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Children and the youth in rural Vietnam

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Abstract: Structural transformation in rural Vietnam has led to rising incomes and a diversification of livelihoods away from agriculture. Using panel data on children in 2,181 rural households surveyed over the 2008-14 period, we examine how the welfare of children has been impacted by structural transformation. Our analysis depicts a society that has made great progress towards improving child welfare which can in part be linked to the empowerment of women that has accompanied the transformation process. We find heterogeneity in welfare gains though, with boys benefitting more than girls and persistently lower levels of child welfare among ethnic minorities.

Keywords: child welfare, child labour, education, gender, structural transformation, Vietnam
JEL classification: O12, D1, J13

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1 Introduction

The ongoing process of structural transformation in rural Viet Nam has led to rising incomes and a diversification of economic activities away from agriculture. As incomes rise and rural households become better off, the welfare of children, like other household members, are likely to improve. Improvements in the level and security of household income are likely to translate to improvements in the health, educational attainment, and life opportunities of children and young people more generally. Moreover, as households shift out of agriculture towards waged employment, children are less likely to spend their time on agricultural work allowing more time for school and study. Where economic transformation empowers women, this is also likely to impact positively on the welfare of children.[1] It is also possible, however, that if the process of structural transformation has left some groups behind or there are inequalities in the distribution of the fruits of economic growth, children and the youth, as a particularly vulnerable group, are likely to be adversely affected.

In this paper we examine how the lives of the children and youth living in rural Viet Nam have been impacted by structural transformation. We use the Vietnam Access to Resources Household Survey (VARHS), a rich database on the economic activities and wellbeing of rural households and their children collected every two years between 2008 and 2014.[2] VARHS covers a representative sample of 2,181 rural households in 12 provinces of Viet Nam. The same households are surveyed in each round creating a rich panel database that allows the extent to which the on-going process of economic transformation in Viet Nam has impacted on the lives of children and the youth to be analysed.

First, we examine the characteristics of households with children compared to those without and how these have changed between 2008 and 2014. In the second part of our analysis we exploit the detailed individual level data contained in VARHS on a range of different welfare measures to compare different age cohorts over time to examine whether children in general are doing better in 2014 compared with 2008. We measure the welfare of children using information on their health, education attendance and attainment, as well as engagement in labour (agricultural, household enterprise, and waged employment). We also examine whether there is heterogeneity in welfare gains along gender and ethnic lines.

In the third part of our analysis, we create a panel dataset of households that contains individual level information on children that tracks each child present in each household in 2008 through each round of the survey up to 2014. This allows us to determine the dominating household characteristics in determining the welfare of children over the period. Finally, we examine whether there is evidence that female empowerment and an increase in the resources held in the hands of women is linked with improvements for children.

Early studies have analysed the relationship between economic development and child wellbeing in Viet Nam, in particular with respect to child labour. Using data from the Viet Nam Living

[1] A large literature exists, which highlights how resources in the hands of women are more likely to be used to improve children's outcomes, particularly girls, than resources held in the hands of men (Duflo 2003; Pitt and Khandker 1998; Qian 2008). Newman (2015) shows significant improvements in the empowerment of women in Viet Nam over the last decade evident through an expansion in access to resources and economic opportunities for women.

[2] Data are available from the Central Institute for Economic Management, Hanoi, Viet Nam (see http://www.ciem.org.vn/).

Standards Surveys for the period 1993–98, Edmonds (2005) shows a significant drop in child labour of about 30 per cent over a five-year period. Given the panel nature of the data used, the author is also able to disentangle the different determinants of the reduction in child labour. The author finds that improvements in household economic status explain a stark 60 per cent of the change in child labour over the period considered. In particular, the effect of improvements in economic status on reducing child labour is found to be greater in poorer households than in wealthier ones. These results support the findings of the cross-country literature that suggests a strong relationship between GDP per capita and child labour (Krueger 1997).

Edmonds and Turk (2004) further explore heterogeneity in the incidence and drop in child labour in Viet Nam using the Viet Nam Living Standards Surveys also for the period 1993–98. In particular, girls experience a smaller decline in child labour than boys. Children living in rural areas are also found to be more likely to work than children in urban areas, in particular in traditional occupations. Parents' business activities are linked to child labour, as child labour is more likely to increase with the opening and closing of household enterprises. Finally, children of ethnic minorities are found to be more likely to work than children of non-ethnic minorities. Overall, Edmonds and Turk provide evidence of a strong association between poverty and child labour and highlight the importance of anti-poverty programmes as a path to reducing child labour. Edmonds and Pavcnik (2005a) investigate the impact of the integration of Viet Nam's rice market on child labour and provide evidence that the increase in rice prices between 1992–93 and 1997–98 was linked to a decrease in child labour.

Beegle et al. (2009) use Viet Nam Living Standards Surveys to analyse the effects of child labour on education, wages, and health. They provide evidence that child labour has a negative effect on school participation and education attainment five years after the child's labour experience. Young adults involved in labour during their childhood are found to have higher wages. However, this effect is reversed over a longer time period, as the earnings' loss due to lower education attainment exceeds the initial wage gain due to child labour. While Beegle et al. (2009) find no impact of child labour on health, O'Donnell et al. (2005) find a negative impact of child labour on girls' health, five years after the child labour episode.

