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Background paper prepared for the
Education for All Global Monitoring Report 2013/4

Teaching and learning: Achieving quality for all

Exploring the effect of educational opportunity and inequality on learning outcomes in Ethiopia, Peru, India, and Vietnam

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1. Introduction

The provision of access to good quality education *for all* requires not only improvements in access and quality, but improvements in the way access and quality are distributed between more and less advantaged groups. Longitudinal data from the Young Lives study in Ethiopia, Peru, India (in the state of Andhra Pradesh) and Vietnam offer a unique opportunity to explore these issues in comparative perspective. In this paper we examine trends in enrolment and learning across two cohorts of children, born in 1994/5 and 2001/2, comparing children by gender, household wealth and residence in urban and rural locations. We examine both learning levels and changes over time; taking account of prior learning in order to understand both the cumulative effects of background disadvantage and school quality and the effects on learning progress during particular time periods spent in school. Further, we explore the potential impact of school quality and 'opportunities to learn' in mediating the relationships between disadvantage and learning outcomes through two comparative analyses – a comparison between India and Vietnam on children's progress in relation to curricular expectations and a comparison between Vietnam and Peru on the effects of differences in school quality on learning attainment.

2. Country contexts

Improving educational access, quality and equity are high among political priorities in all four Young Lives countries. Vietnam adopted its 'Law on Universal Primary Education' in 1991, making basic education compulsory and had practically achieved the target of universal access by 2010, with the Net Enrolment Rate (NER) reaching 98% and over-age enrolment being below 7% (World Bank, 2013). Peru's 2003 'General Education Law' also provided for compulsory basic education and there have been considerable increases in enrolment at primary schools in recent years. As in Vietnam, enrolment was almost universal by 2010 at 95% (World Bank, 2013). The Indian state of Andhra Pradesh demonstrates a similarly high enrolment rate, with ASER (2013) estimating that only 2.61% of children age 6-14 are out of school. Enrolment in Ethiopia is lower, at 86% in 2011, but this should be seen in the context of substantial expansion in recent years – from a NER of just 44% in 2001 (World Bank, 2013). The introduction of mass basic schooling in Ethiopia is therefore still relatively young, compared to the other Young Lives study countries.

All four Young Lives study countries have experienced substantial economic growth since the Millennium, and all but Ethiopia had graduated to middle-income status by 2011. Table 1 shows key economic, educational and demographic indicators for the four countries. The ability to improve education quality through increased per-pupil resourcing depends not only on economic growth and increased political willingness to fund education, but also upon the size and rate of growth of the school-age population. In Vietnam, low population growth and a large reduction in the size of the youth population during the period covered by the Young Lives surveys have no doubt enabled education quality improvements, and the challenges of improving both quality and equity have been addressed robustly. For example, recent policies and programmes have set out to improve primary school facilities, teacher training, curricula and textbooks, as well as to increase the number of hours of formal instruction, which still

remain among the lowest in Asia. In particular, programmes intended to ensure 'minimum standards' of quality, especially in disadvantaged areas, have been implemented, notably in the guises of SEQAP (School Education Quality Assurance Program) and PEDC (Primary Education in Disadvantaged Communes) (see World Bank 2004). Policies emphasise the principle of 'socialisation' (*Xã hội hóa)* according to which communities are expected to share in the costs of education, but with extra support being provided for poor districts. Despite relatively high overall standards, 'learning gaps' also remain a major concern in Vietnam, along lines of ethnicity and remote/rural location (Le Thuc Duc et al., 2008; Rolleston et al, 2013; World Bank, 2011).

Youth populations are shrinking in proportionate terms in the other three countries, although at a slower rate, while per-pupil expenditure has improved in all, most notably in Peru. Nonetheless, learning standards in comparative terms remain relatively low in Peru, and are among the lowest in Latin America (World Bank 2007). Further, standards differ widely between socio-economic groups, making inequality a central concern (Cueto, 2007). Since the rapid expansion of schooling across India, related in part to reforms and programs such as the District Primary Education Project' (DPEP) and *Sarva Shiksha Abhiyan* (SSA), significant progress has been made toward universal access, and the 2009 Right to Education Act (RTE) has enshrined in law the right of children to a free and compulsory education (Little, 2010). A crisis of quality remains, however. Recent reports from ASER in India have shown stagnation, or even decline, in learning levels, including in Andhra Pradesh (ASER, 2013), while increasing numbers of pupils are exiting the state-sector in preference for relatively low-fee private providers (Woodhead et al., 2013). The RTE has to an extent recognised this 'crisis of confidence' by codifying expected standards of quality and by requiring private schools to admit disadvantaged pupils. Nonetheless, issues such as poor learning, teacher absenteeism and low rates of school completion are pervasive (Kingdon, 2007).

The government of Ethiopia introduced the 'General Education Quality Improvement Programme' (GEQIP) in 2010, with the aim of facilitating improvements in the quality of schooling nationally, focusing on equity and learning outcomes through investment in key inputs such as textbooks and infrastructure. Significant challenges remain, including those concerning access in rural and remote communities and the participation of girls and of those from disadvantaged backgrounds, especially children in pastoralist regions (MOE, 2008). Poverty-related disadvantage is arguably the key driver of low educational indicators such as high levels of delayed enrolment and drop-out, in this low-income and predominantly rural context. However, recent successes in widening access and enrolment are also likely to have exerted downward pressure on learning indicators as influxes of relatively disadvantaged pupils have entered the system (Dom, 2010).

In summary, among Young Lives study countries, the challenge of providing basic access for all remains substantial only in Ethiopia, where resources remain low and population growth relatively high. As we demonstrate in the sections that follow, the key challenge in India lies arguably in raising learning levels for the majority of pupils, while in Peru and to a lesser

extent in Vietnam, improvements in the distribution of quality schooling are likely central for policy aimed at improving learning overall.

Table 1: Economic, Demographic and Educational Indicators by Country

	Ethiopia	Peru	India	Vietnam
Economic growth rate (GDP 2001-09)	8.32	5.36	7.22	7.31
Population growth rate (2001-2009)	2.37	1.19	1.51	1.17
Usual age of enrolment	7	6	5	6
Youth population (age 0-14) 2001 (%)	46	34	34	31
Youth population (age 0-14) 2009 (%)	42	30	31	24
Per pupil expenditure (primary) 2001[1] (USD)	26.8	141.9	62.1	N/A
Per pupil expenditure (primary) 2009[2] (USD)	58.24	405.90	73.80	207.58

Source: World Bank (2013)

3. Data and Methods

The analyses in this paper build on a unique data set comprising both household surveys as well as school surveys, including extensive school history and educational achievement data. Young Lives has gathered longitudinal data at the household and child-level since 2002, regularly following up a sample of 12,000 index children in Ethiopia, India (Andhra Pradesh), Peru and Vietnam. Within each country the sample includes an 'older cohort' of approximately 1,000 children born in 1994-5 and a 'younger cohort' of approximately 2,000 children born in 2000-01. Achievement data from individually administered child tests carried out as part of the household surveys are available for both cohorts of children, including those attending and not attending school. Two key features of longitudinal household survey provide for analyses which are not possible using simple cross-sectional surveys. Firstly, the longitudinal design makes possible the construction of the educational trajectories or learning profiles of pupils. Secondly, the availability of data on two cohorts of children allows for comparison between equivalent groups over a seven year period that has been characterised by notable economic and educational change.

The sample of index children in the Young Lives study in each country is clustered in twenty 'sentinel sites', purposively selected to represent the diversity of each country, with a pro-poor focus. At each site, one hundred older-cohort and two-hundred younger cohort children were selected at random after enumerating all households containing a child of the required age. Extensive data has been collected in three rounds to date – in 2002, 2006-7 and 2009,

[1] Ethiopia data are for 1997

[2] Ethiopia data are for 2010, India data are for 2006, and Vietnam data are for 2008. This was calculated using GDP per capita and the expenditure per student at the primary level as a % of GDP per capita.

when the older cohort of children were aged 8, 12 and 15 respectively and the younger cohort were aged 1, 5 and 8 respectively.

School surveys were introduced into the Young Lives design between 2010 and 2013, in order to enrich the educational data from household surveys, with much more comprehensive data about the schools attended by Young Lives children and their peers, including learning resources, teacher competencies and educational achievement. These surveys have followed slightly different designs in each country in order to reflect differences in schooling systems and policy and research priorities, but in each case provide data to enable analysis of children's learning progress and its determinants. Children's attainment is measured in the school surveys using assessments in mathematics and reading comprehension, primarily using multiple-choice items to reflect key areas of the curriculum[3]. Accordingly, these do not allow direct comparison of scores between countries.

