0.010	0.961	-0.006	0.016	0.711	0.005	0.014	0.689
ownland	0.018	0.025	0.478	-0.012	0.044	0.792	-0.006	0.039	0.877
liveup	-0.014	0.020	0.481	-0.028	0.034	0.413	0.042	0.030	0.157
livedown	-0.069	0.027	0.012	0.005	0.041	0.896	0.064	0.034	0.062
hhjob	0.031	0.032	0.320	-0.017	0.052	0.745	-0.015	0.044	0.740
schdis3	-0.005	0.034	0.881	0.089	0.046	0.055	-0.084	0.036	0.020
poorfam	-0.001	0.002	0.568	0.007	0.002	0.007	-0.006	0.002	0.005
primacost	0.000	0.000	0.475	0.000	0.000	0.394	0.000	0.000	0.286
phuyen	-0.043	0.039	0.275	-0.102	0.068	0.134	0.145	0.061	0.017
bentre	-0.021	0.042	0.614	-0.168	0.072	0.020	0.189	0.063	0.003
laocai	-0.204	0.052	0.000	0.079	0.083	0.342	0.125	0.072	0.084
hungyen	-0.086	0.040	0.032	-0.047	0.069	0.498	0.133	0.062	0.033
factoty	0.000	0.031	0.997	-0.038	0.053	0.479	0.038	0.047	0.419
Constant	0.068	0.100	0.499	0.000	0.163	0.999	-0.068	0.140	0.629

Number of obs	936
chi2(52)	152
Prob > chi2	0.000
Pseudo R2	0.096
Log Likelihood	-700.923

Appendix D

Table 6.3: Descriptive statistics of variables used

Variable	Number of obs.	Mean	Std. Dev.	Min	Max
extraclass	999	0.48	0.50	0	1
numeracy	999	0.66	0.47	0	1
write	992	2.67	0.62	1	3
levlread	993	3.76	0.72	1	4
male	999	0.50	0.50	0	1
kidethnic	999	0.86	0.34	0	1
order	999	1.31	1.56	0	15
femalehead	999	0.12	0.32	0	1
mumedu	981	2.27	1.21	1	9
dadedu	956	2.66	1.48	1	9
numsib	999	1.72	1.35	0	9
boyborn	999	1.41	1.09	0	8
grlborn	999	1.46	1.22	0	9
wealthindex	999	0.44	0.21	0	1
debt	999	0.64	0.48	0	1
negativeevent	999	0.60	0.49	0	1
ownhouse	999	1.14	0.35	1	2
numroom	999	1.84	0.99	1	12
ownland	999	1.26	0.44	1	2
liveup	999	0.41	0.49	0	1
livedown	999	0.22	0.42	0	1
livesame	999	0.36	0.48	0	1
hhjob	999	0.09	0.28	0	1
schdis3	999	0.86	0.35	0	1
poorfam	999	10.15	7.32	1	32
primacost	999	132.90	149.16	0	750
phuyen	999	0.20	0.40	0	1
bentre	999	0.20	0.40	0	1
laocai	999	0.20	0.40	0	1
hungyen	999	0.20	0.40	0	1
danang	999	0.20	0.40	0	1
workchore	999	0.17	0.38	0	1
choresonly	999	0.69	0.46	0	1