We contribute to the existing literature by providing evidence of the progress made in Viet Nam towards improved child wellbeing in recent years. Section 2 presents descriptive statistics on the characteristics of households with children in the VARHS sample. In Section 3 a cohort analysis is conducted to determine how the welfare of children of the same age in 2008 compares to that of children in 2014. The cohort analysis is also disaggregated along gender and ethnic lines. Panel data analysis linking household characteristics and female empowerment to children's welfare outcomes is presented in Section 4. Section 5 concludes.

2 The characteristics of households with children

In 2014, 54 per cent of households in the VARHS sample had children.[3] Of the households with children, the average number of children was 1.68 (0.81 girls and 0.87 boys). Fertility rates in general appear to have increased over the sample period. In 2008, 49 per cent of the VARHS sample had children, with these households having an average of 1.67 children (0.82 girls and 0.85 boys). It should be noted, however, that these statistics are based on the unbalanced panel of households which includes the addition of over 500 new younger households in 2012 to

[3] Any household member under the age of 18. We consider different age brackets throughout the analysis: 5–9 year olds, 10–15 year olds, and 15–18 year olds.

account for ageing of the original VARHS households sampled in 2006. The small increase in the proportion of households with children is likely accounted for by these households.

Table 1 explores the variation in fertility across seven different regions covered by VARHS, namely: Red River Delta (Ha Tay), North (Lao Cai, Phu Tho, Lai Chau, and Dien Bien), Central Coast (Nghe An, Quang Nam, and Khanh Hoa), Central Highlands (Dak Lak, Dak Nong, and Lam Dong), and Mekong River Delta (Long An).[4] The table presents the proportion of households in the VARHS sample in each region that have children and for those households the average number of children.

Table 1: Geographical variation in fertility [a]

	2008		2010		2012		2014	
	% HH with children	Mean no. of children	% HH with children	Mean no. of children	% HH with children	Mean no. of children	% HH with children	Mean no. of children
Red River Delta	0.44	1.62	0.46	1.63	0.54	1.66	0.52	1.72
North	0.52	1.71	0.57	1.72	0.59	1.77	0.57	1.73
Central Coast	0.47	1.58	0.50	1.62	0.52	1.65	0.50	1.64
Central Highlands	0.63	1.92	0.65	1.98	0.65	1.85	0.61	1.83
Mekong River Delta	0.44	1.38	0.50	1.45	0.49	1.43	0.50	1.41

Note: [a]unbalanced panel of households.

Source: Authors' calculations based on survey data from VARHS 2008-14.

The proportion of households with children is highest in the Central Highlands and in the North. While the proportion of households with children increased marginally in the other regions between 2008 and 2014, in part due to the addition of new younger households to the sample in 2012, the difference between the Central Highlands, the North, and the rest of the country is still quite large in 2014. Moreover, households with children in the Central Highlands and the North have more children on average than households with children in other regions. For example, in 2008, these households had on average 1.81 children compared with an average of 1.53 children for households with children in other regions. The gap closes a little between 2008 and 2014 at an average of 1.78 and 1.59, respectively, in 2014.

We explore the characteristics of households with children in Table 2. In each year we test for the statistical significance of the difference in the average value of each variable for households with children and households without.

The head of household in households with children is on average younger than in households with no children and is also more likely to be married. They are also less likely to be headed by a woman. In 2010, heads of households with children were significantly less likely to have higher education (i.e. post-secondary schooling) than in households with no children. With the addition of new younger households to the sample in 2012 this difference disappears. Ethnic minority households are significantly more likely to have children than Kinh households. This is not surprising given the geographic differences presented in Table 1, which shows the highest fertility in the northwest, where over 87 per cent of households in the sample are ethnic minorities.

[4] It should be noted that our data are not representative of the regions but the rural provinces within each region.

While the average (monthly) income of households with children is higher than in households without children in each year (but only significantly so in 2010 and 2014), this income measure is not adjusted for household size. When the larger size of households is taken into account, households without children have higher income per capita. This is reflected in the fact that households with children have lower food expenditure per capita in all years, though this is likely due to the fact that each household member is given the same weight in computing per capita food expenditure leading to an underestimation of its value for households with children; it is likely that children consume less than adults and that there are economies of scale in food expenditure.[5]

Table 2: Characteristics of households with children, 2008–14[a]