4. School Enrolment

Table 2 reports the levels of school enrolment of the study children for each country, by age and cohort and by household wealth quintile, sex and location of residence. Enrolment at age 5 (in 2006) is negligibly low in Ethiopia, Peru and Vietnam, where the school entry ages are 7, 6 and 6 respectively, while two-fifths of pupils had begun school in India (where the official grade 1 entry age is 5). By age 8 more than 90% of pupils were in school in both cohorts, except in Ethiopia, although enrolment of this age group improved in that country from 66% to 72% between cohorts. While the vast majority of pupils in all countries were in school at age 12 (older cohort in 2006), rates had declined by age 15 three years later, especially in Vietnam, due to drop-out and to pupils completing the basic education cycle (and not progressing further). Enrolment gaps between urban and rural areas and between high and low wealth households are notable at age 8 and 15 in Ethiopia; at age 8 many disadvantaged pupils had yet to enrol and at age 15 a number had dropped-out. In India, more advantaged pupils were more likely to enrol early (at age 5), and were less likely to have left school at ages 12 and 15; a tendency mirrored in Vietnam at age 15. Differences between the sexes overall are small, more often, but not exclusively favouring boys. When examined in relation to the top and bottom wealth quintiles, there is some evidence of earlier drop-out (by age 15) among poor girls in India and among poor boys in Peru, Ethiopia and Vietnam, with the lowest rate of enrolment at age 15 being for poor boys in Vietnam, raising concerns over equity of access in terms of gender. Table 3 reports the absolute number of children out of school for each age-group and cohort.

Figure 1 illustrates the enrolment data for Ethiopia, where access levels are lowest. At age 8, enrolment improved between cohorts for the poorest groups, but not for the least poor and the gap between the two groups narrowed notably. Poorer children were as likely as the least

[3] School test data were subjected to item-response analysis using a three-parameter model to recover estimates of the underlying or latent ability trait in each subject on an interval scale, accounting for item-difficulty and discrimination and for guessing where multiple-choice items are concerned. The scores are re-scaled to have a mean of 500 and a standard deviation of 100 for ease of interpretation.

poor to be enrolled at age 12, but typically had enrolled later and went on to drop-out earlier, thereby receiving fewer years of schooling.

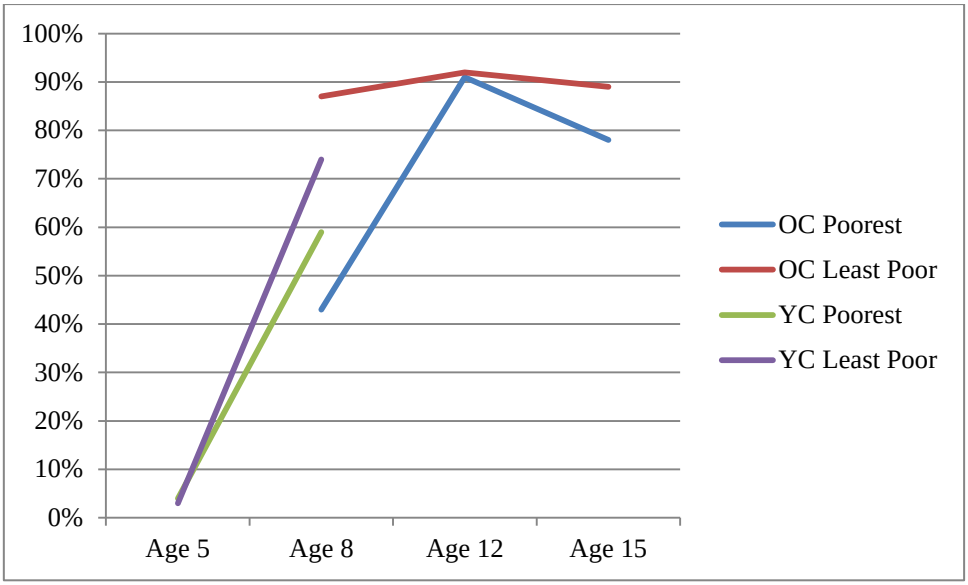
Table 2: Proportions of Children Enrolled in School by Cohort, Age and Background

Country	Cohort/ Round	Total	Girls	Boys	WQ1	WQ4	Rural	Urban	WQ1 Girls	WQ1 Boys	WQ 4 Girls	WQ 4 Boys
Ethiopia	Age 5 YC	0.04	0.03	0.04	0.04	0.03	0.04	0.03	0.03	0.05	0.02	0.04
	Age 8 YC	0.72	0.72	0.71	0.59	0.74	0.65	0.85	0.60	0.59	0.73	0.75
	Age 8 OC	0.66	0.68	0.63	0.43	0.87	0.51	0.92	0.41	0.45	0.90	0.84
	Age 12 OC	0.93	0.93	0.92	0.91	0.92	0.91	0.96	0.91	0.91	0.91	0.93
	Age 15 OC	0.87	0.89	0.85	0.78	0.89	0.84	0.93	0.82	0.73	0.92	0.87
Peru	Age 5 YC	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
	Age 8 YC	0.93	0.93	0.94	0.95	0.86	0.93	0.93	0.96	0.95	0.84	0.88
	Age 8 OC	0.99	0.99	0.99	0.95	1	0.98	0.99	0.97	0.94	1.00	0.99
	Age 12 OC	0.95	0.96	0.94	0.97	0.87	0.95	0.95	0.97	0.97	0.89	0.86
	Age 15 OC	0.88	0.91	0.85	0.8	0.87	0.83	0.89	0.84	0.77	0.90	0.84
India	Age 5 YC	0.43	0.45	0.42	0.46	0.33	0.48	0.31	0.48	0.45	0.34	0.32
	Age 8 YC	0.93	0.94	0.91	0.94	0.87	0.93	0.90	0.95	0.92	0.88	0.86
	Age 8 OC	0.97	0.97	0.98	0.96	0.97	0.97	0.98	0.95	0.98	0.97	0.98
	Age 12 OC	0.88	0.87	0.89	0.81	0.93	0.87	0.92	0.82	0.81	0.92	0.93
	Age 15 OC	0.75	0.72	0.78	0.69	0.84	0.73	0.82	0.65	0.73	0.86	0.83
Vietnam	Age 5 YC	0.00	0.01	0.00	0.00	0.01	0.01	0.00	0.01	0.01	0.01	0.01
	Age 8 YC	0.96	0.96	0.96	0.94	0.94	0.96	0.96	0.95	0.93	0.93	0.94
	Age 8 OC	0.99	0.98	0.99	0.94	1	0.98	1	0.92	0.95	1.00	1.00
	Age 12 OC	0.96	0.96	0.95	0.90	0.96	0.95	0.98	0.89	0.90	0.98	0.94
	Age 15 OC	0.73	0.78	0.69	0.58	0.87	0.71	0.83	0.66	0.50	0.92	0.83

Table 3: Numbers of children out of school by age and cohort

	Ethiopia		**India**		**Peru**		**Vietnam**	
	YC	OC	YC	OC	YC	OC	YC	OC
Age 5	1928	-	1137	-	471	-	1991	-
Age 8	563	344	150	26	135	7	79	15
Age 12	-	75	-	123	-	36	-	43
Age 15	-	128	-	254	-	87	-	267

Figure 1: School Enrolment by Cohort, Age and Household Wealth in Ethiopia



5. Learning Levels

Table 4 below summarises the tests administered in the Young Lives household surveys. Tests in basic reading, writing, numeracy, understanding of quantity and mathematics are translated versions of identical tests in each country and as such are broadly comparable between countries. Since different content is required at different ages, assessments in maths do not use the same tests at ages 8, 12 and 15, so that simple comparisons over time are not informative. The tests are designed to cover country- and age-appropriate mathematical skills, allowing an understanding of the extent to which such skills develop over time. The basic reading, writing and numeracy tests are identical at each survey round, allowing comparisons over time. The PPVT (Peabody Picture Vocabulary Test) contains a bank of vocabulary items (in difficulty-ordered sets) in relation to which pupils are asked to identify a picture denoting the item, selected from a choice of four alternatives. While the test results cannot be compared between countries, owing to their language dependence, the results can be compared over time within countries, since the test administered at different ages is the same and covers a wide range of vocabulary items, allowing pupils to continue to make progress at later ages.