Table 6.3: Private tuition class attendance, marginal effect

	Specification 1			Specification 2		
	Coef.	Std. Err.	P>z	Coef.	Std. Err.	P>z
male	-0.017	0.048	0.729	-0.043	0.050	0.384
kidethnic	0.073	0.088	0.405	0.091	0.089	0.310
order	0.006	0.031	0.852	0.000	0.031	0.989
femalehead	0.082	0.068	0.226	0.075	0.069	0.277
mumedu	0.008	0.021	0.681	0.008	0.021	0.700
dadedu	0.009	0.016	0.587	0.012	0.016	0.449
numsib	-0.010	0.059	0.860	-0.008	0.060	0.891
boyborn	-0.065	0.063	0.303	-0.057	0.063	0.367
grlborn	-0.029	0.062	0.647	-0.030	0.062	0.636
wealthindex	0.592	0.174	0.001	0.608	0.176	0.001
debt	0.023	0.043	0.595	0.025	0.043	0.565
negativeevent	0.048	0.044	0.281	0.053	0.045	0.232
ownhouse	0.176	0.058	0.003	0.182	0.059	0.002
numroom	-0.038	0.023	0.091	-0.039	0.023	0.087
ownland	-0.089	0.056	0.110	-0.093	0.056	0.096
liveup	-0.014	0.045	0.763	-0.015	0.045	0.747
livedown	-0.003	0.054	0.952	0.002	0.055	0.967
hhjob	0.086	0.068	0.203	0.088	0.068	0.198
schdis3	0.090	0.064	0.161	0.095	0.065	0.143
poorfam	-0.014	0.004	0.000	-0.013	0.004	0.000
primacost	0.000	0.000	0.591	0.000	0.000	0.634
phuyen	-0.064	0.082	0.432	-0.066	0.083	0.424
bentre	-0.027	0.089	0.764	-0.034	0.089	0.704
laocai	0.002	0.099	0.980	0.023	0.100	0.820
hungyen	0.394	0.085	0.000	0.403	0.086	0.000
choresonly				-0.151	0.059	0.010
workchore				-0.087	0.071	0.222
Constant	-0.322	0.220	0.143	-0.246	0.224	0.273
Number of obs	946			946		
chi2(25)	198.71			202.29		
Log Likelihood	-505.01			-501.42		
Pseudo R2	0.2280			0.2335		

Table 6.4: Educational achievement – Numeracy skills (Marginal effects)

numeracy	Specification 1			Specification 2			Specification 3		
	Coef.	Std. Err.	P>z	Coef.	Std. Err.	P>z	Coef.	Std. Err.	P>z
male	0.010	0.039	0.790	0.011	0.039	0.775	0.023	0.040	0.563
kidethnic	0.103	0.065	0.114	0.104	0.065	0.113	0.105	0.066	0.110
order	0.015	0.024	0.536	0.015	0.024	0.539	0.018	0.024	0.471
femalehead	-0.051	0.056	0.368	-0.053	0.057	0.353	-0.059	0.057	0.303
mumedu	0.019	0.019	0.331	0.018	0.019	0.351	0.018	0.019	0.338
dadedu	0.025	0.015	0.095	0.024	0.015	0.103	0.023	0.015	0.126
numsib	-0.021	0.041	0.606	-0.020	0.041	0.626	-0.025	0.040	0.533
boyborn	-0.042	0.044	0.344	-0.041	0.044	0.352	-0.040	0.044	0.360
grlborn	-0.030	0.044	0.491	-0.030	0.044	0.488	-0.026	0.043	0.544
wealthindex	0.673	0.147	0.000	0.655	0.148	0.000	0.661	0.148	0.000
debt	0.027	0.036	0.454	0.026	0.036	0.477	0.023	0.036	0.522
negativeevent	0.035	0.037	0.333	0.034	0.037	0.351	0.032	0.037	0.387
ownhouse	0.024	0.049	0.631	0.018	0.050	0.709	0.013	0.050	0.798
numroom	-0.015	0.019	0.421	-0.014	0.019	0.467	-0.014	0.019	0.463
ownland	-0.117	0.050	0.019	-0.115	0.050	0.022	-0.108	0.050	0.032
liveup	0.015	0.038	0.681	0.016	0.038	0.678	0.011	0.038	0.763
livedown	0.082	0.046	0.078	0.082	0.046	0.076	0.071	0.047	0.128
hhjob	0.028	0.060	0.640	0.024	0.061	0.694	0.026	0.061	0.674
schdis3	0.058	0.049	0.235	0.056	0.049	0.250	0.059	0.049	0.226
poorfam	-0.001	0.003	0.653	-0.001	0.003	0.762	0.000	0.003	0.875
primacost	0.000	0.000	0.760	0.000	0.000	0.801	0.000	0.000	0.729
phuyen	-0.053	0.080	0.509	-0.048	0.080	0.548	-0.058	0.080	0.468
bentre	-0.105	0.083	0.206	-0.103	0.083	0.216	-0.111	0.084	0.185
laocai	-0.046	0.092	0.618	-0.043	0.092	0.640	-0.061	0.092	0.508
hungyen	-0.356	0.075	0.000	-0.369	0.076	0.000	-0.382	0.076	0.000
extraclass				0.044	0.038	0.257	0.047	0.039	0.226
workchore							0.140	0.060	0.019
choresonly							0.087	0.050	0.082
Constant	-0.047	0.183	0.797	-0.058	0.183	0.753	-0.145	0.188	0.439
Number of obs			946			946			946
chi2			130.840			131.810			134.290
Pseudo R2			0.133			0.134			0.138
Log Likelihood			-524.39			-523.75			-520.97