	2008		2010		2012		2014	
	HH with children	HH no children	HH with children	HH no children	HH with children	HH no children	HH with children	HH no children
Age[b]	37.45	43.49***	38.55	45.96***	37.35	46.65***	39.37	48.89***
Married[b]	0.85	0.77***	0.84	0.78***	0.85	0.75***	0.85	0.74***
Female[b]	0.18	0.26***	0.18	0.25***	0.17	0.26***	0.19	0.28***
Higher ed[b]	0.15	0.17	0.17	0.22***	0.22	0.21	0.25	0.24
Ethnic min[b]	0.28	0.14***	0.27	0.13***	0.26	0.14***	0.25	0.15***
Income (000 VND)	5,666	5,742	7,001	6,555***	7.910	7,147	8,700	7,342*
Food exp p.c. (000 VND)	260	359***	305	403***	396	522***	402	516***
Savings (000 VND)	21,327	21,057	31,536	31,505	36,539	43,164	38,045	39,147
Loans (000 VND)	15,114	17,476	20,613	15,767*	26,044	15,617**	24,841	14,218**
Durables (000 VND)	6,629	27,163	10,598	5,215	6,227	6,365	6,263	5,488**
Land area (ha)	8,590	7,016***	8,558	6,592***	7,110	6,733	7,084	6,351
Red Book	0.83	0.89***	0.77	0.86***	0.78	0.89***	0.84	0.92***
Ag income	0.90	0.86***	0.87	0.84**	0.84	0.79***	0.83	0.78***
Wage income	0.60	0.56*	0.63	0.54***	0.70	0.57***	0.75	0.59***
HHEnt income	0.28	0.26	0.30	0.26**	0.30	0.22***	0.29	0.21***
Agriculture only	0.26	0.25	0.20	0.26***	0.15	0.23***	0.13	0.23***
Diversified	0.74	0.70*	0.79	0.68***	0.84	0.68***	0.86	0.68***
Nat Shock	0.45	0.41**	0.47	0.37***	0.32	0.26***	0.24	0.22
Econ Shock	0.25	0.21**	0.16	0.17	0.18	0.19	0.12	0.15*
n	1,125	1,161	1,195	1,050	1,532	1,228	1,471	1,254

Notes: [a]unbalanced panel of households; [b]refers to household head. *** indicates difference significant at 1% level, ** at 5% level, and * at 10% level.

Source: Authors' calculations based on survey data from VARHS 2008-14.

In relation to assets, there is no statistically significant difference in the savings levels of households with children compared to those without in any year, and only in 2014 do households with children record having significantly more durable goods. They do, however, own more land than households without children, at least in 2008 and 2010, but are significantly less likely to hold a land use certificate or red book for that land. On the whole it does not appear that households with children are wealthier than households without. They do however

[5] Food expenditure items include pork, beef, chicken, fish, shrimp, fruit, candy/cookies, powdered or canned milk, liquid milk, beer, rice wine or other alcoholic drink, coffee, industrial beverages, processed foods, and eating and drinking outside the home

have more access to credit with a significantly higher level of loans than households without children.

In terms of sources of income, households with children are significantly more diversified and are more likely to earn income from all sources; agriculture, wage, and household enterprises. This may be due to the availability of labour resources that allow them to engage in many different activities or may be a means of managing risk. Indeed, households with children are more vulnerable to natural shocks which primarily affect agricultural production but are less likely to suffer from economic shocks associated with unemployment or illness, for example, suggesting that there are risk-coping mechanisms at work.

3 Cohort analysis

The VARHS collects detailed information on all individuals in each household including certain information on children. Using these data we can examine how children's welfare has evolved over the 2008–14 period. We consider three different age cohorts in our analysis: 5–9 year olds; 10–14 year olds; and 15–18 year olds.[6] We compare the welfare of children in each cohort in 2008 with their counterparts in 2014. To ensure our sample is as close as possible to being representative we use the unbalanced panel of data so that the data in 2014 capture the new younger households that were added in 2012.

We consider three broad categories of child welfare: health, education, and child labour. First, in relation to health, for each individual in the household, the survey respondent is asked whether that individual was ill in the previous two weeks. For those that were ill, they are then asked whether they were ill as a result of a range of illnesses, which we aggregate into chronic illness (including heart disease, respiratory illness, and cancer), mental illness, or other types of temporary illness including colds, flu, other injuries, etc. Second, in relation to education, we consider an indicator for whether children attend school and for those above four years of age, how many years of education they have attained. Third, in relation to child labour, VARHS records detailed time use data for all household members. The head of household records how many days in the last year each household member worked in different types of activities. They include agriculture, common property resources, working for the household enterprise, and working for a wage outside of the home.

Basu et al. (2010) and Edmonds and Pavcnik (2005b) highlight the importance of including domestic work as child labour. Unfortunately the VARHS data do not measure domestic work and household chores in a consistent way over time and we cannot include them in our analysis. We are aware that by excluding domestic work from our analysis, we may underestimate girls' involvement in labour.

Table 3 presents each of these welfare measures for the three cohorts of children in 2008 and 2014. The proportion of children in each cohort that are female is also presented.

[6] We do not report the characteristics of 0–4 year olds, as we do not find any significant change over time.

Table 3: Characteristics of different cohorts of children, 2008–14[a]

Cohort:	5–9 year olds		10–14 year olds		15–18 year olds	
Year	2008	2014	2008	2014	2008	2014
Female	0.51	0.53	0.50	0.51	0.54	0.50
Sick in last 2 weeks	0.10	0.07**	0.07	0.03***	0.07	0.03***
Of which:						
Chronic illness	0.15	0.29*	0.09	0.04	0.16	0.10
Mental illness	0.05	0.08	0.09	0.00	0.09	0.10
Other illness	0.83	0.67**	0.85	1.00**	0.75	0.81
Attends school	0.57	0.59	0.91	0.97***	0.64	0.75***
Years of education	2.07	2.17	5.77	5.91*	8.93	9.58***
Total days of work	5.17	1.44***	21.34	6.70***	64.64	34.40***
Days work ag	3.53	0.99***	17.23	5.16***	38.55	15.23***
Days work cpr	0.42	0.12**	1.63	0.53***	3.81	1.92***
Days work ent	0.00	0.00	1.04	0.49*	4.41	2.04**
Days work wage	1.21	0.32	1.46	0.53	18.14	15.21
n	680	778	1,028	836	1,071	738

Notes: [a]unbalanced panel of households. *** indicates difference significant at 1% level, ** at 5% level, and * at 10% level.

