Beyond the Basics: Access and Equity in the Expansion of Post-Compulsory Schooling in Vietnam

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Abstract

Human capital development through the provision of equitable, quality basic education has been central to Vietnam's strong and relatively inclusive growth in recent years. However, to avoid the 'middle-income trap', Vietnam now needs to ensure access and quality of post-basic education. To this end, the country's Education Sector Strategic Development Plan (2011-2020) aims to ensure that 80% of Vietnamese young people within the relevant age group complete upper secondary education by 2020. Since the aim is not to achieve universal access to upper secondary education, the mechanism by which access is rationed must be fair, or equitable. Using unique longitudinal household and school data from the Young Lives survey, we therefore seek to establish the extent to which access to upper secondary education in Vietnam is equitable, and whether learning outcomes are equitable for students who have progressed to Grade 10 (the first year of upper secondary school). We conclude with reflections on the implications of these findings for the provision of more equitable access and learning outcomes beyond basic education in Vietnam, in order to meet the needs of the twenty-first century economy.

1. Introduction

Human capital development has played a crucial role in Vietnam's strong and relatively inclusive economic growth in recent years. Education policies have clearly been successful in both delivering mass access and ensuring basic skill development by age 15, evidenced not least by the country's stellar performance in PISA, in which its 15 year olds were ranked 17th in Maths (2012) and 8th in Science (2015). Moreover, Vietnam's high performing school system is particularly impressive in light of recent global trends in education. While access to schooling has expanded dramatically across the world since the Millennium, with a majority of children even in the poorest countries now able to attend primary school (UNESCO 2013), education systems typically face a 'trade-off' between quantity and quality during periods of rapid expansion in educational provision, with potentially negative impacts on learning outcomes (Rolleston 2016).

Vietnam is an exception to this pattern; by achieving both mass enrolment and learning in tandem, the country has apparently avoided a quantity-quality trade-off (Rolleston 2016). The net primary enrolment rate in Vietnam increased from 85.6% in 1992-3 to 98.0% by 2014, while the net lower secondary enrolment rate also increased over this period from 72.3% in 1992-3 to 94.8% in 2014 (Dang & Glewwe 2017). At the same time, nationally representative data on learning outcomes at Grade 5 indicate significant improvements in both Vietnamese language skills and Maths between 2001 and 2007 (Dang & Glewwe 2017). Further, at least at primary level, disadvantaged students receive relatively equitable access to quality education (World Bank 2011; Rolleston & Krutikova 2014).

'Inclusive growth' depends substantially on ensuring a growth trajectory which emphasises the expansion of relatively labour-intensive production while at the same time raising incomes, not least through improved productivity as a result of skills development (Ali & Son 2007; Anand et al 2013). 'Moving up the value-chain' in economic terms is a clear objective of economic policy in Vietnam and education policy forms a key pillar of a range of measures intended to support such development. However, upper secondary education (the final phase of schooling) is not compulsory, and is often costly to households. Access remains strongly linked to resources and for the most disadvantaged children, direct, indirect and opportunity costs of upper secondary school are sometimes prohibitive.

In this paper we employ unique household and school survey data from Young Lives, an international study of childhood poverty, to examine the determinants of access to Grade 10 (i.e., the transition from lower to upper secondary school), and to consider the extent to which access to post-basic education is equitable in Vietnam. We proceed to examine the extent to which the determination of learning outcomes in Grade 10 is equitable, and conclude by considering how Vietnam can provide for more equitable access and learning outcomes beyond basic education, in order to meet the needs of a twenty-first century economy.

The key questions addressed in the paper are as follows:

1. What are the characteristics of children who successfully make the transition to Grade 10?
2. What are the factors associated with learning outcomes in Grade 10?
3. What are the patterns of inequality and inequity in access and learning outcomes in Grade 10?

2. Background and Literature

Conceptualising educational access and learning outcomes

Household decisions relating to participation in schooling are determined by multiple factors which influence the supply of and demand for schooling. On the supply side, these factors include physical access to schools, school quality and the costs of schooling; on the demand side, factors include family income and educational preferences (among many others). Schooling decisions may be analysed within the cost-benefit analysis

framework of Becker's household production function (Becker 1964), as they may be considered as part of a household's welfare maximisation or long term utility strategy. The framework conceptualises family investment decisions in education as driven by the long term net benefits of such investments, when compared to alternatives, subject to family budget constraints.

Among the most important outcomes of educational processes are individual students' subject knowledge and cognitive skills. These outputs may be considered the result of educational 'production processes' which serve to combine school-level inputs (e.g. school infrastructure, teachers, curricula etc.), household-level inputs (wealth, parental education) alongside individual characteristics (gender, ethnicity) to produce educational outcomes. The 'education production function' provides a simple model of the relationships between these inputs and outcomes, which has played a key role in informing policymakers concerning the determinants of educational achievement, and concerning the importance of particular inputs into the education 'production process' (Hanushek 1989).

These two simple economic models provide the basis for our empirical modelling of the determinants of enrolment and achievement in Grade 10 in Vietnam. However, such approaches do not provide direct answers to questions of equity, where a value judgement is required. Some definitions of equitable educational access, based in a human rights approach, view exclusion from any level of education as discriminatory (UNESCO 1960); following this definition, access to upper secondary education must be available to all if access is to be equitable. However, more recent definitions of 'education for all' on a global level (e.g. Sustainable Development Goal 4.1) and in Vietnam (as discussed below) do not extend beyond lower secondary education. If the principle of universal access is not to be used as the equity criterion, perhaps owing to limitations of resources, there must be an 'allocation mechanism' by which students are granted access to post-basic education. It might be argued that the fairest system is a lottery, or alternatively, that a merit-based system ensures the fairest distribution of access. In the latter case, if 'merit' is understood as students' ability and potential, then in order to ensure equitable access it is important that these attributes are assessed fairly, and that they are not confounded with student levels of home advantage.

Upper secondary education in Vietnam

Education is compulsory at primary (Grades 1-5) and lower secondary (Grades 6-9) levels in Vietnam, while upper secondary schooling (Grades 10-12) is 'voluntary'; access is typically determined by performance on a school-level entrance exam, and usually requires payment of fees (Nguyen & Nguyen 2007; World Bank 2013). Nonetheless, access to upper secondary education has increased markedly over the past 20 years, from only 27.2% in 1992-93 to 72.4% in 2014 (Dang & Glewwe 2017). This trend is testament to increasing demand for education, linked in part to rapid economic growth and a rising level of education among parents, as well as other factors such as rapid expansion in supply as a result of large-scale school construction. As Dang & Glewwe (2017) have noted, the rise in upper secondary enrolment amounts to a dramatic change from a relatively elite system available to only one in four children to a much more accessible and equitable system accessed by almost three in four children.

Upper secondary schooling serves as a gateway to access to higher education and, in turn, to some of the highest 'returns to education', at least in comparatively in more developed economies. Returns to college and university education among wage workers in Vietnam rose to 80% in 2008, while upper secondary graduates in wage work could expect to earn 30% more than primary school graduates (World Bank 2014). Upper secondary and college graduates also arguably have access to the most prestigious and rewarding labour market opportunities. Moreover, strong demand for secondary and higher education graduates has remained robust during Vietnam's recent years of economic slowdown, particularly in the urban private sector, while demand for less educated workers has been declining (World Bank 2014).