Table 4: Young Lives Household Survey Tests in Numeracy and Literacy

Test	Domain	Description of Test	Data	Cohort	Round	Age
Basic Reading	Reading	Asked to read single letters, words and a simple sentence	Categorical variable: No reading Can read letters Can read words Can read sentences	OC OC YC YC	1 2 2 3	7-8 11-12 4-5 7-8
Basic Writing	Writing	Asked to write a sentence	Categorical variable: No writing Writes with difficulty Writes without difficulty	OC OC YC YC	1 2 2 3	7-8 11-12 4-5 7-8
Basic Numeracy	Maths	Children asked to respond to a single item (2x4)	Categorical variable: Correct Incorrect	OC OC YC YC	1 2 2 3	7-8 11-12 4-5 7-8
PPVT (Peabody Picture Vocabulary Test)	Vocab	Test of receptive vocabulary (used as a proxy for cognitive development/school readiness)	Raw response scale (number of pictures identified correctly as illustrating appropriate words)	OC OC YC YC	2 3 2 3	11-12 14-15 4-5 7-8
CDA-Q (Cognitive Development Assessment (Quantity)	Understanding of quantity	Test of basic understanding of concepts of quantity and number (10 items)	% correct responses	YC	2	4-5
Maths	Maths	10 question maths test (age-linked)	% correct responses	OC	2	11-12
Maths	Maths	30 question maths test (age-linked)	% correct responses	OC	3	14-15
Maths	Maths	30 question maths test (age-linked)	% correct responses	YC	3	7-8

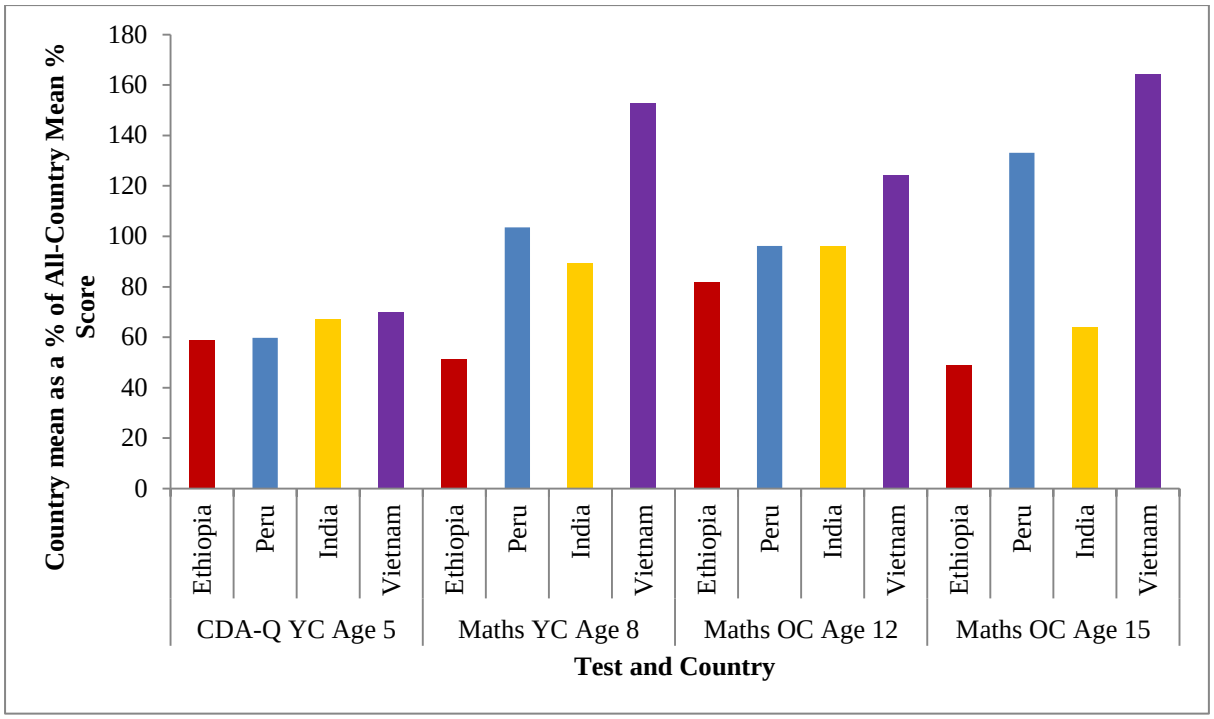
The proportions of children who had mastered basic skills in reading, writing and numeracy at age 8 are compared across cohorts (in 2001/2 and 2009) in Table 5. Stark differences in skill mastery are found between countries. The vast majority of children in Vietnam had mastered all three basic skills at age 8 in both cohorts, while only a minority of children in Ethiopia had done so, with a more mixed picture emerging in India and Peru. The difference in expected age of enrolment in primary school favouring India draws particular attention to the gap in literacy skills between India and Vietnam. Despite an increase in enrolment in schools in Ethiopia, the percentage of children able to read, write or correctly answer a simple maths question did not increase notably between the cohorts, nor is a pattern of significant change observed in the other countries. Gaps in basic skills between pupils who are enrolled in school and those who are not are large, while differences between the sexes are mostly small. Partly reflecting differences in enrolment, but also differences in school quality and backgrounds, there are typically large gaps in basic skills between pupils in the most and least poor households and those in urban and rural areas, while these gaps are notably smaller in Vietnam, suggesting more equitable delivery of basic-skills learning in the first two years of schooling.

Table 5: Proportions of Pupils Mastering Basic Literacy and Numeracy at Age 8

Country		Competency	Total	Girls	Boys	WQ1	WQ4	Rural	Urban	Enrolled	Not enrolled
Ethiopia	OC age 8	read sentences	0.21	0.22	0.20	0.11	0.42	0.08	0.45	0.32	0.01
		writes without difficulty	0.20	0.17	0.22	0.12	0.31	0.15	0.28	0.27	0.06
		answers 2x4 correctly	0.44	0.39	0.47	0.36	0.56	0.38	0.51	0.52	0.13
	YC age 8	read sentences	0.25	0.26	0.25	0.07	0.45	0.10	0.53	0.34	0.02
		writes without difficulty	0.16	0.17	0.16	0.04	0.34	0.06	0.36	0.22	0.01
		answers 2x4 correctly	0.46	0.46	0.46	0.32	0.68	0.34	0.68	0.50	0.30
Peru	OC age 8	read sentences	0.80	0.80	0.80	0.59	0.91	0.63	0.85	0.80	0.14
		writes without difficulty	0.32	0.30	0.33	0.39	0.26	0.42	0.28	0.32	0.14
		answers 2x4 correctly	0.75	0.73	0.76	0.56	0.88	0.62	0.78	0.75	0.00
	YC age 8	read sentences	0.77	0.76	0.77	0.58	0.81	0.63	0.84	0.82	0.01
		writes without difficulty	0.58	0.59	0.57	0.35	0.69	0.41	0.67	0.62	0.01
		answers 2x4 correctly	0.73	0.72	0.73	0.54	0.87	0.58	0.79	0.73	0.50
India	OC age 8	read sentences	0.51	0.47	0.55	0.40	0.70	0.46	0.66	0.51	0.35
		writes without difficulty	0.27	0.22	0.33	0.31	0.16	0.31	0.17	0.28	0.08
		answers 2x4 correctly	0.90	0.88	0.92	0.82	0.96	0.89	0.94	0.91	0.74
	YC age 8	read sentences	0.50	0.53	0.48	0.35	0.64	0.47	0.59	0.54	0.09
		writes without difficulty	0.41	0.42	0.40	0.26	0.59	0.37	0.55	0.43	0.13
		answers 2x4 correctly	0.89	0.90	0.87	0.85	0.90	0.89	0.87	0.89	0.66
Vietnam	OC age 8	read sentences	0.87	0.88	0.86	0.67	0.98	0.85	0.95	0.88	0.07
		writes without difficulty	0.17	0.15	0.19	0.16	0.09	0.18	0.12	0.17	0.00
		answers 2x4 correctly	0.86	0.87	0.85	0.83	0.93	0.84	0.92	0.86	1.00
	YC age 8	read sentences	0.87	0.88	0.86	0.76	0.92	0.85	0.94	0.90	0.11
		writes without difficulty	0.85	0.88	0.82	0.68	0.91	0.83	0.93	0.88	0.13
		answers 2x4 correctly	0.91	0.90	0.92	0.83	0.97	0.89	0.98	0.91	0.85

Figure 2 presents the average test results of the CDA-Q and maths assessments administered to the younger cohort children in Rounds 2 and 3 respectively in each country as a percentage of the mean for the cross-country sample. Differences on the CDA-Q, administered before most children began schooling, are small. At age 8, Vietnamese children perform much better and Ethiopian children much less well than average in maths, with Vietnamese pupils' scores being around three times higher and with India and Peru lying closer to the all-country average. At age 12, when almost all children were in school, the pattern is similar but notably less stark, suggesting that schooling across study countries enables a degree of 'catch-up' between children from different groups, reducing inequality in learning outcomes across contexts. By age 15, however, the gap between Vietnamese and Ethiopian pupils is even greater, while Peruvian pupils perform above average and those in India only slightly better than in Ethiopia, despite their earlier performance having been much better than that of pupils in Ethiopia. This finding suggests that learning in the India sample 'keeps pace' less well as the demands of the age-based tests increase, as we explore in section 7.