Table 6.5: Educational achievement – Writing skills (Marginal effects)

write	Specification 1			Specification 2			Specification 3		
	Coef.	Std. Err.	P>z	Coef.	Std. Err.	P>z	Coef.	Std. Err.	P>z
male	-0.244	0.205	0.233	-0.231	0.205	0.260	-0.173	0.208	0.405
kidethnic	0.608	0.324	0.061	0.625	0.325	0.054	0.641	0.325	0.049
order	0.270	0.119	0.023	0.267	0.120	0.025	0.285	0.121	0.018
femalehead	-0.203	0.299	0.496	-0.229	0.300	0.445	-0.246	0.301	0.414
mumedu	0.339	0.117	0.004	0.328	0.116	0.005	0.324	0.116	0.005
dadedu	0.232	0.091	0.011	0.222	0.090	0.013	0.214	0.090	0.017
numsib	0.264	0.207	0.202	0.280	0.208	0.179	0.248	0.207	0.231
boyborn	-0.866	0.227	0.000	-0.866	0.228	0.000	-0.860	0.227	0.000
grlborn	-0.673	0.221	0.002	-0.675	0.222	0.002	-0.654	0.221	0.003
wealthindex	2.525	0.775	0.001	2.371	0.780	0.002	2.399	0.780	0.002
debt	0.271	0.192	0.158	0.259	0.192	0.178	0.255	0.193	0.187
negativeevent	0.358	0.193	0.063	0.348	0.193	0.072	0.327	0.195	0.093
ownhouse	0.510	0.279	0.067	0.460	0.281	0.102	0.441	0.282	0.118
numroom	0.117	0.101	0.245	0.124	0.100	0.219	0.120	0.101	0.235
ownland	-0.177	0.263	0.500	-0.144	0.264	0.586	-0.128	0.264	0.629
liveup	0.098	0.203	0.629	0.096	0.203	0.638	0.071	0.204	0.727
livedown	-0.349	0.230	0.128	-0.351	0.230	0.128	-0.414	0.233	0.075
hhjob	-0.006	0.323	0.986	-0.038	0.324	0.906	-0.043	0.323	0.893
schdis3	-0.544	0.255	0.033	-0.562	0.256	0.028	-0.546	0.256	0.033
poorfam	0.000	0.013	0.981	0.003	0.013	0.800	0.004	0.013	0.741
primacost	0.004	0.002	0.031	0.004	0.002	0.047	0.004	0.002	0.042
phuyen	0.181	0.384	0.637	0.250	0.386	0.517	0.209	0.387	0.590
bentre	0.801	0.436	0.066	0.865	0.438	0.048	0.833	0.438	0.057
laocai	0.414	0.452	0.359	0.439	0.452	0.332	0.353	0.454	0.438
hungyen	-0.448	0.382	0.241	-0.569	0.385	0.140	-0.630	0.386	0.102
extraclass				0.473	0.206	0.021	0.482	0.207	0.020
workchore							0.578	0.308	0.060
choresonly							0.394	0.253	0.120
cut-off point 1	-0.596	0.969		-0.514	0.967		-0.183	0.984	
cut-off point 2	1.255	0.968		1.348	0.966		1.691	0.983	
Number of obs	939			939			939		
Chi2	292.40			297.73			301.34		
Pseudo R2	0.21			0.22			0.22		
Log likelihood	-534.44			-531.77			-529.97		

Table 6.6: Educational achievement – Reading skills (Marginal effects)