In terms of national development, Vietnam aims to 'skill up' its young people in order to meet the needs of a rapidly expanding economy and create a highly skilled workforce able to compete alongside other countries in the region (Le Thuc & Nguyen 2014: 1). Given intensifying global competition, widening access to upper secondary education is arguably essential in pursuit of this aim, and is consequently an area of growing policy interest in the country (World Bank 2014; London 2010). Gross enrolment rates in upper secondary education are relatively high in Vietnam compared to other Southeast Asian economies, but fall short of enrolment rates in more developed East Asian countries such as Korea. If Korea is 'where Vietnam wants to go in the future', then access to upper secondary education needs to expand; Vietnam's current upper secondary enrolment rate is comparable to Korea's in the 1980s (World Bank 2014: 95).

Vietnam's Education Sector Strategic Development Plan (2011-2020) aims to ensure that 80% of Vietnamese young people within the relevant age group complete upper secondary education by 2020 (Asian Development Bank 2012). In equity terms, if access to the opportunities afforded by upper secondary education are not universal, then it is important to ensure that the process by which access is 'rationed' operates fairly. While private provision supplies a small proportion of upper secondary school places in Vietnam for wealthier groups[1], public provision represents the only option for the majority and remains the preferred option for all but the most economically advantaged students, conditional on their ability to meet the entry requirements.

As discussed above, Vietnam has become known for both its high-quality education performance and its higher-than-average quantity of school achievement, seemingly at all levels of the basic education system (Dang & Glewwe 2017). Moreover, the relatively short cycle of nine years of basic school, low number of hours of official instruction and low levels of grade repetition suggest high levels of efficiency in the system. However, while equitable access and high levels of learning outcomes at primary and lower secondary levels have been established, questions remain about access to and learning outcomes at upper secondary level.

National data indicate that there are significant equity issues with regard to access to upper secondary level in Vietnam. For example, only 50% of ethnic minority children progressed to Grade 10 in 2014 compared to 79% of ethnic majority (Kinh/Hoa) children (Dang & Glewwe 2017). While there have been several attempts to 'unravel the secret' of Vietnam's success in delivering strong cognitive skills following the country's PISA performance (Bodewig 2013; Parandekar & Sedmik 2016; Glewwe et al 2017), it is important to note that the PISA tests are administered to 15 year olds who are mostly enrolled in Grade 10, so that the results may 'overstate' performance as well as failing to represent the achievement of disadvantaged students. As Glewwe et al (2017) have shown, Grade 10 is comprised of relatively advantaged and high-performing students, with important implications for the interpretation of PISA results with regard to skill levels of 15 year olds nationally. To date, little evidence is available on those who do not progress to Grade 10. Accordingly, rather than examining the 'secrets of success' in the Vietnamese basic education system, we focus on access and learning outcomes at upper secondary level. In light of Vietnam's plans to 'move up the value chain', and of the higher order cognitive, social and behavioural skills required for a twenty-first century economy; equitable access to upper secondary school and equitable learning outcomes at that level of schooling are fundamental to ensuring the effective development of talent for the country's future development.

[1] Private provision at upper secondary level is considerably higher than at primary and lower secondary level; 27.1% of all upper secondary students were enrolled in private schools in 2007-8, compared to 6.0% of students enrolled in private primary and lower secondary schools (Lieu 2011).

3. The Young Lives Survey and Methods

Young Lives is a longitudinal study of childhood poverty in Ethiopia, India, Peru, and Vietnam. It has followed a total of 12,000 children, divided into two age cohorts, over the course of 15 years: an 'Older Cohort' born in 1994-95, and a 'Younger Cohort' born in 2001-02. In all four countries, a sentinel-site sampling design is employed, comprising twenty purposively selected sites chosen to represent national diversity, but with a pro-poor bias. At the site level, children in both birth cohorts were selected randomly in 2001, so that the data are representative of the birth cohort in each site.

The sites in Vietnam are clustered in five provinces: Lao Cai, Hung Yen, Da Nang, Phu Yen and Ben Tre[2]. Each province contains four sites, and each site is formed of one or two communes, totalling 36 communes within 14 districts. Data have been collected from the households of the index children every 3-4 years from 2002-2015, while school-level data collection began in 2011-12 at the schools of the Younger Cohort children who were then enrolled in Grade 5 (Rolleston et al 2013). A second round of school-level data collection took place in 2016-17, at all upper secondary schools in the 14 Young Lives districts. This sampling approach was taken in order to ensure a high chance of including students who participated in the previous Grade 5 survey as well as those in the Young Lives Younger Cohort. The 2016-17 school survey was conducted in Grade 10, as this was the grade in which the majority of Younger Cohort children were expected to be enrolled.

The Vietnam primary school survey (2011-12) was conducted in 56 schools (or 92 school sites when satellite sites are considered separately) in the 20 Young Lives sentinel sites, and included 3,284 Grade 5 students (1,138 of whom were Young Lives Younger Cohort children). The Vietnam secondary school survey (2016-17) was conducted in 52 schools in the 14 Young Lives districts, with 8,740 students (including 442 Young Lives Younger Cohort children and 618 of their peers from the Grade 5 survey). A more detailed discussion of the sampling and survey design of the primary and secondary school surveys can be found in Rolleston et al (2013) and Iyer (2016) respectively.

In order to address the question of access to Grade 10, we analyse five rounds of household data collected from the 2,000 Younger Cohort children between 2002 and 2016 (section 4.1). We statistically compare the characteristics of Younger Cohort children who were enrolled in Grade 10 in 2016-17 with those who were eligible to be enrolled in the same year, but were no longer in school. We then use regression analysis, employing a dichotomous outcome (probit) model, to report the probability of enrolment in Grade 10.

Subsequently, in order to examine learning outcomes in Grade 10 (sections 4.2, 4.3 and 5), we analyse school survey data from a sub-sample of Younger Cohort children and their peers who participated in both the primary school and secondary school surveys – a total of 1,060 children. We examine the effects of these students' background characteristics, including achievement and school quality at Grade 5, on their achievement in Maths at the beginning of Grade 10. We first use a simple linear regression model, and then introduce 'district fixed effects' so that results only compare students with their peers within their district. See Appendices 1 and 2 for summary statistics of variables included in the analysis.

4. Findings

4.1 Which children make the transition to Grade 10?

In Vietnam, children are expected to enrol in Grade 1 in the calendar year that they turn 6 years old, so that Younger Cohort children born in 2001 would normally have enrolled in Grade 1 in 2007 and, assuming correct age-for grade progression[3], would have enrolled in Grade 10 in 2016. Of the 1,551 Younger Cohort children

[2] See Rolleston et al (2013) for a detailed description of the Young Lives sites in Vietnam.

[3] The most recent figures for Vietnam reveal very low levels of grade repetition at primary level (1.02% in 2013) and lower secondary level (1.16% in 2013) (MOET 2015).

born in 2001 (those eligible to enrol in Grade 10), 64.9% were in fact enrolled in Grade 10, while 8.78% were enrolled in other grades, and 19.3% were no longer in school (Table 1). The enrolment figure is somewhat lower than the national estimate of 72.4%, likely linked to the pro-poor selection of sites in the Young Lives sample. Around half of the Younger Cohort children (52.3%) as a whole were enrolled in Grade 10 in 2016-17, with 20.2% enrolled in Grade 9, and 17.56% not enrolled in school (Table 1).