Figure 2: Maths and CDA-Q Scores by Country and Age (as % of Overall Mean)



It is clear that the the largest differences in learning are most often between countries and national education systems. On average, the smallest differences can be found at age 5, when most pupils have not begun school and at age 12 , when most children are in school. By contrast, differences across countries are most pronounced when there is variation in enrolment (age 8 and 15) and when the demands of the tests are greatest (age 15). Nonetheless, these cross-country comparisons mask within countries variation: as compared to their more advantaged peers in the same country, disadvantaged pupils' learning is considerably falling behind. The differences in performance by wealth and residence at age 8 are illustrated in Figure 3, which shows the largest relative gaps by wealth and residence are found in Ethiopia and Peru.

Enrolment in school may be expected to play an important role in learning development, especially in maths. Figure 4 presents the maths scores of pupils at age 15 by their enrolment histories and, not surprisingly, illustrates a strong association between longer exposure to schooling and maths learning. Pupils who were enrolled at all rounds of the survey achieve scores which are dramatically higher than those who had enrolled late or dropped out, or especially when compared to those who had never enrolled. The poor performance of pupils with various patterns of non-continuous enrolment in Ethiopia and of early drop-outs more generally is especially notable, while in some cases poor performance may of course be a pre-cursor to drop-out, as we examine in Table 6.

Figure 3: Maths Scores at Age 8 by Country, Household Wealth and Residence

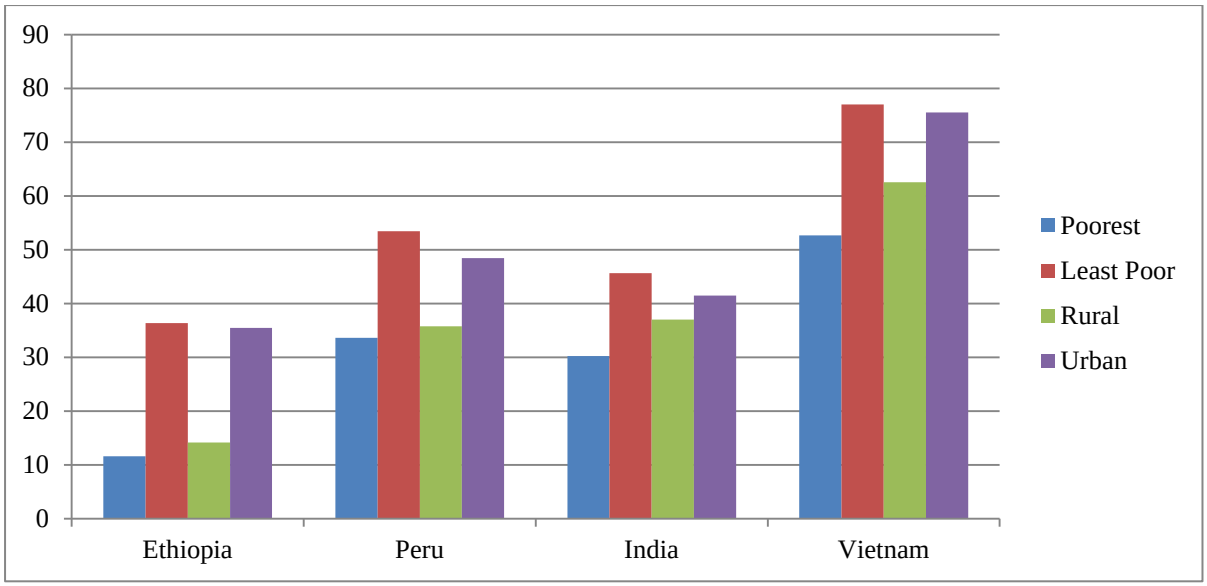


Figure 4: Maths Scores at Age 15 by Enrolment History[4]

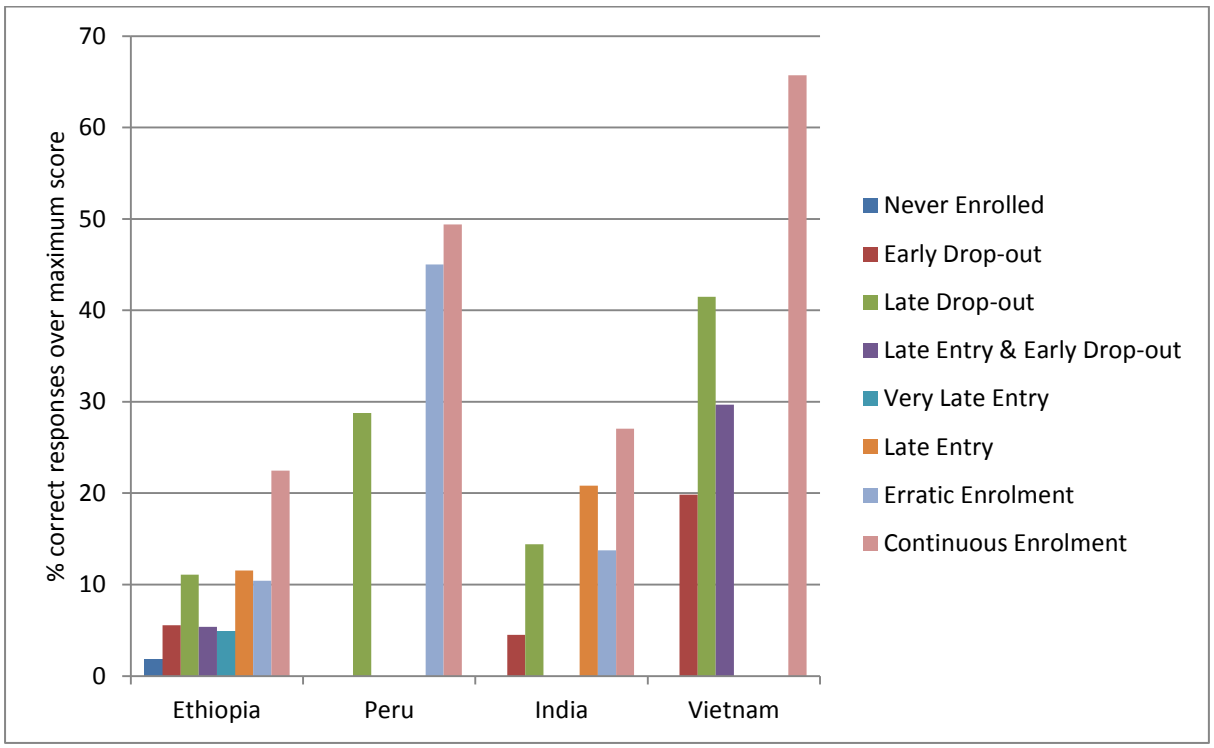


Table 6 presents the percentages of older cohort children enrolled in school at age 12 who went on to drop-out of school by the age of 15, disaggregated by achievement in maths at age 12. In all countries, a considerably higher percentage of children in the lowest achievement

[4] Groups of fewer than five pupils are excluded. Never Enrolled = no enrolment at R1, R2, R3; Early Drop-out = enrolment at R1 only; Late Drop-out = enrolment at R1 & R2 only; Late Entry & Early Drop-out = enrolment at R2 only; Very Late Entry = enrolment at R3 only; Late Entry = enrolment at R2 and R3 only; Erratic enrolment = enrolment at R1 and R3 only; Continuous Enrolment = enrolment at R1, R2, R3.

quartile at age 12 had dropped out by age 15 when compared to the highest achievement quartile.