	Specification 1			Specification 2			Specification 3		
	Coef.	Std. Err.	P>z	Coef.	Std. Err.	P>z	Coef.	Std. Err.	P>z
levlread									
male	-0.138	0.283	0.626	-0.101	0.284	0.723	-0.044	0.287	0.879
kidethnic	1.231	0.429	0.004	1.294	0.432	0.003	1.317	0.433	0.002
order	0.245	0.150	0.102	0.229	0.151	0.129	0.240	0.152	0.115
femalehead	-0.122	0.436	0.780	-0.142	0.442	0.748	-0.152	0.441	0.730
mumedu	0.432	0.195	0.027	0.399	0.194	0.040	0.393	0.194	0.043
dadedu	0.154	0.136	0.257	0.129	0.132	0.328	0.122	0.133	0.360
numsib	0.234	0.241	0.331	0.260	0.245	0.289	0.240	0.244	0.324
boyborn	-0.877	0.272	0.001	-0.873	0.276	0.002	-0.867	0.274	0.002
grlborn	-0.612	0.264	0.020	-0.599	0.267	0.025	-0.580	0.267	0.030
wealthindex	4.359	1.088	0.000	4.174	1.093	0.000	4.127	1.096	0.000
debt	0.369	0.279	0.186	0.364	0.281	0.195	0.361	0.283	0.203
negativeevent	0.765	0.280	0.006	0.738	0.283	0.009	0.708	0.285	0.013
ownhouse	1.360	0.581	0.019	1.366	0.593	0.021	1.352	0.599	0.024
numroom	0.017	0.114	0.883	0.026	0.114	0.820	0.019	0.114	0.868
ownland	-0.499	0.388	0.199	-0.513	0.390	0.188	-0.500	0.392	0.203
liveup	0.113	0.293	0.700	0.084	0.297	0.776	0.041	0.300	0.890
livedown	-0.363	0.329	0.269	-0.411	0.331	0.214	-0.513	0.341	0.132
hhjob	-0.814	0.449	0.070	-0.894	0.450	0.047	-0.906	0.450	0.044
schdis3	-0.433	0.340	0.203	-0.477	0.343	0.164	-0.472	0.346	0.173
poorfam	0.032	0.017	0.067	0.038	0.017	0.028	0.040	0.017	0.023
primacost	0.002	0.002	0.415	0.001	0.002	0.660	0.001	0.002	0.583
phuyen	-0.364	0.568	0.522	-0.307	0.573	0.592	-0.315	0.573	0.583
bentre	0.886	0.662	0.181	0.958	0.667	0.151	0.965	0.669	0.149
laocai	-0.146	0.642	0.820	-0.164	0.648	0.800	-0.243	0.650	0.709
hungyen	-0.408	0.673	0.545	-0.698	0.684	0.308	-0.737	0.683	0.280
extraclass				0.902	0.335	0.007	0.906	0.337	0.007
workchore							0.561	0.429	0.190
choresonly							0.448	0.367	0.223
cut point 1	-0.250	1.444		-0.154	1.442		0.203	1.472	
cut point 2	0.843	1.443		0.945	1.440		1.306	1.471	
cut point 3	1.702	1.446		1.812	1.443		2.177	1.474	
Number of obs		940			940			940	
LR chi2(25)		308.17			315.92			317.75	
Pseudo R2		0.32			0.33			0.33	
Log likelihood		-326.66			-322.79			-321.87	