Table 1: Younger Cohort school enrolment, 2016-17

School enrolment, 2016-17	Eligible for Grade 10 (born in 2001)		Not eligible for Grade 10 (born in 2002)		*No information*[4]		Total	
	No.	%	No.	%	*No.*	*%*	No.	%
Not in school	300	19.34	45	11.31	*1*	*5.56*	346	17.56
Grade 8	8	0.52	9	2.26	*0*	*0*	17	0.86
Grade 9	104	6.71	293	73.62	*1*	*5.56*	398	20.2
Grade 10	1006	64.86	21	5.28	*3*	*16.67*	1031	52.34
Grade 11	24	1.55	1	0.25	*0*	*0.00*	27	1.37
No information	*109*	*7.02*	*29*	*7.29*	*16*	*88.88*	*139*	*7.06*
Total	1551	100	398	100	*18*	*100*	1970	100

In order to understand more about the differences between those who do and do not make the transition to Grade 10, we compare the Younger Cohort children in Grade 10 in 2016 (n = 1,031) with the out-of-school Younger Cohort children who were eligible to enrol in Grade 10 in the same year (n = 300) in Table 2. This reveals significant differences between the two groups in terms of household wealth (with children in Grade 10 from wealthier households on average). We also compare prior performance in Maths between the two groups, measured by a standardised score on a Maths test administered to sampled children when they were 12 years old in 2013 (Round 4 of the Young Lives household survey)[5]. This reveals significant differences between the two groups, with those in Grade 10 scoring higher on average than those who are no longer enrolled in school.

There are also significant differences in the proportions of children who progress to Grade 10 when comparing across more and less advantaged social groups, as reported in Table 3. More than four fifths of eligible ethnic majority (Kinh) children were enrolled in Grade 10 at the time of the survey, compared to just under half of all ethnic minority children[6]. A sizeable gap (of more than 8 percentage points) is found in terms of the proportion of girls compared to boys enrolled in Grade 10. The gap in the proportions of children enrolled in urban compared to rural areas is twice as large as the gender gap, at more than 16 percentage points. The largest gap among these selected indicators is found when comparing children by level of caregivers' education. Almost 90% of children whose main caregiver has six or more years of education (i.e. lower secondary education or higher) are in Grade 10, compared to less than 60% of those whose main caregiver has five or fewer years of education (i.e. primary education or lower).

[4] Includes attrition, non-response, refusal.

[5] Raw scores on the Maths test were transformed to a common scale, using a two-parameter item-response theory (IRT) model to produce estimates of children's latent ability or performance trait (θ), which takes account of item difficulty and discrimination between students. The tests have been scaled to have a mean of 500 and standard deviation of 100.

[6] 85% of the Younger Cohort sample are from ethnic majority (Kinh) backgrounds. Of the remaining 15%, the largest ethnic minority group represented is H'mong (5.5%), with a smaller proportion of children from Dao (1.8%), Tay (1.7%), Nung (1.5%) and Ba Na (0.3%) backgrounds.

Table 2: Differences between Younger Cohort children in Grade 10 and out of school, 2016

	In Grade 10	Out of school	Sig.
Wealth Index, 2013	0.64	0.55	***
Maths Test Score, 2013	525.94	447.22	***

t-test significance: ***p<0.01, **p<0.05, *p<0.1.

Table 3: Differences between Younger Cohort groups in Grade 10, 2016

	Boys (%)	Girls (%)	**Sig.**	Ethnic minority (%)	Ethnic majority (%)	**Sig.**	Urban (%)	Rural (%)	**Sig.**	Caregiver's education: 0-5 years (%)	Caregiver's education: 6 or more years (%)	**Sig.**
In Grade 10	73.41	81.65	***	48.93	80.84	***	89.77	73.54	***	58.22	87.54	***

t-test significance: ***p<0.01, **p<0.05, *p<0.1.

These indicators clearly represent forms of advantage or disadvantage that are closely linked, overlapping and mutually reinforcing. We therefore proceed to model the predictors of the probability of progressing to Grade 10 in a regression framework. We employ a dichotomous outcome (probit) model, taking the value 1 for enrolment in Grade 10 and 0 for being out of school. We report 'marginal effects' on the probability of enrolment (Table 4) at the mean for all predictor variables. We control for district-level effects, so that results compare children with their peers within each site. District-effects include those linked to school supply alongside common geographic, economic, cultural and demographic factors at the site-level. We estimate two models: in the first model, we include sex, ethnicity, caregiver's education and household wealth in 2013. In the second model, we add an indicator of prior Maths performance, again using standardised scores from the Maths test administered to sampled children in 2013.

Table 4: Probability of being enrolled in Grade 10 in 2016

VARIABLES	(1) Grade 10 enrolment without prior test scores	(2) Grade 10 enrolment with prior test scores
Female	0.108***	0.0938***
	(0.0227)	(0.0214)
Ethnic minority	-0.109**	-0.0330
	(0.0498)	(0.0470)
Main caregiver's education (6 or more years)	0.176***	0.137***
	(0.0303)	(0.0291)
Wealth index, 2013	0.658***	0.443***
	(0.116)	(0.109)
Maths score, 2013	-	0.00115***
	-	(0.000132)
Observations	1,298	1,257

Controls included for site-level effects.
Standard errors in parentheses: *** p<0.01, ** p<0.05, * p<0.1

Prior Maths performance is a strong predictor of progression to Grade 10 (column 2 in Table 4); reflecting merit-based progression, at least to the extent that Maths test results are a 'fair' reflection of ability and/or potential. However, students will have had somewhat unequal opportunities to develop their Maths performance in the past so that the prior score represents a measure of 'crystalised' abilty, effort and opportunity. Without controlling for prior test score (column 1 in Table 4), ethnic minority children are significantly less likely to progress to Grade 10. However, when taking account of prior Maths performance, ethnic minority status is not a significant predictor of progression. This suggests that children from ethnic minority backgrounds may not be additionally disadvantaged in terms of making the transition to Grade 10, beyond the significant disadvantage that is reflected in lower test scores at age 12. Lower test scores nonetheless do reduce the likelihood of accessing upper secondary school significantly, and the reasons for lower test scores among ethnic minority children are likely to reflect a pattern of historical inequality and inequity (see Appendix 3 for differences in performance according to child characteristics and family background, including ethnicity).