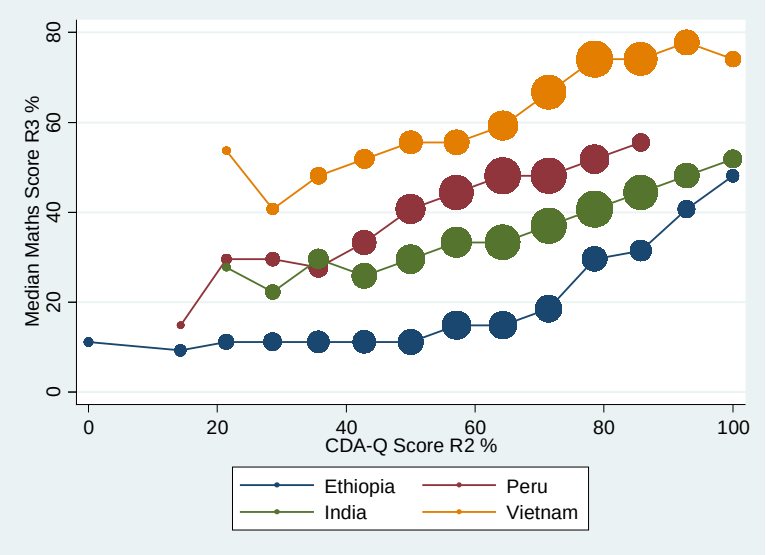
Table 6: Drop-Out between Ages 12 and 15 by Achievement at Age 12 (Older Cohort)

	Ethiopia (%)	Peru (%)	India (%)	Vietnam (%)
Total (all enrolled at Age 12)	9.54	8.76	9.61	23.40
Lowest Quartile Maths at Age 12	20.73	17.11	26.04	47.71
Highest Quartile Maths at Age 12	8.27	11.80	11.73	19.72

6. Learning progress

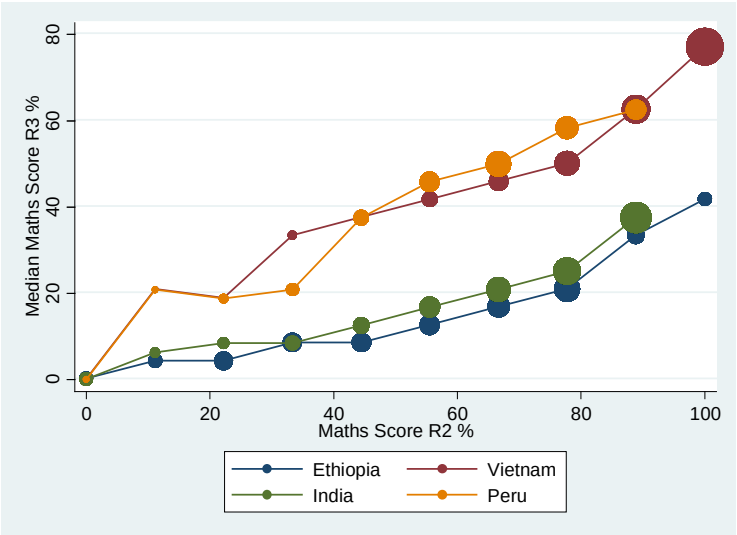
The differences in learning levels between countries illustrated so far reflect a variety of home background and school quality factors which are likely to have cumulative effects across the life-course of the child. In order to examine the progress made during a particular stage of the life-course, it is important to take account of prior learning. Accordingly we examine the achievement of pupils in maths in 2009 according to their performance in 2006, on the earlier maths or CDA-Q test. The results for the younger cohort of children are presented in Figure 5. Higher scoring children at age 5 also scored highly at age 8, but the age 8 scores are much higher across all levels of age 5 scores in Vietnam, followed by Peru, indicating that children across the range of performance learned substantially more in these countries, not linked to their prior learning or ability. Compared to a pupil with the same prior score in Ethiopia in 2006, a pupil's score in Vietnam in 2009 was typically 2 to 3 times higher. The gradient of the relationship between scores is similar across countries with the exception that there is no relationship between scores for those pupils scoring less than 50% in 2006 in Ethiopia, all of whose results on the R3 test are close to zero; and with some suggestion of higher learning increments for previously higher achieving pupils in Vietnam. To some extent the pattern in Ethiopia reflects the prevalence of late-entry of pupils to school, most of whom would have attended school for only a year at the time of the survey in 2009, while the pattern in Vietnam can be linked to a relatively high-performing school system.

Figure 5: Progress in Maths by CDA-Q Score (Ages 5 to 8)[5]



The same broad pattern is observed for the older cohort, as shown in Figure 6, although countries fall into two groups in this case – higher performing Vietnam and Peru and lower performing Ethiopia and India. Pupils in the high performing countries with the same initial score as those in low performing countries in 2006 scored twice as high or better in 2009. Learning progress in India at the same level of prior score is similar to that in Ethiopia, despite considerably earlier enrolment in India and in many cases more favourable background characteristics and greater per-pupil resources spent on schooling, suggestive of relatively poor school quality in terms of the production of maths skills at age 15.

Figure 6: Progress in Maths (Ages 12-15)[6]



[5] Median 2009 score by 2006 score. Points are shown for groups containing 50 or more pupils. The size of the points reflects the number of pupils in each group.
[6] Median R3 score by R2 score. Points are shown for groups containing 50 or more pupils. The size of the points reflects the number of pupils in each group.

It is instructive to examine whether the patterns differ within countries for pupils of different levels of background advantage. Figure 7 presents the data for the younger cohort by household wealth, comparing the top and bottom wealth quartiles. In all countries, more advantaged pupils in the younger cohort achieved notably higher scores in 2009 for the same level of performance in 2006. In Ethiopia, pupils in the lowest wealth quartile attained negligible scores in 2009 regardless of prior performance[7], despite around two-fifths being enrolled in 2006, while for the least poor group with the highest 2006 scores, progress is similar to that for the comparable group in India and Peru. Notably, however, progress is greater for the comparable group of poor children in Vietnam.

Figure 8 presents the progress data for the older cohort during the same period, 2006-2009, between ages 12 and 15. In Vietnam, the gap between more and less advantaged pupils' scores in 2009, based on their scores in 2006 is especially small. Disadvantaged pupils in Ethiopia and India are found to make relatively little progress, despite more than 90% enrolment at age 12 in both countries, while both groups make progress in Peru, with somewhat greater inequality than in Vietnam. The picture by enrolment is illustrated in Figure 9, where data are disaggregated according to whether pupils have been enrolled at all rounds of the survey (continuous enrolment). The gaps are widest in Vietnam and possibly Peru (although the numbers of pupils not continuously enrolled is small). This is consistent with learning levels and school-quality being higher in these countries, since missed schooling may be expected to result in greater privation of 'opportunities to learn'. The difference in learning levels between pupils by enrolment status in Ethiopia and India is sizeable only for pupils with high prior scores. This pattern might be taken to suggest that for weaker pupils in terms of prior achievement, interruptions to learning are less damaging, or, alternatively, that schools are less effective at teaching weaker pupils in India and Ethiopia. The latter interpretation is consistent with the suggestion of 'over-ambitious' curricula considered in Section 7.

[7] This does not suggest that children in Ethiopia had learned no maths but rather that they had not acquired the maths skills required for this test. While the test is considered age-appropriate, very many pupils in Ethiopia enrol late and accordingly have not learned skills which are considered age-appropriate internationally and by national curricula.

Figure 7: Progress in Maths (Ages 5 to 8) by Household Wealth[8]