Source: Authors' calculations based on survey data from VARHS 2008-14.

Table 3 shows a decline in the proportion of children that experienced an illness in the previous two weeks. This is somewhat suggestive of an improvement in the health of children and young people over time. In the 5-9 year age group there has been a statistically significant increase in the diagnosis of chronic illnesses. This is suggestive of improved health care diagnostics for this age group. This is not observed in other cohorts.

Children over ten years of age are significantly more likely to attend school in 2014 compared with 2008, and have on average more years of schooling. There have also been some improvements for children in terms of time use. Children spend considerably fewer days working at all activities in 2014 compared with 2008 in all age groups. Of particular note is the decline in the number of days children spend doing agricultural activities from 3.5 to 1 day a year in the 5-9 year old age group, from 17.2 to 5.2 in the 10-14 year old age group, and from 38.5 to 15.2 in the 15-18 year old age group. Declines in waged work are also evident, particularly among the older age group, from 18.1 days a year in 2008 to 15.2 in 2014, but the difference is not statistically significant.

Overall, these statistics suggest that the welfare of children, in the areas of health, education, and child labour, has improved between 2008 and 2014. These results seem to support the findings of the literature presented in the introduction showing a positive trajectory of child wellbeing in Viet Nam over time.

Are these improvements homogenous across expenditure quintile? The nature of the VARHS data allows children of the same age cohort to be followed over time. We focus on 5–9 year olds at the time of the 2008 survey and we investigate their school attendance and educational attainment for the following three rounds of the survey. We divide the 5–9 year olds cohort by expenditure quintile, as measured in 2008. Table 4 reports the results. In 2008, only 50 per cent of the children in the bottom quintile attended school, versus 60 per cent of the children in the

top quintile. Children in the top quintile had already accumulated almost one more year of schooling compared to children in the bottom quintile. While school attendance increases for all groups over time, the difference between the top and bottom quintile remains quite large; only 58 per cent of the children in the bottom quintile attend school in 2014, while 75 per cent of the children in the top quintile are in school. Interestingly, the middle quintiles seem to catch up over time. In particular, the second poorest quintile shows a significant increase in the level of school attendance in 2014, with 69 per cent of children attending school compared with only 57 per cent in 2008. Table 4 highlights the fact that, while all groups improved their outcomes over time, the bottom quintile, i.e. the children belonging to the poorest segment of society in 2008, do not catch up with the other groups. A divergence in human capital accumulation between the poorest group and the rest may in fact prolong welfare differences over time making it more difficult for them to catch up in the long run.

Table 4: Evolution of education outcomes for children aged 5–9 in 2008, by food expenditure quintile in 2008

	2008		2010		2012		2014	
Quintile 2008	Attend school	Years of education	Attend school	Years of education	Attend school	Years of education	Attend school	Years of education
1	0.50	4.00	0.61	4.49	0.59	5.43	0.58	6.58
2	0.57	4.80	0.68	5.45	0.69	6.22	0.69	7.31
3	0.63	4.76	0.76	5.45	0.78	6.91	0.75	7.96
4	0.61	4.91	0.71	5.68	0.78	6.83	0.73	7.81
5	0.60	4.94	0.74	5.44	0.78	6.60	0.75	7.74

Source: Authors' calculations based on survey data from VARHS 2008-14.

In the next step of our analysis we disaggregate cohorts into girls and boys. In the light of the findings by Edmonds and Turk (2004) on the heterogeneity in child wellbeing, we try to determine whether there are any gender disparities in the distribution of welfare gains. We focus on the 5–18 year old age groups. The disaggregation is presented in Table 5 for the overall health indicator, the education measures and time use.

Table 5: Characteristics of different cohorts by gender of children, 2008–14[a]

	5–9 year olds				10–14 year olds				15–18 year olds			
	2008		2014		2008		2014		2008		2014	
	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls	Boys
Sick in last 2 weeks	0.10	0.09	0.09	0.05**	0.07	0.06	0.03	0.03	0.06	0.08	0.04	0.02
Attends school	0.54	0.59	0.62	0.56*	0.92	0.91	0.97	0.97	0.64	0.63	0.72	0.77
Years of education	2.04	2.09	2.05	2.31**	5.79	5.75	5.78	6.04**	9.01	8.85	9.48	9.68
Total days of work	5.99	4.32	1.25	1.65	18.63	24.00*	6.24	7.19	62.96	66.58	36.05	32.75**
Days work ag	5.05	1.96**	1.16	0.81	14.80	19.60*	5.13	5.19	39.77	37.14	17.38	13.10
Days work cpr	0.36	0.49	0.09	0.16	1.52	1.74	0.70	0.34**	4.42	3.11*	1.85	1.99
Days work ent	0.00	0.00	0.00	0.00	0.53	1.55**	0.15	0.85*	3.64	5.31	2.49	1.60
Days work wage	0.58	1.86	0.00	0.68	1.82	1.11	0.27	0.82	15.67	21.02	14.34	16.07

Notes: [a]unbalanced panel of households. *** indicates difference significant at 1% level, ** at 5% level, and * at 10% level.