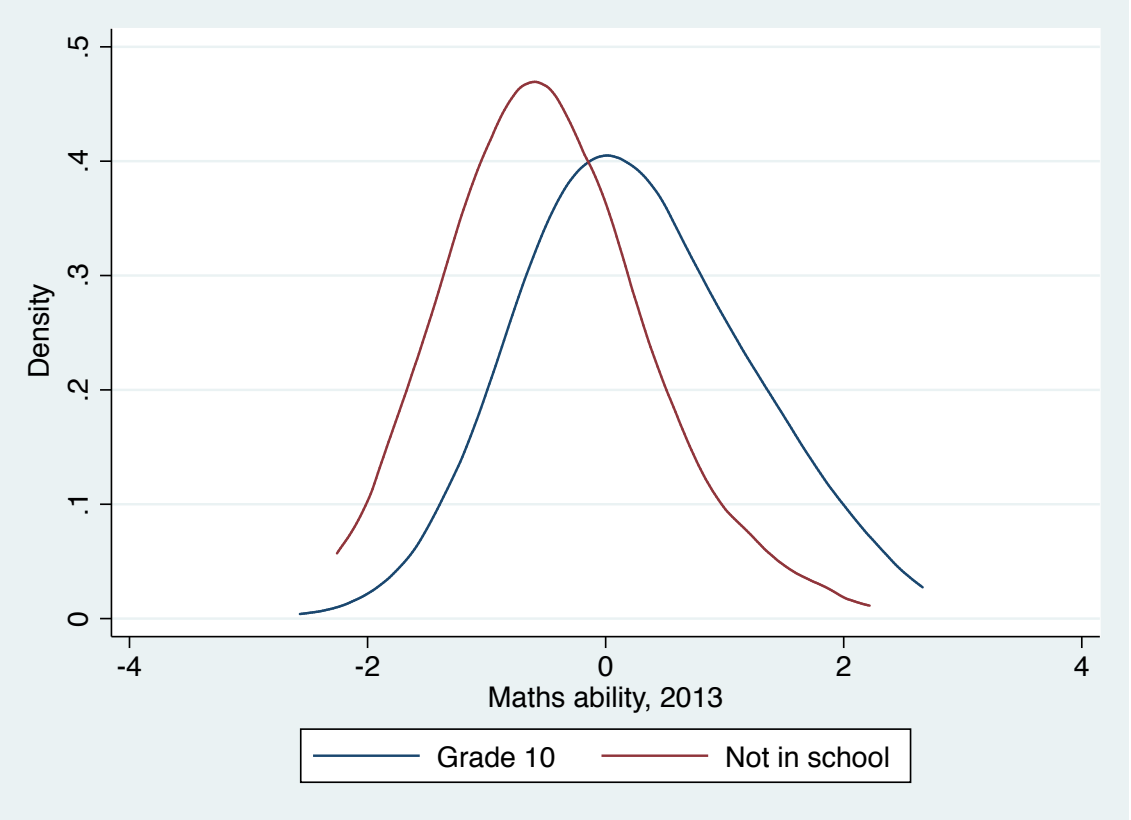
Taking account of Maths ability, children whose main caregiver has six or more years of schooling remain significantly more likely to progress to Grade 10 than those whose main caregiver has five or fewer years of education, while children from more advantaged backgrounds (measured by wealth index in 2013) are also more likely to transition to Grade 10, other things being equal. This suggests that the effects of parental education and factors correlated therewith continue to exert an influence in the later years.

Even when controlling for prior performance, girls are significantly more likely to progress to Grade 10 than boys. While this contradicts expectations that girls might be the 'disadvantaged' group in terms of educational access and progression during adolescence, as found in many other countries (e.g. Vennam et al 2016), it is consistent with findings on gender and transition to Grade 10 in Vietnam reported by Dang & Glewwe (2017). Previous findings from Young Lives suggest that these trends may be explained by expectations that boys enter the labour market once they reach adolescence; it may be the case that without similar pressures to start earning money, girls are more able to progress to higher levels of education during this period (Zharkevich et al 2016).

While it is clear that children's test scores in 2013 reflect both 'merit' and advantage, the use of school-level entrance exams to control access to Grade 10 entrenches advantage to the extent that it confounds merit and advantage. In Figure 1 below, we examine in indicative terms the overlap in test scores in 2013 between children who entered Grade 10 and those who did not. This shows that children who progressed to Grade 10 scored, on average, more highly than those who are out of school, but there is also a considerable overlap in the distribution of Maths test scores across these two groups. This further emphasises that higher ability alone does not ensure transition to Grade 10. While some students may choose not to progress, these findings also suggest that some high-ability students may be prevented from transition to Grade 10, for example by the costs of upper secondary education.

These findings indicate that access to post-basic education in Vietnam is clearly not as equitable as at earlier stages, where access is close to universal. Moreover, in an equitable system in which access is purely determined by merit, we would not expect wealth or caregiver's education to be a significant predictor of access after controlling for prior performance. Home advantage clearly plays an important role with respect to progression to Grade 10. While efforts are made in some provinces to reduce the required scores for progression (or even to waive the use of entrance exams entirely) in order to encourage disadvantaged children to transition to upper secondary school, these findings suggest that remedial action in earlier years may be required. For example, if disadvantaged students are the lower performers by the end of Grade 9, compensatory mechanisms earlier on in primary and lower secondary school may be needed to ensure that home disadvantage does not confound school performance.

Figure 1: Maths test scores (2013) for Younger Cohort children in Grade 10 and out of school



4.2 What are the factors associated with learning outcomes in Grade 10?

Having examined equity in access to post-basic education in Vietnam, we turn to learning outcomes in the first year of upper secondary education (Grade 10), and examine the extent to which these outcomes are equitable among those who do make it to this stage of education. We focus on a sub-sample of 1,060 students (442 of whom are Younger Cohort children) who participated in both the Young Lives primary and secondary school surveys, conducted when the students were in Grade 5 and Grade 10 respectively, since for this group we have longitudinal data on achievement in school. We examine effects on achievement in Maths at the beginning of Grade 10 of indicators of background characteristics, prior achievement and the quality of the school attended at Grade 5. We first use a simple ordinary least squares (OLS) linear regression model, and then employ a district fixed-effects model so as to compare students only with their peers within their district (Table 5)[7]. Grade 5 and Grade 10 test scores are presented here as scaled IRT scores, with the mean of each test set to 500 and standard deviation set to 100 for ease of interpretation.

Higher Maths test scores at the beginning of Grade 10 are strongly associated with higher Grade 5 test scores in Maths and Vietnamese, indicating that high-performing students at primary level continue, other things being equal, to be high performers at the start of upper secondary school. Home advantage (measured by household wealth index in Grade 5) and mother's education are associated with better learning outcomes, with wealthier students and those with university-educated mothers performing better at the start of Grade 10 even after taking into account their Grade 5 scores. This suggests a continuing influence of these forms of advantage across the schooling career from Grades 5 to 10, as well as an influence on selection into upper secondary education (as discussed above).

[7] As discussed above, while the Young Lives sentinel sites are made up of 1-2 communes, sites in the 2016-17 school survey consist of the 14 districts in which Young Lives communes are located.

It is important to note that other markers of disadvantage – ethnic minority status, speaking a minority language at home, eating fewer meals, health problems at primary school and grade repetition – are not significant predictors of learning outcomes at the beginning of Grade 10 in this 'value-added' model. By contrast, these variables are important predictors of achievement in both Maths and Vietnamese at Grade 5 when no prior achievement measures are included (see Rolleston et al 2013). One explanation for the apparent reduction in the influence of these variables is that their influence is primarily exerted earlier in the child's school career, and subsequently absorbed in Grade 5 test scores. In addition, however, the sample of students in Grade 10 is a relatively more advantaged sample than the full sample of students tested in Grade 5, and the influence of more basic socio-economic indicators for this group may be expected to be weaker. It is also worth noting that the quality of primary school attended – measured here by the value-added of one year of schooling in Grade 5 (see Rolleston et al 2013) – is not a significant predictor in our model. This suggests that we cannot detect any lasting effect of primary school quality on learning outcomes in Grade 10.