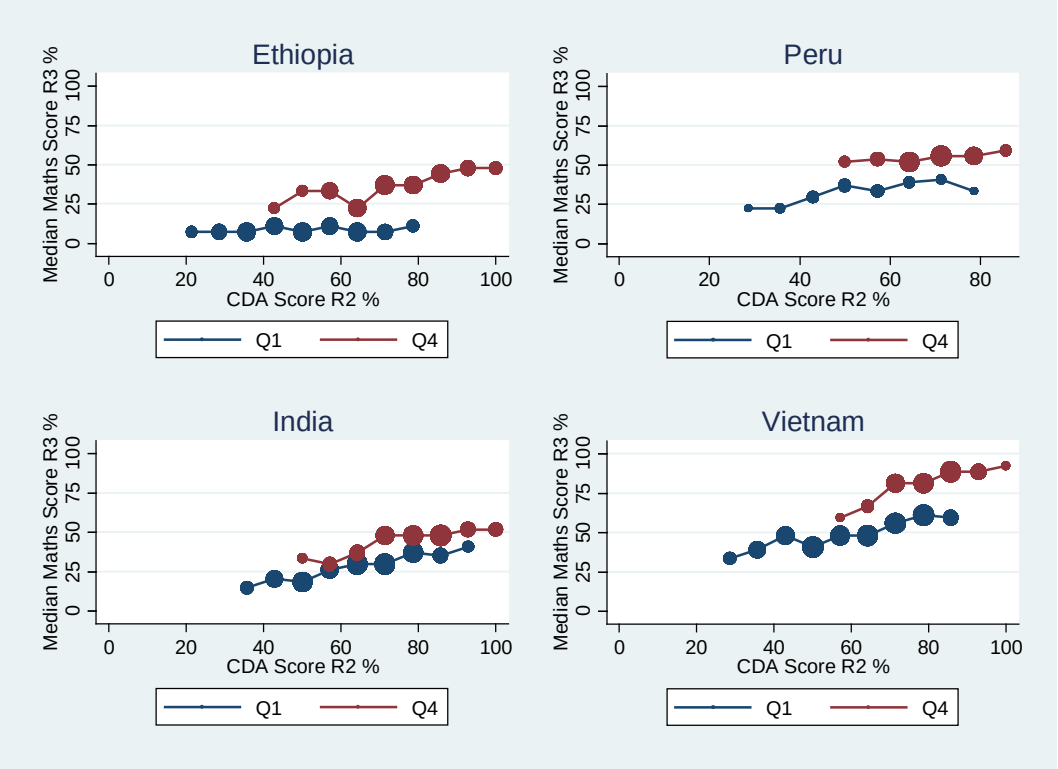
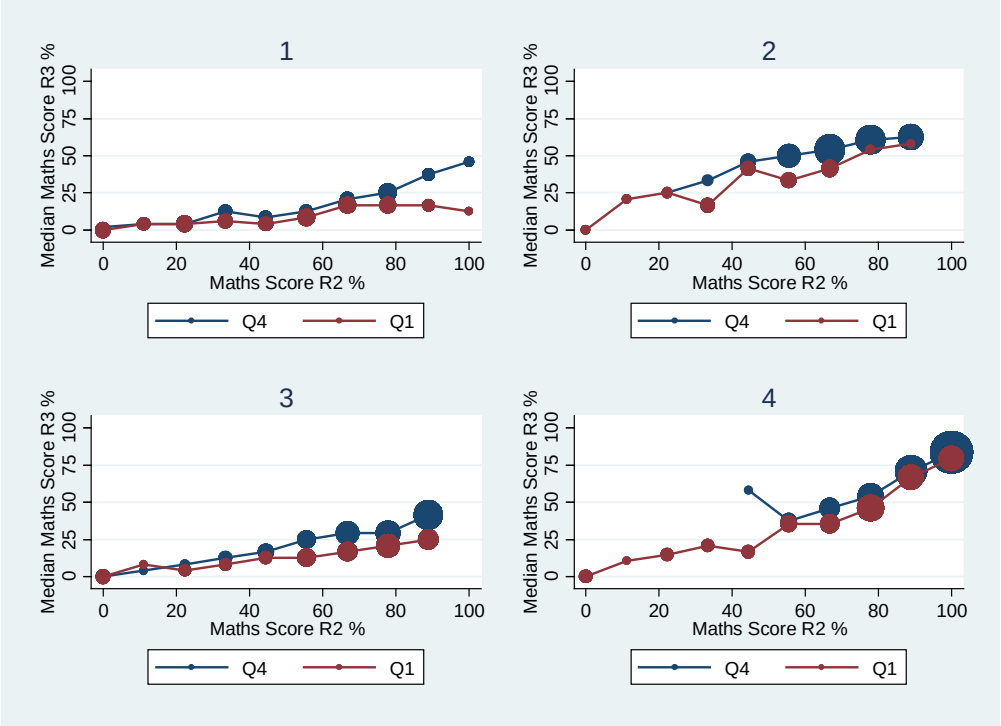
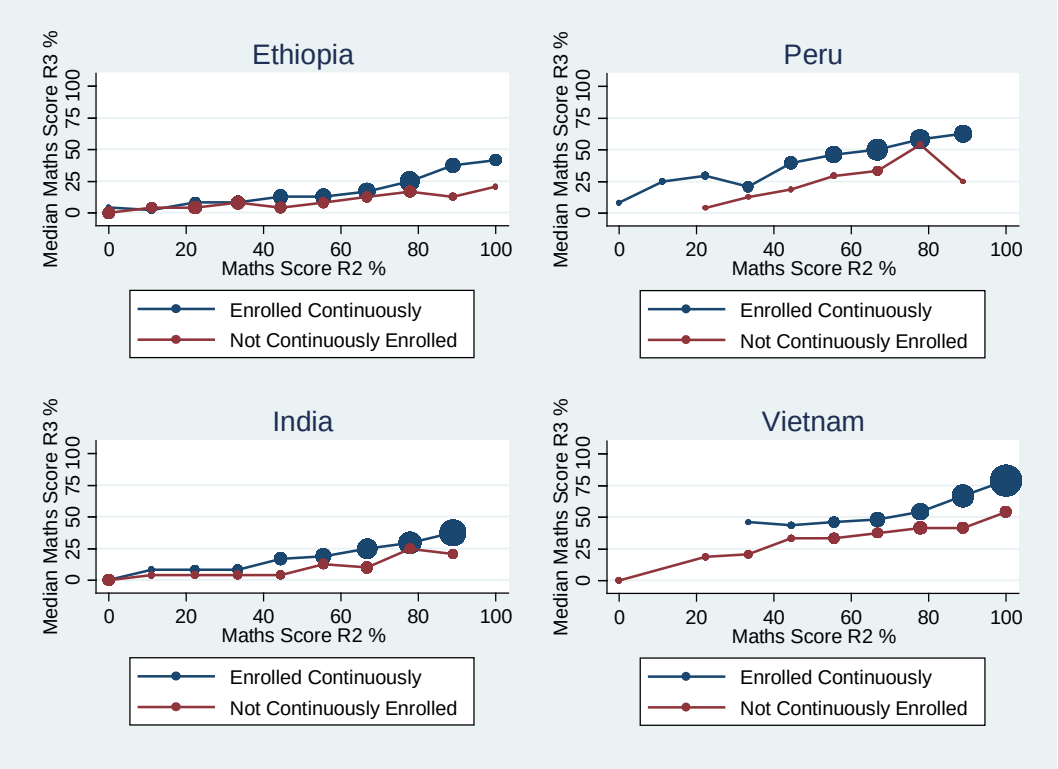


Figure 8: Progress in Maths (Ages 12-15) by Household Wealth[9]



[8] Median R3 score by R2 score and wealth quartile. Points are shown for groups containing 20 or more pupils.
[9] Median R3 score by R2 score and wealth quartile. Points are shown for groups containing 10 or more pupils.

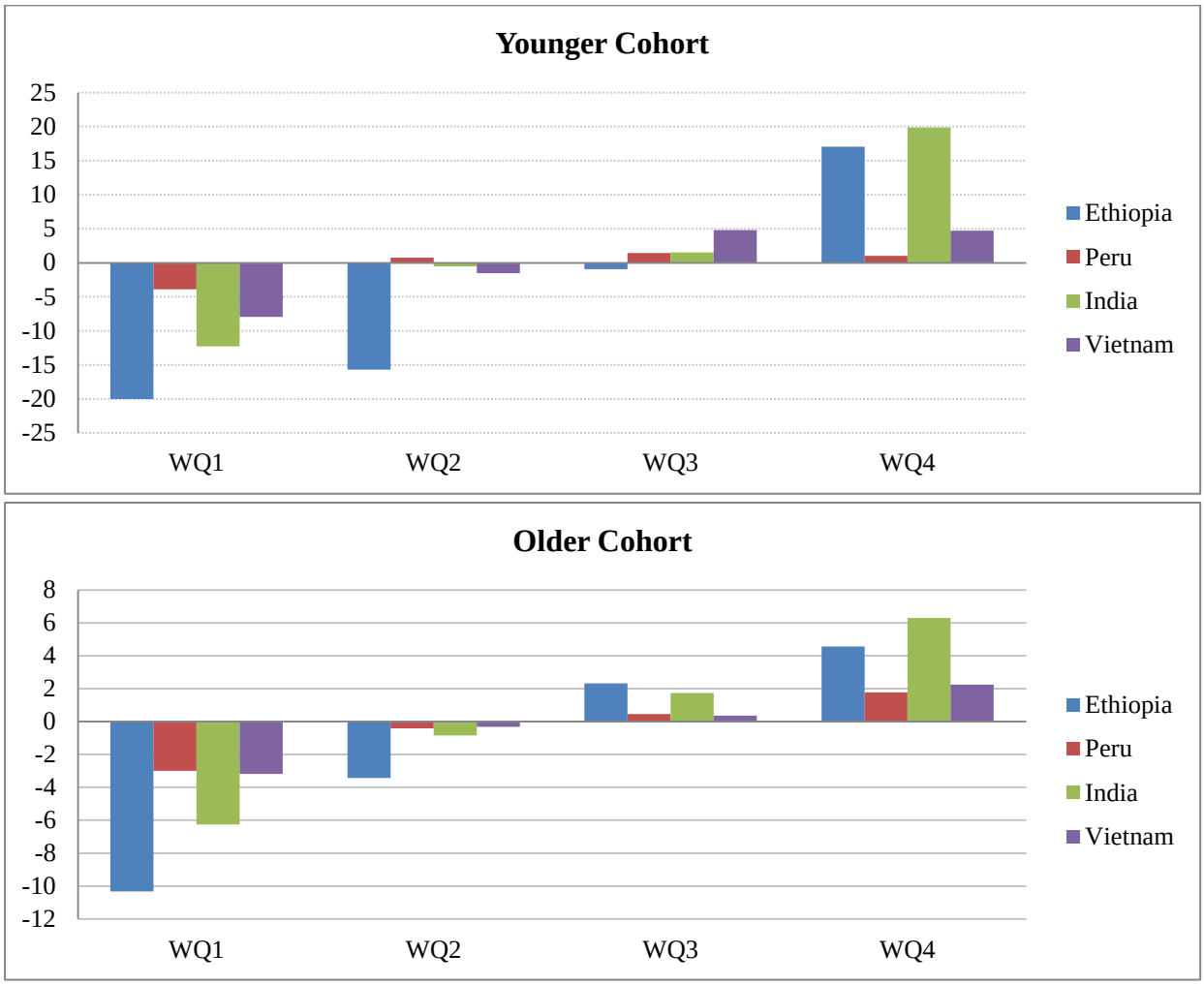
Figure 9: Progress in Maths (Ages 12-15) by Enrolment Status[10]