Source: Authors' calculations based on survey data from VARHS 2008-14.

Table 6: Characteristics of different cohorts by ethnicity of household head, 2008-14[a]

	5–9 year olds				10–14 year olds				15–18 year olds			
	2008		2014		2008		2014		2008		2014	
	Ethnic Minority	Kinh	Ethnic Minority	Kinh	Ethnic Minority	Kinh	Ethnic Minority	Kinh	Ethnic Minority	Kinh	Ethnic Minority	Kinh
Sick in last 2 weeks	0.09	0.10	0.08	0.06	0.05	0.07	0.04	0.03	0.08	0.07	0.04	0.02
Attends school	0.57	0.57	0.61	0.59	0.81	0.96***	0.94	0.99***	0.45	0.72***	0.59	0.81***
Years of education	1.82	2.20***	2.18	2.16	5.05	6.09***	5.62	6.03***	7.46	9.53***	8.36	10.12***
Total days of work	7.72	3.85	1.66	1.36	30.60	17.14***	13.56	3.85***	82.47	57.44***	42.69	30.73**
Days work ag	6.54	1.98***	1.46	0.83	26.81	12.87***	11.61	2.46***	64.01	28.27***	30.05	8.69***
Days work cpr	0.97	0.14***	0.20	0.10	2.92	1.05***	1.18	0.25***	7.69	2.25***	4.33	0.85***
Days work ent	0.00	0.00	0.00	0.00	0.19	1.43**	0.62	0.43	1.07	5.76***	0.23	2.84*
Days work wage	0.22	1.72	0.00	0.43	0.68	1.81	0.14	0.70	9.85	21.50***	8.08	18.36**

Notes: [a]unbalanced panel of households. *** indicates difference significant at 1% level, ** at 5% level, and * at 10% level.

Source: Authors' calculations based on survey data from VARHS 2008-14.

The incidence of sickness declined for both boys and girls between 2008 and 2014. Boys are less likely than girls to have experienced an illness in the previous two weeks. This difference, however, is only statistically significant in the 5–9 year old age group. The school attendance rate and years of education completed increased or stayed the same between 2008 and 2014 for both boys and girls across every cohort. In 2014, girls aged 5–9 years are significantly more likely to attend school than boys. Boys, however, have more years of education than girls in this age cohort. Boys also have significantly more years of education than girls in the 10–14 year old age group in 2014. These findings suggest that while both girls and boys have experienced improvements in health and schooling outcomes, these gains have been particularly beneficial for boys.

The decline in the number of days children spend working is also evident across both girls and boys but with boys experiencing bigger gains in the older age groups. In 2014 boys aged 15–18 years spend significantly fewer days than girls of the same age working outside of the household. This trend is also reflected in the number of days worked in different types of activities. Girls in the 5–9 year old age group spend more days working in agriculture than boys in 2008 but both experienced a decline in the average number of days to around one per annum. Similarly in the 10–14 year age group girls experienced a decline in the number of days worked in agriculture from 14.8 to 5.13 between 2014 and 2008 compared with a decline from 19.6 to 5.2 for boys of the same age. In the 15–18 age group, the relative gains are even greater for boys with a decline in the average number of days worked in agriculture from 37.1 to 13.1 compared with a decline for girls of the same age from 39.8 to 17.4. Boys spend on average more days working for a wage than girls across all age groups but this difference is not statistically significant. Overall, these trends suggest that while the welfare of both girls and boys improved between 2008 and 2014, boys benefitted to a greater extent than girls. These findings are in line with the cross-country evidence, according to which the prevalence of child labour is greater for girls and for boys (Edmonds and Pavcnik 2005a).

Given the existing evidence of heterogeneity in child wellbeing with respect to ethnicity (Edmonds and Turk 2004), we also disaggregate the cohort analysis by ethnicity of the household head. Descriptive statistics are presented in Table 6. There is no evidence of differences in health outcomes for children in ethnic minority households. Educational outcomes of ethnic minority households are also similar to those of Kinh households in younger age groups. Gaps, however, begin to emerge in older age groups. The participation rate of children in ethnic minority households in education is significantly lower among 10–14 year olds and 15–18 year olds. In the case of the latter the difference is particularly stark with only 59 per cent of children from ethnic minority households attending school compared with 81 per cent for Kinh households. Similarly, the average years of schooling attained by children over the age of ten are significantly lower in ethnic minority households. In 2014, the average years of schooling attained by children in ethnic minority households in the 10–14 year old age group was 5.6 compared to six for children in Kinh households. In the 15–18 year old age group, children of ethnic minority households have an average of 8.4 years of schooling compared to 10.1 for children in Kinh households. While living standards have increased over time for both Kinh and non-Kinh groups, it appears that a substantial difference in the level of welfare still remains between the two groups. The lower human capital accumulation among non-Kinh presented in Table 6 would suggest that convergence between the living standards of the two groups may take some time to realise.