In the OLS model (column 1), students in Ben Tre, Phu Yen and especially Hung Yen perform significantly better than those in Lao Cai (the reference category). Province indicators serve to capture all influences common to students within the provinces, both on the supply (e.g. school quality) and demand sides. Lao Cai is the poorest province in economic terms and also the most geographically remote, so it may be expected that forms of socio-economic advantage common to students in other provinces and unobserved in our model would be reflected in significant province effects when compared to Lao Cai. However, Da Nang is the most economically advantaged province in the sample and the one in which students achieved the highest test scores in Grade 5 (see Rolleston et al 2013). While we cannot interpret these province effects straightforwardly, one possibility is that students in other provinces demonstrated relative 'catch-up' between Grade 5 and 10 compared to the more advantaged Da Nang students, who demonstrated high performance (linked to economic advantage) in the early years.

Table 5: Student background characteristics, primary schooling and Grade 10 Maths performance

VARIABLES	(1) OLS	(2) Fixed Effects
Grade 5 W1 Maths score (scaled IRT)	0.333***	0.356***
	(0.0348)	(0.0354)
Grade 5 W1 Vietnamese score (scaled IRT)	0.141***	0.140***
	(0.0338)	(0.0332)
School Value-Added, Grade 5	0.0155	-0.0669
	(0.0816)	(0.0897)
Female	0.396	-0.585
	(5.477)	(5.392)
Age	-7.950	-8.874
	(6.063)	(5.963)
Ethnic minority	-12.90	-17.53
	(12.12)	(11.93)
Wealth Index, Grade 5	7.357***	6.319***
	(2.087)	(2.084)
Mother's education = Secondary education	8.761	8.434
	(7.385)	(7.269)
Mother's education = Higher education	18.32*	18.83*
	(10.54)	(10.38)
Speaks Vietnamese at home	5.204	8.008
	(11.30)	(11.48)
Number of meals normally eaten per day	-0.347	-2.176
	(7.403)	(7.328)
Any health problems, Grade 5	-6.451	-6.172
	(6.532)	(6.438)
Number of books in the home	1.881	1.810
	(2.512)	(2.478)
Own place to study at home	-3.475	-2.634
	(7.740)	(7.621)
Repeated at least one school grade	-24.78	-24.88
	(16.77)	(16.55)
Ben Tre	25.31***	
	(9.558)	
Da Nang	-5.941	
	(9.960)	
Hung Yen	62.22***	
	(10.35)	
Phu Yen	20.94**	
	(9.969)	
Constant	365.2***	388.9***
	(98.08)	(96.53)
Observations	1,028	1,028
R-squared	0.295	0.242
Number of districts		14
District FE		Yes

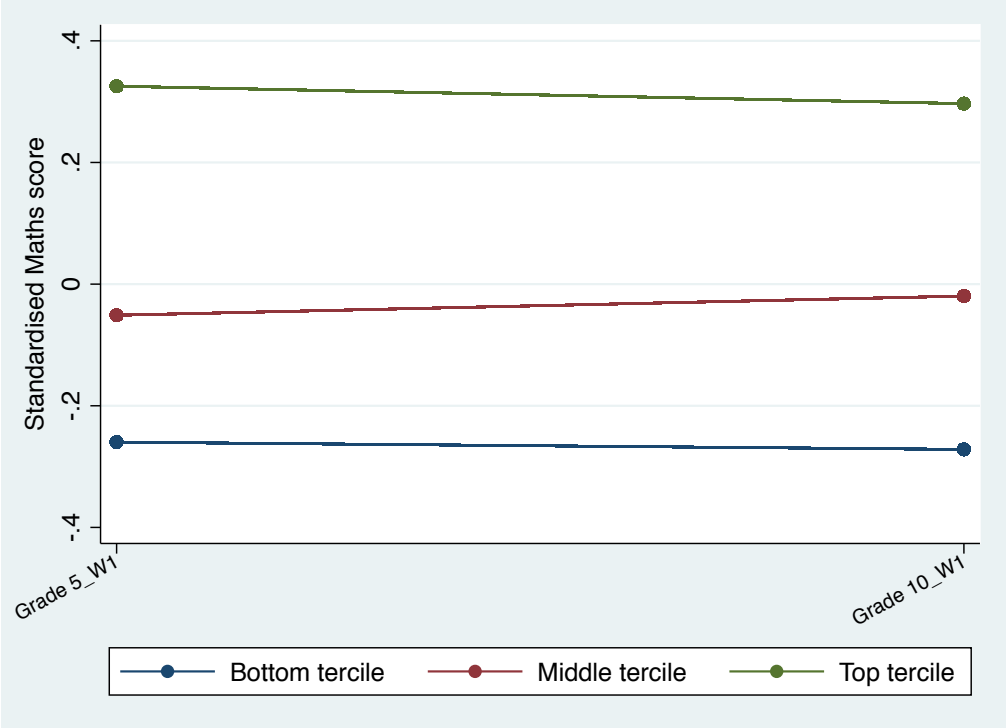
Standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1

Reference categories: Mother's education (Primary education); Province (Lao Cai)

4.3 Are there inequalities in student learning outcomes in Grade 10?

Making use of Maths tests administered at the beginning of Grade 5 and the beginning of Grade 10, it is possible to examine inequalities in Maths skills and their development over time[8]. Figure 2 illustrates the gaps in test scores by three groups (terciles) of students based on the wealth index from the Grade 5 school survey. In Grade 5, it is clear that by wealth, there are notable gaps in learning outcomes in Maths, with approximately 0.6 standard deviations between students' Maths scores in the top and bottom wealth terciles, and 0.3 standard deviations between students in the top and middle wealth terciles. In Grade 5, we found that a 'year of schooling' represents approximately 0.4 standard deviations on this Maths test (see Rolleston et al 2013), so we might interpret this first 'wealth gap' as equivalent to around 1.5 years of schooling.

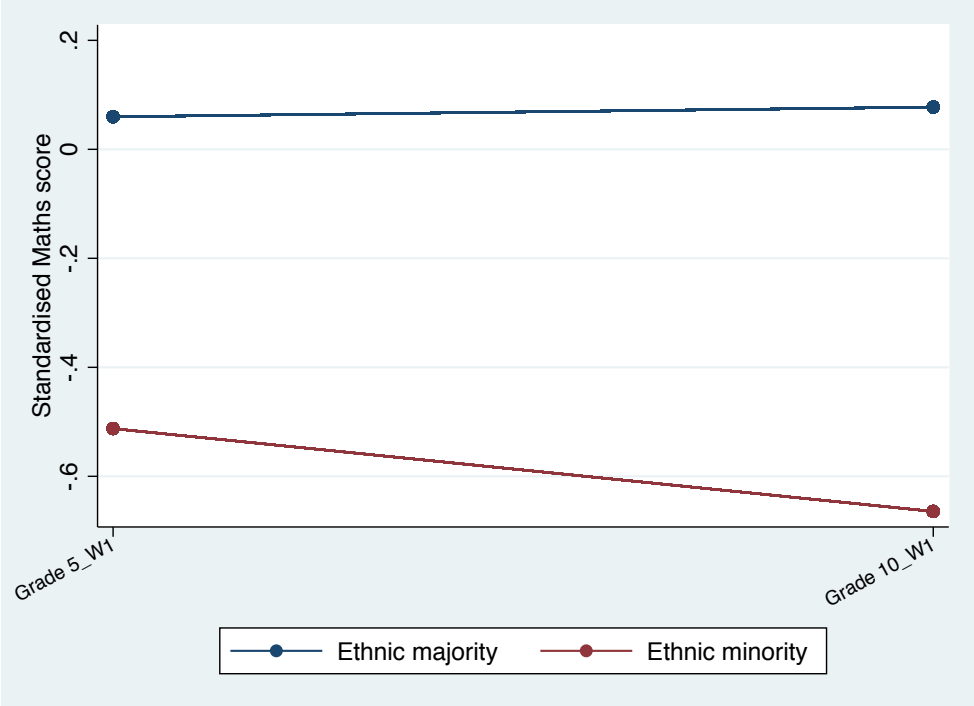
Figure 2: Maths scores by wealth tercile, 2011 & 2016