Appendix E

Table 7.1: Descriptive statistics of variables used in child health regression

Child not ill the last two weeks					Child ill the last two weeks			
Variable	Mean	Std. Dev.	Min	Max	Mean	Std. Dev.	Min	Max
male	0.505	0.500	0	1	0.495	0.501	0	1
order	1.306	1.596	0	15	1.309	1.471	0	8
numsib	1.744	1.407	0	9	1.682	1.240	0	7
kidethnic	0.856	0.351	0	1	0.881	0.325	0	1
femalehead	0.108	0.311	0	1	0.135	0.342	0	1
mumedu	2.367	1.273	1	9	2.084	1.047	1	6
dadedu	2.703	1.480	1	9	2.568	1.490	1	9
debt	0.597	0.491	0	1	0.719	0.450	0	1
wealthindex	0.447	0.210	0.008	0.933	0.415	0.203	0.007	0.883
negativeevent	0.554	0.497	0	1	0.697	0.460	0	1
hhjob	0.080	0.272	0	1	0.101	0.302	0	1
ownhouse	1.128	0.334	1	2	1.174	0.380	1	2
numroom	1.917	1.047	1	12	1.694	0.857	1	6
liveup	0.438	0.497	0	1	0.367	0.483	0	1
livedown	0.198	0.399	0	1	0.278	0.449	0	1
livesame	0.364	0.482	0	1	0.355	0.479	0	1
numphar	5.270	6.534	0	25	5.110	6.136	0	25
poorfam	9.643	7.181	1	32	11.171	7.502	1	32
danang	0.201	0.401	0	1	0.199	0.400	0	1
phuyen	0.198	0.399	0	1	0.205	0.404	0	1
bentre	0.187	0.390	0	1	0.226	0.419	0	1
laocai	0.202	0.402	0	1	0.196	0.397	0	1
hungyen	0.212	0.409	0	1	0.174	0.380	0	1
workchore	0.180	0.384	0	1	0.159	0.366	0	1
choresonly	0.679	0.467	0	1	0.706	0.456	0	1
heldis1	0.111	0.315	0	1	0.101	0.302	0	1
heldis2	0.055	0.228	0	1	0.040	0.196	0	1
heldis3	0.878	0.327	0	1	0.798	0.402	0	1
heldis5	0.178	0.383	0	1	0.187	0.390	0	1
heldis6	0.296	0.457	0	1	0.346	0.476	0	1
heldis8	0.722	0.448	0	1	0.749	0.434	0	1
No of observation	673				327			

Table 7.2: Determinants of child health status: Ill the last two week

	Specification 1			Specification 2			Specification 3		
	Coef.	Std. Err.	P>z	Coef.	Std. Err.	P>z	Coef.	Std. Err.	P>z
male	0.023	0.038	0.541	0.023	0.038	0.550	0.029	0.039	0.453
kidethnic	0.138	0.064	0.031	0.135	0.064	0.036	0.135	0.067	0.044
order	0.011	0.024	0.635	0.012	0.024	0.627	0.008	0.024	0.737
femalehead	0.076	0.052	0.142	0.082	0.052	0.117	0.085	0.053	0.104
mumedu	-0.050	0.018	0.005	-0.050	0.018	0.005	-0.049	0.018	0.006
dadedu	0.014	0.013	0.276	0.014	0.013	0.281	0.017	0.013	0.207
numsib	-0.059	0.037	0.113	-0.058	0.037	0.121	-0.063	0.038	0.098
boyborn	0.023	0.041	0.580	0.021	0.041	0.602	0.027	0.042	0.515
grlborn	0.053	0.041	0.196	0.052	0.041	0.207	0.062	0.041	0.138
wealthindex	0.045	0.141	0.751	0.038	0.141	0.785	0.067	0.144	0.643
debt	0.073	0.035	0.038	0.074	0.035	0.035	0.066	0.036	0.066
negativeevent	0.118	0.036	0.001	0.118	0.036	0.001	0.115	0.036	0.002
ownhouse	0.065	0.046	0.151	0.066	0.046	0.149	0.077	0.046	0.096
numroom	-0.049	0.020	0.016	-0.049	0.020	0.015	-0.053	0.021	0.010
ownland	-0.024	0.047	0.610	-0.024	0.047	0.601	-0.020	0.048	0.681
liveup	-0.017	0.037	0.644	-0.016	0.037	0.672	-0.023	0.037	0.534
livedown	0.038	0.043	0.374	0.041	0.043	0.337	0.029	0.043	0.499
hhjob	-0.013	0.055	0.816	-0.013	0.055	0.809	-0.008	0.055	0.884
poorfam	0.007	0.003	0.006	0.007	0.003	0.008	0.008	0.003	0.011
numphar	0.001	0.004	0.790	0.001	0.004	0.762	-0.011	0.007	0.133
phuyen	-0.127	0.076	0.095	-0.118	0.076	0.121	-0.130	0.095	0.172
bentre	-0.078	0.083	0.346	-0.069	0.083	0.403	-0.161	0.093	0.082
laocai	-0.015	0.080	0.847	-0.008	0.081	0.926	-0.068	0.108	0.526
hungyen	-0.077	0.077	0.322	-0.070	0.078	0.370	-0.070	0.092	0.449
workchore				-0.050	0.059	0.396	-0.044	0.059	0.460
choresonly				-0.002	0.048	0.969	-0.004	0.048	0.934
heldis1							0.006	0.107	0.951
heldis2							0.014	0.121	0.911
heldis3							-0.090	0.055	0.100
heldis5							0.125	0.093	0.179
heldis6							0.094	0.070	0.177
heldis8							0.018	0.046	0.697
Constant	-0.367	0.167	0.028	-0.356	0.170	0.036	-0.288	0.202	0.154
Number of obs		946			946			946	
chi2		64			65			73	
Prob > chi2		0.000			0.000			0.000	
Pseudo R2		0.058			0.059			0.067	
Log Likelihood		-561.653			-560.991			-556.092	