There are even more notable differences in child labour outcomes for children of non-Kinh and Kinh descent, particularly in older age groups. In 2014, ethnic minority children in the 10–14 year old age group work on average 13.6 days outside of the home while children of Kinh households work only 3.8 days on average. Differences are most notable in agricultural work.

For example, in 2014, children aged 10–14 of ethnic minority households worked on average 11.6 days in the previous year in agricultural activities (down from 26.8 in 2008). This is compared with 2.4 days on average for children of the same age from Kinh households. Among the 15–18 year old age group, children of ethnic minority households worked on average 30 days in agricultural activities compared with only 8.7 for non-Kinh children of the same age. Kinh children in this age group do, however, spend more days working for a wage (18.4) than non-Kinh (8.08). Overall, while welfare outcomes have improved for all children the gains made have not been enough to close the large gap in welfare between children of ethnic minority households compared with those of Kinh descent. This is particularly the case for children over 10 with the biggest gaps apparent in the 15–18 year old age group.

4 Panel study

In this section we attempt to identify the key household characteristics that are related to differences in the welfare outcomes of children. For this analysis we create a household panel from 2008 to 2014, which tracks each child present in each household in 2008 through each round of the survey up to 2014. For each welfare outcome we estimate the following model:

$$wel_{iht} = \boldsymbol{\beta}\mathbf{X}_{ht} + \delta_1 female_{iht} + \delta_2 age_{iht} + \alpha_h + \tau_t + \varepsilon_{iht}$$

where $well_{iht}$ is the welfare measure for child i in household h in time t; $\mathbf{X}_h$ is a vector of household specific variables including characteristics of the household head, income, land ownership, migration status of the household, the presence of a household enterprise, and the incidence of natural and economic income shocks;[6] *female* is a dummy indicator for whether the child is female; *age* is the age in years of the child; a_h are household fixed effects; τ_t are time dummies; and ε_{iht} is a statistical noise term.

This model allows us to explore both individual and households factors that are related to the welfare of children. The inclusion of household fixed effects controls for all time invariant household specific factors, such as, for example, ethnicity, geographical location, and other unobservable factors impacting on child welfare. The time dummies control for any macroeconomic changes over time affecting all children equally. As such we are analysing the within household variation in children's outcomes within and across time. The vector of household variables included in $\mathbf{X}_{ht}$ allows us to disentangle the household specific factors that are related to the welfare of children although care should be taken in inferring any causality from these results. The coefficient δ_1 will tell us the extent to which welfare outcomes are better or worse for girls compared with boys in the same household. The inclusion of the age of each child will control for the fact that welfare outcomes vary across age group as was evident from the cohort analysis presented in Section 3.

We focus on five main welfare indicators: i) whether the child attends school; ii) the years of education of the child; iii) the total number of days the child worked outside of the home; iv) the total number of days the child worked in agriculture in the last year; and v) the total number of days the child worked for a wage. The results are presented in Table 7.

We first consider the full sample of children aged 5 to 18. A number of household characteristics are found to be correlated with child welfare outcomes. Children with older heads of household

[6] The ethnicity of the household head and other time invariant household characteristics will be absorbed by the household fixed effect.

are more likely to attend school and spend fewer days working outside of the household. This is due to fewer days spent in waged employment (column 5). Having a head of household with higher level education (more than second level education) is positively correlated with the child attending school. A negative correlation is observed between household income and the probability that children attend school. In larger households children are less likely to attend school and have fewer years of education.

Table 7: Panel data analysis of determinants of child welfare, 2008–14, 5–18 year olds

	(1) Attends school	(2) Years of education	(3) Days worked	(4) Days worked agriculture	(5) Days worked wage
Household characteristics:					
Age	0.012***	-0.001	-0.462**	-0.116	-0.346**
	(0.001)	(0.005)	(0.206)	(0.128)	(0.142)
Married	0.034	0.251	-0.843	3.595	-4.120
	(0.043)	(0.172)	(4.610)	(2.843)	(3.272)
Female	-0.007	0.060	0.133	0.954	-2.205
	(0.052)	(0.214)	(5.045)	(2.909)	(3.977)
Higher Ed	0.046*	-0.049	-2.647	-2.959	0.320
	(0.025)	(0.082)	(2.535)	(2.049)	(1.486)
HH Size	-0.019**	-0.084**	0.693	-0.743	1.402*
	(0.008)	(0.039)	(1.013)	(0.718)	(0.750)
Income	-0.026***	-0.039	5.962***	-0.094	4.827***
	(0.008)	(0.036)	(1.186)	(0.770)	(0.820)
Loans	-0.001	-0.005	-0.010	-0.025	0.015
	(0.001)	(0.005)	(0.141)	(0.095)	(0.099)
Land area	-0.001	-0.000	-0.072	0.355*	-0.395***
	(0.002)	(0.007)	(0.249)	(0.204)	(0.136)
Land area squared	0.000	0.000	-0.002	-0.003***	0.002***
	(0.000)	(0.000)	(0.001)	(0.001)	(0.001)
Household enterprise	0.009	0.040	-1.194	-1.390	-3.972**
	(0.016)	(0.061)	(2.129)	(1.310)	(1.541)
Durables	0.004	0.054***	0.259	0.161	0.227
	(0.004)	(0.021)	(0.672)	(0.418)	(0.471)
Red Book	0.027	0.233***	0.680	1.280	-1.461
	(0.020)	(0.078)	(2.569)	(1.773)	(1.566)
Natural Shock	0.020*	0.066	2.050	0.335	1.999*
	(0.011)	(0.052)	(1.513)	(1.066)	(1.074)
Economic Shock	0.012	-0.061	2.664	3.039**	-0.652
	(0.013)	(0.053)	(1.839)	(1.222)	(1.330)
Child characteristics:					
Female	-0.011	-0.016	3.162*	2.186**	0.639
	(0.013)	(0.066)	(1.658)	(1.019)	(1.216)
Age	0.012***	0.763***	5.551***	2.800***	2.163***
	(0.002)	(0.012)	(0.246)	(0.153)	(0.190)
Observations	9,882	8,784	9,889	9,889	9,889
Number of HH	2,100	1,981	2,100	2,100	2,100