When examining the Maths scores of the same students in Grade 10, there is apparently little change in the gaps by wealth as measured five years earlier (Figure 2). While there are some limitations to comparing based on standardised measures from two somewhat different tests, the lack of evidence for a worsening of inequality may be considered a positive finding to the extent that there is little to suggest a regressive effect of the lower secondary education system specifically. Alternatively, we observe that there is equally little evidence that the gaps that had arisen before and during primary schooling have been reduced.

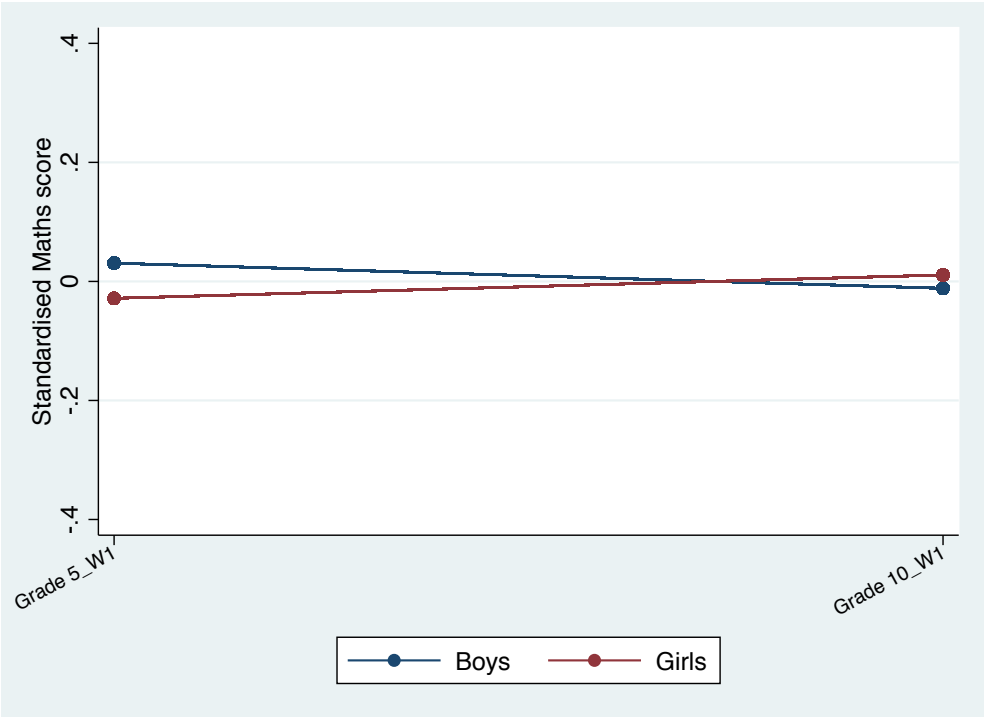
[8] The Maths tests administered in Grade 5 and Grade 10 included four common items; however, this is not sufficient to link the tests on a common scale. Instead, test scores presented in this sub-section have been standardised to have a mean of 0 and standard deviation of 1.

Figure 3: Maths scores by ethnic status, 2011 & 2016



By contrast, when looking at learning trajectories of ethnic majority and minority students, it does appear that the gap in learning outcomes has widened over time, from approximately 0.6 standard deviations in Grade 5 to 0.8 standard deviations in Grade 10 (Figure 3). This is particularly notable since analysis from Rolleston et al (2013) found that gaps between ethnic majority and minority students narrowed over the course of Grade 5, suggesting that during this year of primary schooling ethnic minority children did 'catch up' on the curriculum content specific to Grade 5 expectations. However, this trends do not seem to be continued over a longer period of schooling, with inequalities in learning outcomes between ethnic majority and minority students seeming to worsen by the start of Grade 10, when measured by performance on content relevant to Grade 10 expectations.

Figure 4: Maths scores by gender, 2011 & 2016



Examining learning outcomes by gender, there is very little difference in girls' and boys' performance in Grade 5, and by Grade 10, there is almost no difference at all (Figure 4). As discussed above, boys may be less likely to transition to upper secondary school, but for those who do make it to Grade 10, there are no significant gender inequalities in learning outcomes.

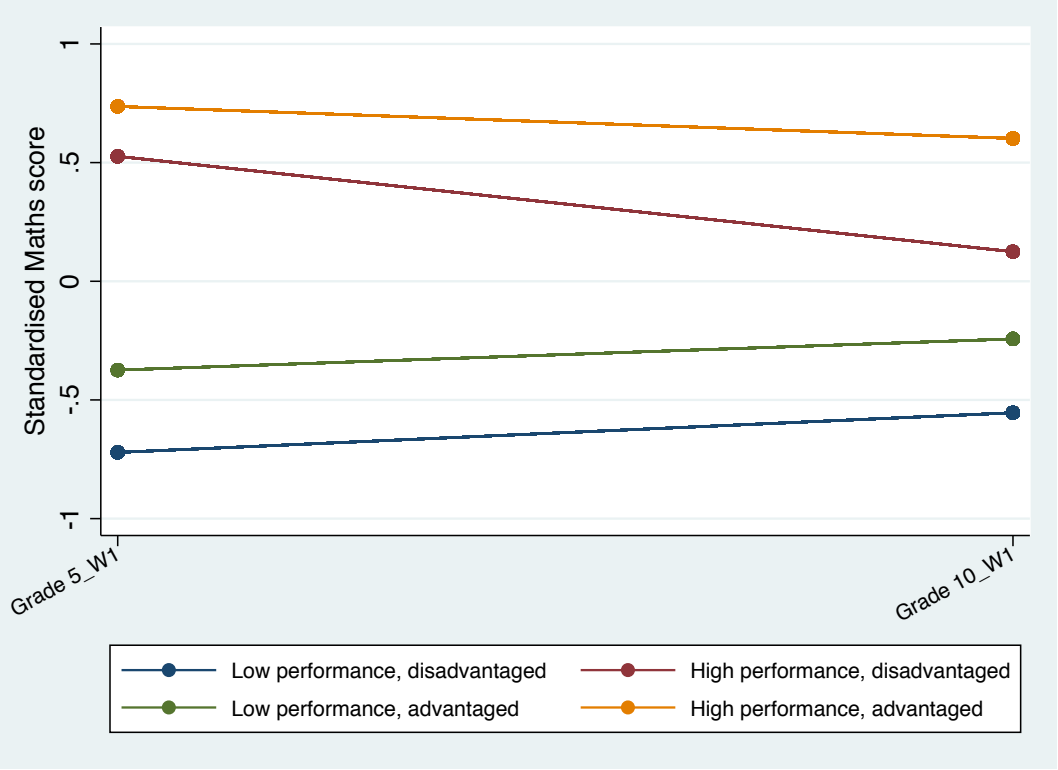
5. Student performance and equity from primary to upper secondary