Note: Marginal effects reported

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² Over the last decade Vietnam has averaged a 7 per cent per annum growth rate. The poverty rate declined from 58 per cent in 1993 to 24.1 per cent in 2004 (*Achieving the Millennium Development Goals*, Report of Vietnam, 2005).

³ Senapaty (2003) argues that the relationship between gender and trade liberalisation is a two-way relationship: (i) trade liberalisation brings different costs and benefits to men and women, and this gender bias cuts across all economic and social categories; and (ii) the impact of trade liberalisation is mediated by gender relations and gendered social, economic and political structures. These structures may be in the form of gender gaps in education and health; patterns of labour market discrimination and labour force participation levels; gendered patterns of rights and resources; and other socio-cultural factors.

⁴ Ideally we should also pay attention to the potential impacts of trade liberalisation on women in light of their role as the primary caregivers in the large majority of Vietnamese households (Tuan *et al.*, 2003). We would hypothesise that changes in women's access to labour markets and their time allocation between productive and social reproductive activities are likely to have an important spillover impact on child well-being. However, data limitations preclude us from exploring this route in any depth.

⁵ The 2006 *World Development Report* found that 0–14 year olds comprised 30.3 per cent of the Vietnamese population. If we were also to include 15–17-year-olds in line with the UN Convention on the Rights of the Child 1989 (UNCRC) definition of children (people under 18 years of age), the figures would be higher still (World Bank, 2006).

⁶ See www.younglives.org.uk for further information.

⁷ Winters *et al.* (2002) argue that both trade liberalisation and poverty are not easily measured and trade liberalisation takes place in tandem with other macro-economic reforms.

⁸ Analyses of the gendered dimensions of trade have highlighted the following:

- a) although trade liberalisation often results in better earning opportunities for women – especially factory jobs in export-oriented sectors, as exemplified by the *maquilladora* sector in Mexico and women's entry into export-free-zones in East Asia – these jobs tend to be at the bottom of the international labour chain and are often highly exploitative;
- b) owing in part to women's domestic responsibilities (and pressures to enter and exit from the labour market more frequently) as well as lower investment in female education and human capital in many developing countries, women tend to have unequal access to labour markets, which puts them at a disadvantage in the context of liberalisation. This includes women's disproportionate positioning in the informal sector, further excluding them from the benefits of new labour market opportunities (eg, Sweetman, 2004).

⁹ Four groups of special goods were excepted from this reform: goods traded by quotas, prohibited goods, goods under government management and goods under line ministry's management.

¹⁰ However, not surprisingly, like many other countries Vietnam maintains import prohibitions on items such as arms and ammunition, explosive materials, military equipment, narcotics and toxic chemicals. The import prohibitions are based on health, national defence and social security concerns.

¹¹ In early 2006 the government lifted its import quota for sugar, leading to a sharp decrease (30 per cent) in the price of retail sugar on the market (<http://www.vnn.vn>).

¹² There are now 15 tariff rate bands (down from 20) and the simple average tariff rate increased from 16.8 per cent to 18.2 per cent.

¹³ See <http://www.ustr.gov.us> ; <http://www.heritage.org/research/features/index/country.cfm?id=Vietnam> ; <http://www.aseansec.org/7665.htm> for further information.

¹⁴ See <http://www.younglives.org.uk> for more details.

¹⁵ More comprehensive measures of child poverty, including indicators of children's psycho-social welfare, cognitive development and children's own perceptions of well-being, could not be included, because of data limitations.

¹⁶ Although designed as a longitudinal study, the Young Lives project has only had one round of data collection to date and thus is only able to provide a snapshot of the manifestations of childhood poverty at present.