Note: Each model includes household and time fixed effects. Robust standard errors clustered at the household level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Source: Authors' calculations based on survey data from VARHS 2008-14.

Children in higher income households spend more days working outside of the household (column 3), particularly in waged work (column 5). This suggests that in higher income households, children play a role in supporting household income through working. This, however, may come at the expense of children not attending school given the negative association found between income and school attendance.

There is very little evidence that the assets of the household impact on welfare outcomes. Basu et al. (2010) suggest that the relationship between child labour and land holding may not be linear, but resemble an inverted-U relationship. We do find that the number of days worked in agriculture increases as the land size increases, but at a decreasing rate. However, in the case of Viet Nam, it seems that the turning point is at extremely high values of land holdings. Therefore we can conclude that the relationship between child labour in agriculture and land holdings is non-linear and on the positive-sloped side of the reversed-U relationship. The opposite relationship emerges when we consider the number of days worked for wage: the larger the land holdings, the less likely children are involved in waged work, but at a decreasing rate.

A positive association is found between the ownership of durable goods (a measure of household assets) and the years of educational attainment of children. Similarly, children have more years of education in households that have a land use certificate. Both are suggestive of some positive correlation between wealth and educational investments in children.

Following Edmonds and Turk (2004), we also include a dummy variable that captures whether the household runs an enterprise. While we do not find any impact of household enterprises on education, we do provide evidence that the number of days worked for wage is lower when a household enterprise is present. It is indeed likely that children are employed in the household enterprise rather than working outside the household.

In households that experience natural shocks (floods, droughts, pest infestations), children spend more days working in waged employment while in households that experience economic shocks (illness, unemployment, shocks to input or crop prices, etc.), children spend more days working in agricultural activities. Both of these results suggest that households use child labour as a shock-coping mechanism. In the case of natural shocks children are put to work in waged employment given that natural shocks usually affect the agricultural activities of households. In the case of economic shocks child resources are diverted into agriculture, perhaps to enable other household members to enter waged employment or work in household enterprises.

Our panel data results confirm our findings from the cohort analysis that there are differences in the welfare outcomes of boys and girls. In particular we find that controlling for the age of the children, girls are more likely to have experienced sickness in the previous two weeks than boys and girls spend more days working outside of the home. In particular, girls spend more days engaged in agricultural activities than boys.

In the next step of our analysis we focus specifically on households that include children aged 10–15 given that they are the most vulnerable in terms of exposure to child labour and consequentially negative impacts on education outcomes. We estimate the same regression model above for the same set of welfare outcomes. The results are presented in Table 8.

Fewer of the household characteristics are statistically significant once the sample is reduced to 10–15 year olds. We find that children are less likely to attend school and have fewer years of schooling in larger households. They are also more likely to work for a wage outside of the home. Children in higher income households also spend more days working, particularly in waged employment, suggesting that there are cases where household income is being supported by child labour. Exposure to both natural and economic shocks also increases the number of days that children aged 10–15 spend working outside of the household, particularly in agriculture.

Table 8: Panel data analysis of determinants of child welfare, 2008–14, 10–15 year olds