It is hardly unusual to find that students from more advantaged groups are performing better educationally in any context, but there is greater debate about when gaps emerge and develop. While an education system cannot 'correct' all the inequalities of wider society, a system focused on equitable progress will set out to ensure that educational merit or potential is a key determinant of learning outcomes, separated as far as possible from economic circumstances. In order to examine the equity of progress, so construed, we group student by both educational performance[9] and household wealth in Grade 5 as follows (Figure 5):

- High performance, advantaged: top performance tercile, top wealth tercile (Group 1)
- High performance, disadvantaged: top performance tercile, bottom wealth tercile (Group 2)
- Low performance, advantaged: bottom performance tercile, top wealth tercile (Group 3)
- Low performance, disadvantaged: bottom performance tercile, bottom wealth tercile (Group 4)

In Grade 5, while there is a clear gap in learning outcomes between high and low performance groups, the gaps between students of the same performance but different home advantage (Groups 1 and 2, Groups 3 and 4) are relatively small – around 0.25 standard deviations in both cases.

Figure 5: Maths scores by advantage and performance groups, 2011-2016

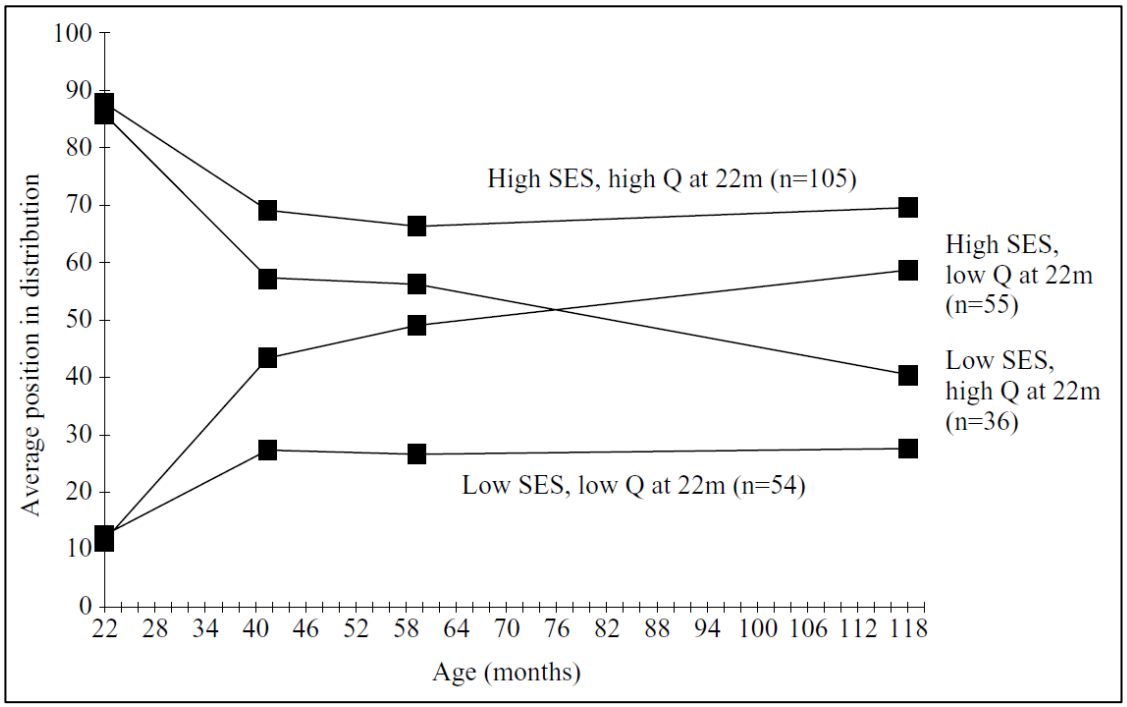


[9] Wealth index in Grade 5 was used as the indicator of household wealth, while 'school performance' is estimated using the part of the student's Maths score that is correlated with the Vietnamese score. We follow this approach to mitigate problems of measurement error due to 'guessing' on multiple choice tests and also because using a single test to define a 'high ability' group can lead to a significant proportion of individuals being misclassified – see Jerrim & Vignoles (2011).

By Grade 10, the gap in learning outcomes between Groups 3 and 4 is unchanged, while the gap between Groups 1 and 2 has increased to almost 0.75 standard deviations. While home disadvantage does not appear to 'worsen' the performance of lower scoring students over time compared to their more advantaged counterparts, high performing students from poorer households do fall considerably further behind their counterparts from richer households over the same period. Nonetheless, the four groups are still ranked in the same order by Grade 10. This may be compared to an analysis of UK data in an influential paper by Feinstein (2003), which used 1970 birth cohort data from the UK on cognitive development assessed at ages 22 months, 42 months, five years and ten years. Feinstein (2003) reported that children from advantaged backgrounds who scored poorly in early tests had a tendency to 'catch up'. By contrast, children from disadvantaged backgrounds who scored poorly early on were extremely unlikely to catch up, and entry into schooling did not reverse this pattern. As shown in Figure 6, advantaged children were much more likely to be in the top performance quartile than the lowest by age 10, even if they were in the bottom performance quartile at 22 months (Feinstein 2003).

Feinstein's findings, and the claim that his analysis indicated 'the extent to which the formation of human capital is influenced by family background' in the UK (2003: 89), played an important role in shaping government policy of major pre-school educational interventions in the 2000s (Bynner et al 2015). The findings have not been uncontroversial; in particular, Jerrim & Vignoles (2011) challenged the existence of the crossover as an effect of 'regression to the mean' (see also Bynner et al 2015). However, Feinstein's (2003) analysis does provide an example of what an inequitable education system would look like – one in which wealthier children outperform poorer children regardless of their initial performance or ability levels. By comparison, based on the analysis presented in Figure 5, the Vietnamese education system appears relatively equitable – one in which high performing, disadvantaged students continue to achieve relatively high learning outcomes over time.

Figure 6: Average rank of test scores at 22, 42, 60 and 120 months, by socio-economic status of parents and early rank position, British 1970 Cohort



Source: (Feinstein 2003: 85)

6. Discussion and Conclusions

As one among several Southeast Asian countries seeking to avoid a 'middle income trap', ensuring access to quality upper secondary education is of increasing importance for Vietnam (Pereira 2016; World Bank 2011). This paper has drawn on unique Young Lives household and school survey data to answer key questions about access and equity in upper secondary education in Vietnam, namely: (1) the characteristics of children who make the transition to Grade 10; (2) the factors associated with learning outcomes in Grade 10; and (3) the patterns of inequality and inequity in access and learning outcomes in Grade 10.