Although the scores on the PPVT cannot be compared between countries, it is possible to compare between time points and cohorts as the same test was administered in both 2006 and 2009. In order to examine differences in progress by pupils from more and less advantaged backgrounds, we predict the PPVT score in 2009 based on performance in 2006 on both PPVT and maths or CDA-Q (depending on the cohort under consideration), to take account of prior learning and more general ability, using a simple regression line for each country. We then examine how pupils performed compared to their 'expected score' three years later, i.e. how they performed compared to an 'average' pupil in the country with the same prior scores. Differences are expressed as a percentage of the mean score for the country. Differences by sex are found to be relatively small except in India, where girls 'underperform' and the gap between expected and actual scores between boys and girls is around ten per cent for both cohorts which amounts to a larger relative difference for younger pupils (overall mean score 92 for OC and 48 YC). By wealth and location of residence the gaps are large for the younger cohort in India and Ethiopia, as shown in Figure 10, indicating that poorer pupils with equivalent prior scores in 2006 achieved much lower scores than their counterparts from the least poor group three years later, suggesting a consolidation of disadvantage by children's household wealth.

[10] Median R3 score by R2 score and wealth quartile. Points are shown for groups containing 5 or more pupils.

Figure 10: Difference in Expected PPVT Scores by Wealth Quartile for the Younger and Older Cohorts



The patterns for groups by cross-cutting disadvantage are shown in Figures 11 (sex and residence) and 12 (sex and household wealth). Again, gaps are larger for the younger than for the older cohort. In Ethiopia, urban males are advantaged in the older cohort, while in India, rural females are especially disadvantaged and urban males especially advantaged. In Vietnam, urban pupils perform better than expected in the older cohort while otherwise differences are relatively small. Poor girls are especially disadvantaged and the least poor males especially advantaged in India. In Ethiopia, while wealth disadvantages overall are large, the interaction with sex is weaker. Poor girls show some greater disadvantage in Peru, but to a lesser extent.

Figure 11: Difference in Expected PPVT Scores by Wealth Quartile and Residence

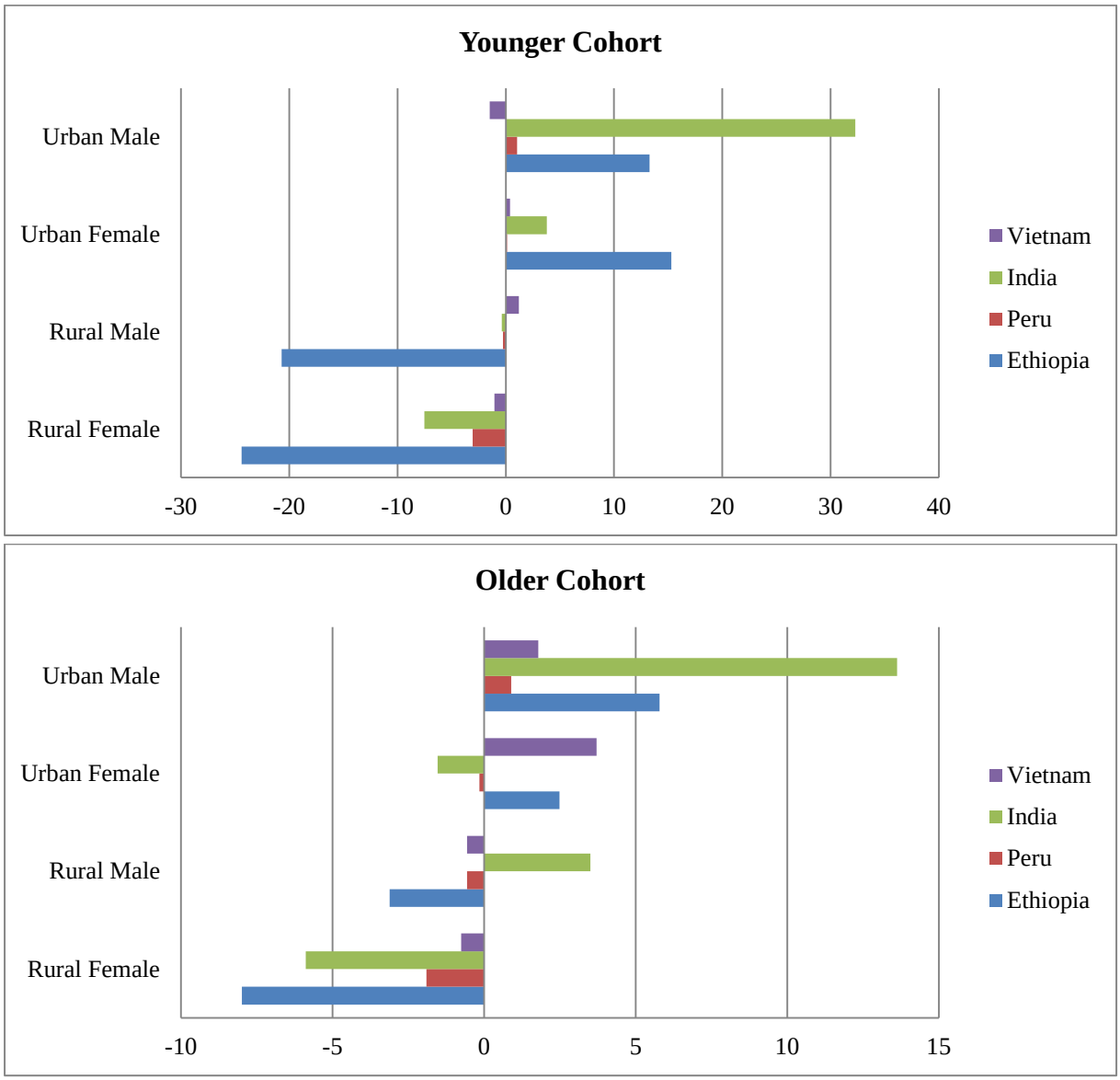
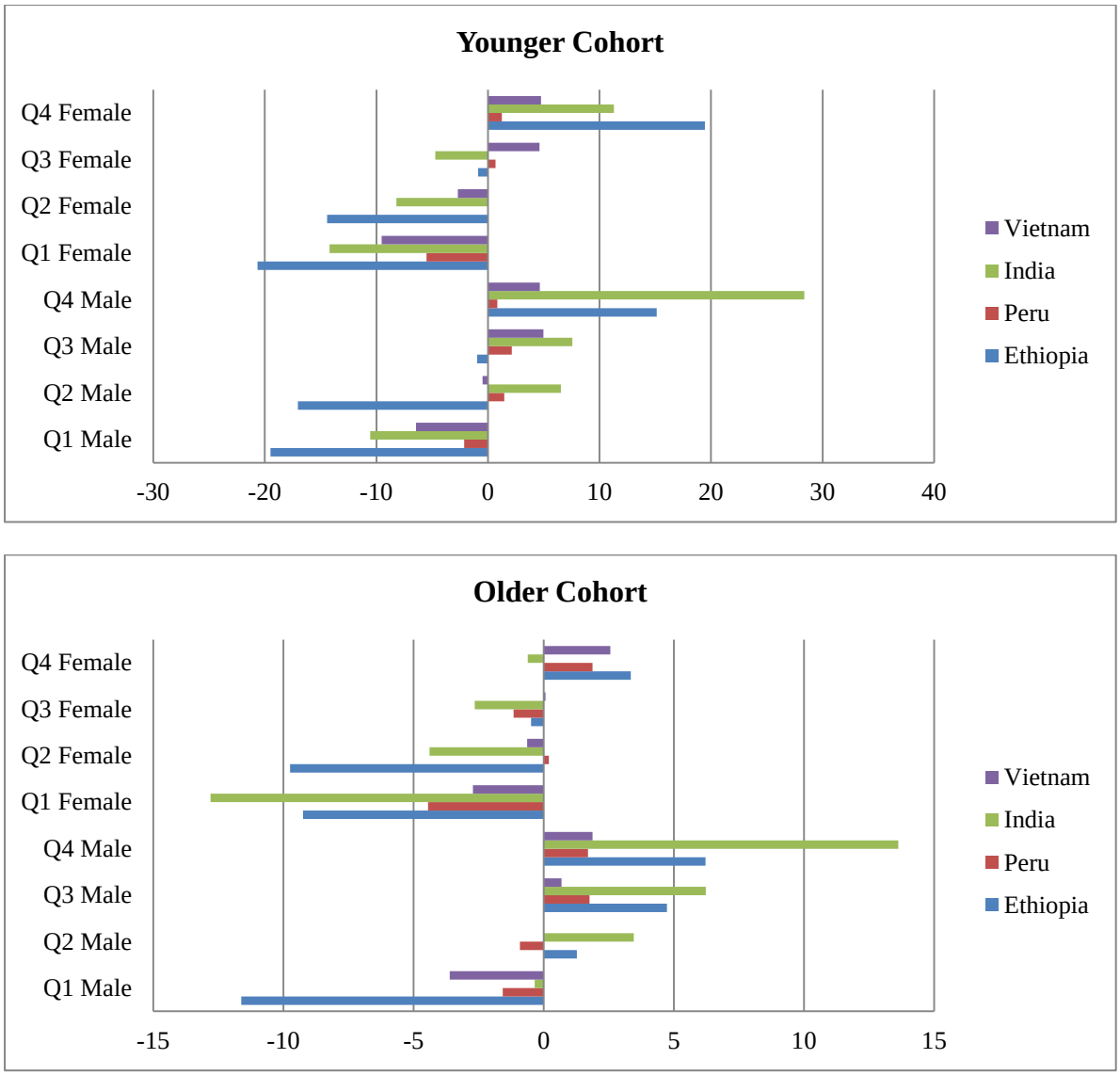