	(1) Attends school	(2) Years of education	(3) Days worked	(4) Days worked agriculture	(5) Days worked wage
Household characteristics:					
Age	0.003	-0.003	0.154	-0.002	0.002
	(0.002)	(0.007)	(0.332)	(0.230)	(0.175)
Married	-0.003	0.014	-6.548	-3.748	-0.936
	(0.064)	(0.138)	(6.937)	(6.317)	(3.149)
Female	-0.046	-0.112	-7.440	-3.030	-5.749
	(0.065)	(0.177)	(7.967)	(5.480)	(5.277)
Higher ed	-0.018	-0.063	-0.427	-0.806	0.392
	(0.024)	(0.119)	(5.302)	(4.371)	(0.510)
HH Size	-0.044***	-0.104**	0.734	-1.198	1.458**
	(0.012)	(0.050)	(1.524)	(1.308)	(0.602)
Income	-0.010	-0.023	2.552*	-0.435	2.147***
	(0.008)	(0.039)	(1.441)	(1.134)	(0.763)
Loans	0.000	-0.004	0.127	0.139	0.037
	(0.001)	(0.006)	(0.189)	(0.140)	(0.106)
Land area	-0.004	-0.011	0.023	0.132	-0.092
	(0.003)	(0.012)	(0.449)	(0.428)	(0.107)
Land area squared	0.000	0.000	-0.001	-0.002	0.001
	(0.000)	(0.000)	(0.004)	(0.004)	(0.001)
Household enterprise	0.008	-0.023	1.247	-1.575	-1.273
	(0.015)	(0.078)	(2.823)	(2.082)	(1.316)
Durables	0.006	0.078***	1.240	0.850	0.405
	(0.005)	(0.030)	(0.867)	(0.542)	(0.617)
Red book	0.023	0.151	-1.708	-1.648	-0.604
	(0.021)	(0.100)	(3.360)	(2.695)	(1.618)
Natural shock	0.011	0.024	4.220**	2.717*	1.162
	(0.012)	(0.064)	(1.860)	(1.526)	(0.891)
Economic shock	0.024*	0.093	2.084	3.540*	-1.372
	(0.013)	(0.063)	(2.552)	(2.034)	(1.203)
Child characteristics:					
Female	-0.003	-0.009	0.286	0.400	0.730
	(0.015)	(0.083)	(2.114)	(1.584)	(1.155)
Age	-0.029***	0.841***	6.189***	4.202***	1.387***
	(0.003)	(0.017)	(0.474)	(0.364)	(0.275)
Observations	4,349	4,349	4,350	4,350	4,350
Number of HH	1,421	1,421	1,421	1,421	1,421

Note: Each model includes household and time fixed effects. Robust standard errors clustered at the household level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Source: Authors' calculations based on survey data from VARHS 2008-14.

As highlighted in the introduction, there is a large literature which suggests that female empowerment, and in particular an increase in the resources held in the hands of women, is beneficial for children. An increase in female bargaining power within the household is expected to decrease child labour, especially among girls. In her seminal paper, Duflo (2003) explores the link between an old age social pension programme and child health in South Africa. The pension is found to positively affect girls' health, while no effect is found on boys. Qian (2008) analyses the effects of increases in sex-specific income on children in China: an increase in female income is found to lower child mortality among daughters and to have a positive effect on educational measures for all children. A rise in male income has no effect on boys, but it raises child mortality among daughters and worsens girls' educational attainment.

To explore this possibility in the Vietnamese case we consider two indicator variables for the empowerment of women within the household: i) an indicator variable for whether a woman manages the land owned by the household; and ii) the proportion of total days worked by

women for a wage. The latter is considered an indicator of female empowerment on the basis that income earned through waged employment is more likely to be under the control of the person who earned the income. We include each of these indicators in the regression models. The results are presented in Table 9. Only results for the empowerment variables are presented for ease of illustration but each model includes the full set of household and individual control variables.

Table 9: Panel data analysis of determinants of child welfare, 2008–14, 10–15 year olds

	(1) Attends school	(2) Years of education	(3) Days worked	(4) Days worked agriculture	(5) Days worked wage
Empowerment Indicators					
Female Manager	0.033***	0.087	0.145	-1.516	1.078**
	(0.012)	(0.072)	(2.151)	(1.909)	(0.546)
Proportion total days worked by women that are spent in waged employment	0.005	-0.037	-9.508**	-9.493***	1.276
	(0.020)	(0.115)	(3.920)	(3.055)	(1.837)
Observations	3,427	3,427	3,428	3,428	3,428
Number of HH	1,064	1,064	1,064	1,064	1,064

Note: Each model includes household and time fixed effects and the full set of household and individual characteristics included in Table 8. Robust standard errors clustered at the household level in parentheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$.

Source: Authors' calculations based on survey data from VARHS 2008-14.

There is some evidence to suggest that in households where a woman is responsible for managing the land owned by the household, children are more likely to attend school. It is also the case that in households where women spend a greater proportion of their time working for a wage, as opposed to other types of activities, children work significantly fewer days and in particular work significantly fewer days in agricultural activities. These findings are consistent with the literature discussed above.

5 Conclusions

This paper investigated how the lives of the children and youth living in rural Viet Nam have been affected by the significant structural transformation experienced in Viet Nam over the last decade. We analyse different aspects of child wellbeing: health, education attendance and attainment, and engagement in labour (agricultural, household enterprise, and waged employment). The analysis depicts a society that has made great progress towards improving child welfare. Over the span of six years, the health of children and young people has improved. School attendance has also increased, in particular for children above the age of ten. This is particularly notable given that this age group is past the age of compulsory primary school. We also observe a decrease in child labour, which is even more notable for the most vulnerable age group, the young cohort.

Many challenges, however, still lie ahead. While both girls and boys have experienced improvements in health and schooling outcomes, we find that boys benefitted more than girls. Similarly, while wellbeing has increased over time for both minority and non-minority groups, our analysis highlights the fact that a substantial difference in the level of welfare still remains between the two groups. Of particular concern is the widening gap in educational outcomes.

With slower rates of human capital accumulation for the poorest groups in society, convergence in living standards will be more difficult and will take a longer time to attain.

Nevertheless, the large gains in the welfare of children in Viet Nam over the last eight years is a strong signal that structural transformation is paving the way for a better standard of living for the next generation and future generations to come.

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