Young Lives school survey data provide a unique opportunity to analyse trends in learning outcomes over time, since they include data collected in the last year of primary school (Grade 5) and the first year of upper secondary school (Grade 10). We find that prior performance is strongly associated with progression to Grade 10, and Grade 5 performance is strongly associated with higher Maths scores at the beginning of Grade 10, which indicates somewhat 'meritocratic' progression. Our findings demonstrate a 'reverse gender gap' in access to upper secondary education – i.e., girls being more likely than boys to progress to Grade 10. This is consistent with findings from Dang & Glewwe (2017), and may be linked to expectations that adolescent boys participate in the labour market rather than going to school (Zharkevich et al 2016). Conditional on entry to upper secondary school, however, we find no gender gap in attainment.

Performance in Grade 5 tests represents both ability and advantage, and it is important that policies concerning progression through education take account not only of realised learning levels but also of potential, adjusted for 'opportunities to learn' which are affected by factors including home backgrounds and earlier school quality. Moreover, even when we condition on earlier performance, we find additional effects of household wealth and educational support and preferences (as represented by main caregiver's education) for both progression and achievement. This suggests continuing influences of home advantage across the educational life course, leading to persistent inequities. These findings on the importance of wealth and educational preference are consistent with those reported by Dang & Glewwe (2017), but the importance of student prior performance on transition to upper secondary school in Vietnam has not, to our knowledge, been estimated elsewhere.

Analysis of Young Lives household data points to substantial inequities in access to upper secondary education. Most obviously, while 80.84% of ethnic majority children in the Young Lives Younger Cohort progressed to Grade 10, this figure was only 48.93% of ethnic minority children. These proportions are comparable to those reported nationally (79% and 50% respectively; see Dang & Glewwe 2017), in spite of the pro-poor characteristics of the Young Lives sample. Mitigation of such inequities may require specific policies. While ethnic minority status is not a significant predictor when controls are included, it is clear that 'exclusion' of ethnic minorities operates through indirect mechanisms, most obviously their lower average test scores, plus lower average household wealth and mother's education.

When examining trends over time, the gap between ethnic majority and minority students' learning outcomes has widened between Grade 5 and Grade 10. This suggests that the ability of ethnic minority students to 'catch up' over the course of Grade 5 (Rolleston et al 2013) is not extended over a longer period of schooling. In turn, this has the effect that ethnic minority students develop Maths skills to a lesser extent than their Kinh counterparts, affecting their performance in entrance examinations which govern entry to Grade 10. Since the Grade 10 entrance examination marks a key threshold which rations access to higher levels of education and, ultimately, to many highly skilled and well-paid occupations, the longer term equity effects of inequitable access may be much more substantial than those we are able to detect with the present data. Forthcoming analysis, using Maths test scores from the same students at the end of Grade 10, will indicate whether 'catch up' (or otherwise) is found among ethnic minority students within Grade 10.

While our findings do not point directly towards specific discrimination in the system with regard to ethnic minority students, they do suggest that further 'compensatory policies' intended to improve access for minorities may be desirable. Equally, our analysis suggests that ethnic majority students with disadvantaged backgrounds would benefit from such policies. Policies of this kind are already in place in some localities, such as the provision of ethnic minority boarding schools in remote areas of Lao Cai province, which are intended to address both supply and demand barriers for the least advantaged students. Nonetheless, further interventions may be required both to ensure disadvantaged students can access upper secondary school based on academic potential (which may require 'positive discrimination' with respect to examination scores used as entry criteria), and that they are not excluded based on 'ability to pay'. The latter issue may require additional policies to ensure fee exemptions or subsidies or conditional cash transfer schemes to offset opportunity costs of schooling in the most disadvantaged areas.

Overall, our findings indicate that there are inequities in access and learning outcomes at upper secondary level in Vietnam, with notable gaps between ethnic minority and majority students in terms of access and attainment. However, looking at learning trajectories over time in Vietnam, high performing, disadvantaged children continue to achieve high learning outcomes form primary to upper secondary school; in an education system in which inequities are more entrenched, we might expect wealthier children to outperform poorer children over time regardless of their ability levels (e.g. Feinstein 2003). These indications of relative equity across the basic and post-basic education systems in Vietnam appear to be an encouraging starting point for the country's ambitions to skill up its young people for a twenty-first century economy.

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Appendix 1

Summary statistics for variables used in analysis: access to Grade 10 (Younger Cohort sample)

VARIABLES	Description	Obs.	Mean	Std. Dev.	Min.	Max.
wi4	Wealth index, 2013	1,919	.6123075	.1338824	.0509259	.9018518
R4mat_theta	Maths score, 2013	1,855	-.0014359	.9348513	-2.568651	2.662963
sex	Female	1,970	.4862944	.499939	0	1
ethnic	Ethnic minority	1,970	0.14264	.3497937	0	1
careedu_bin	Main caregiver's education (6 years or more)	1,949	.6233966	.4846584	0	1
typesite4	Rural location	1,843	0.806294	.3953084	0	1

Appendix 2

Summary statistics for variables used in analysis: learning outcomes in Grade 10 (Young Lives Grade 5 & Grade 10 school survey sample)

VARIABLES	Description	Obs.	Mean	Std. Dev.	Min.	Max.
G5irt_mat1	Grade 5 W1 Maths score (scaled IRT)	1,054	475.2543	95.38383	191.9541	739.8954
G5irt_vn1	Grade 5 W1 Vietnamese score (scaled IRT)	1,060	487.3261	98.27785	118.6718	708.1796
VA_g5	School Value-Added, Grade 5	1,060	7.337083	35.05972	-114.2103	103.2559
gender	Student's gender	1,060	0.518868	.4998797	0	1
age	Student's age	1,057	15.23746	.4474215	15	18
ethn2	Ethnic minority	1,060	.1037736	.3051106	0	1
wi_g5	Wealth index, Grade 5 (2011)	1,060	-.0066524	1.555841	-6.196282	4.589747
healthprob	Any health problems (reported in Grade 5)	1,060	.2330189	.4229537	0	1
studplac	Own place to study at home (reported in Grade 5)	1,054	.829222	.3764935	0	1
repgrade	Ever repeated any grades at school (reported in Grade 5)	1,059	.02644	.1605157	0	1
mom_educ2	Mother's education	1,057	Takes values 1 – 3 for primary to higher education			
vthome	Vietnamese spoken at home (reported in Grade 5)	1,058	Takes values 0 – 2 for never to always			
nummeal	Number of meals eaten per day (reported in Grade 5)	1,057	Takes values 1 – 3 for number of meals			
numbook	Number of books in the home (reported in Grade 5)	1,054	Takes values 0 – 3 for 0 to more than 10 books			
province	Province	1,060	Takes values 1 – 5 for each province			

Appendix 3

Maths scores at age 12 (2013) by child characteristics and family background

VARIABLES	Mean	Std. Dev.	Freq.
Gender			
Boys	494.83	99.91	955
Girls	505.17	99.79	900
Ethnic status			
Ethnic majority	511.28	95.81	1,612
Ethnic minority	423.97	93.73	243
Main caregiver's education			
0 – 5 years	456.35	87.21	671
6 or more years	524.82	98.20	1,163
Household wealth, 2013			
Top tercile	534.61	100.24	555
Middle tercile	508.27	92.05	616
Bottom tercile	458.73	95.06	571