¹⁷ By International Labour Organisation (ILO) standards of child labour, the eight-year-old children in the Young Lives Vietnam data are quite 'young'. Although we have data on older children's work activities, we have no data on their involvement in household chores, so we have not included them in the analysis. Interestingly, however, we found that there was not a significant difference in the hours worked in extra-household activities between older children and the eight-year-old cohort.

¹⁸ Originally we intended to analyse the work-school combination of these children. However, the data shows that a very small and insignificant proportion of children does not go to school (98.5 per cent go to school, 0.3 per cent do not go to school and 1.2 per cent do not answer this question). Therefore it is not worthwhile to explore the work-school combination. Rather we look at the work-chore combination.

¹⁹ If trade liberalisation leads to an increase in outputs and income, and the GDP variable at the province level affects child labour, then we may say that there is a link between trade liberalisation and child welfare. However, when we included this variable in the model, it always dropped out automatically by STATA (STATA8 SE). We therefore suspect that this variable is highly correlated with the dummy variables for provinces and resulted in a multicollinearity problem.

²⁰ Given that Young Lives specifically targets poorer households/districts, this may add to the threshold effects. Edmonds (2005b) reports that improved household income during 1992-98 explained up to 80 per cent of the decline in child labour during the same period.

²¹ The comparison category is living standards which have remained the same.

²² Hong (2000: 22) reports that 'The proportion of graduates from primary school who entered the four-year lower secondary education system declined from 92 per cent in 1986-7 to 72 per cent in 1989-90. A total of nearly three quarters of a million children were pushed out of the secondary school system during the first three years of the reforms.'

²³ In Vietnam school attendance is compulsory in primary school, as is reflected by the 98.9 per cent of children enrolled in our sample, despite Young Live's over-sampling of the poor.

²⁴ Most empirical studies to date have estimated the education production model either by using ordinary least squares (OLS) or ordinal logit/probit models, depending on the nature of data available, regressing a measure of educational attainment on a range of explanatory variables guided by Leibowitz's model. The value-added model suggested by Hanusheck (1979) is frequently estimated, in which a measure of educational attainment is regressed on previous attainment in addition to various explanatory variables.

²⁵ In Vietnam the most common form of private tuition is the extra classes run by schoolteachers for their students. As primary education is compulsory in Vietnam, we believe that attending extra classes may be an investment in human capital for students.

²⁶ Such a model is built around a latent variable model that assumes some underlying and unobserved latent propensity variable y^* where $y^* \in (-\infty, \infty)$. While we do not observe the latent variable y^* , we do observe a binary outcome y such that $y = 1$ if $y^* > 0$ and $y = 0$ otherwise. Defining the latent variable equation in linear form, we have

$$y^* = \mathbf{x}_i' \boldsymbol{\beta} + \varepsilon.$$

²⁷ However, as Tran *et al.* (2006) found, involvement in private tuition was linked to superior educational skills development only in terms of reading and not for mathematics or writing.

²⁸ This, however, could be due to the fact that there was insufficient variation in the data.

²⁹ Children's numeracy skills may have developed as a result of some work activities – eg, street vending, helping parents in petty trade etc.

³⁰ Trade liberalisation might also affect children's health by affecting environmental quality. For example, increased industrialisation may lead to increased air and water pollution which directly affect children's health. However, owing to data limitations we do not consider these dimensions in this paper.

³¹ We adopt a latent variable model whereby:

$$y^* = \mathbf{x}_i' \boldsymbol{\beta} + \varepsilon$$

where y^* is the unobserved health status of child i , \mathbf{x} is a vector of covariates which we believe to influence y^* . Instead of observing the latent variable, we observe in the data

$Y_i = 1$ if child i was ill during the last two weeks.

$Y_i = 0$ otherwise

As before, we estimate a binary logit model and report the marginal effects for ease of interpretation.

³² This result may seem counter-intuitive but it could be partly due to greater awareness of and willingness to report ill health among Kinh rather than families from minority ethnic groups

³³ The Young Lives 2002 survey adopted a purposive sentinel site methodological approach, which aimed to over-sample poor households and to ensure coverage of Vietnam's major geographical and agro-ecological zones.