Figure 12: Difference in Expected PPVT Scores by Wealth Quartile and Sex



7. Learning and the Curriculum

Pritchett and Beatty (2012) have drawn attention to the importance of 'overambitious curricula' in consolidating the stagnation of children's learning in some developing countries, arguing that curricula which 'outpace' pupils' real learning act as a barrier to progress by encouraging teaching which is outside the range of what children can realistically master, given their prior learning; in the terms of psychology teachers are teaching beyond the 'zone of proximal development' (Vygotsky 1978). We examine this issue by making use of individual test items from the Young Lives' mathematics tests, comparing between India and Vietnam. As discussed in previous sections, despite similar levels of enrolment and progression, learning levels differ markedly between these countries and diverge substantially over time. While it is not possible to identify the precise role of curricula in explaining this divergence, we present suggestive evidence that where learning fails to 'keep pace' with

curricular expectations, this may lead to learning stagnation. In simple terms, when what is taught departs notably from what has been learned to date, pupils may find it increasingly difficult to progress.

Children's learning in Vietnam has been shown in the previous sections to develop measurably over time. Pupils perform well on average on tests administered at different ages which contain items of increasing difficulty and higher scoring pupils on earlier tests typically make greater progress. We also find that mathematics learning in Vietnam 'keeps pace' with curricular expectations through successive grades. In India, however, learning progress between tests is found to decline for pupils in higher grades, while curricular expectations across the grades do not differ markedly between India and Vietnam. This picture is consistent with findings from the ASER surveys (ASER 2013) which suggest limited improvement in children's reading and arithmetic levels both over time and as children progress through the grades. Table 7 and Figure 13 compare the performance of children in both countries over time on examples of simple items in the domain of 'multiplication number operations', using items approximately in-line with the grade specific expectation of mathematics curricula in both countries.

Table 7: Responses to Maths Items among Older Cohort Pupils over Time.

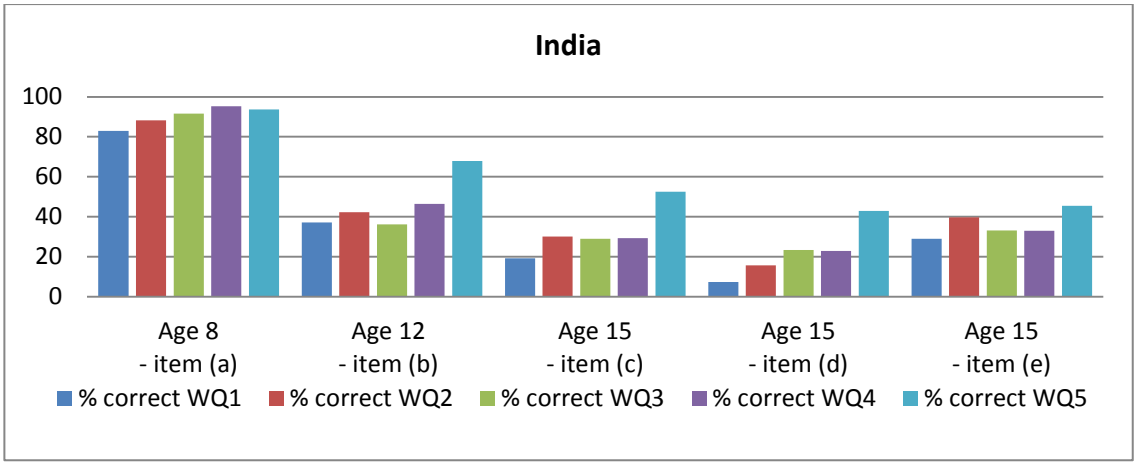
Age	Children's Grade in India*	Children's Grade in Vietnam*	Item	% Correct India	% Correct Vietnam
8	2-3	2-3	**(a)** 2 x 4	90.4	86.0
12	5-6	6-7	**(b)** A garden has 14 rows. Each row has 20 plants. The gardener then plants 6 more rows with 20 plants in each row. How many plants are there altogether?	46.2	52.1
15	8-9	9-10	**(c)** A garden has 14 rows. Each row has 20 plants. The gardener then plants 6 more rows with 20 plants in each row. How many plants are there altogether?	33.3	71.3
15	8-9	9-10	**(d)** $\frac{9}{8}$ x $\frac{2}{3}$	25.8	75.7
15	8-9	9-10	**(e)** About 7000 copies of a magazine are sold each week. Approximately how many magazines are sold each year?	35.8	55.4

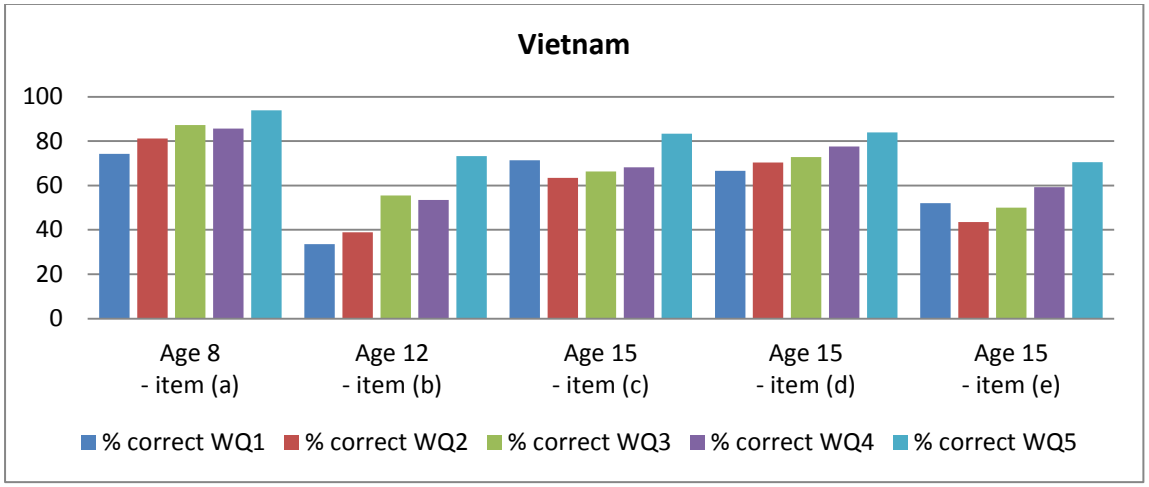
*These are the grades in which the highest proportions of OC children attend at the time of data collection

At Age 8, a similar proportion of children in India and in Vietnam responded correctly to the simple item (a), which represents the simplest level of understanding in maths. When presented with item (b) at age 11-12; a two-stage word problem involving multiplication and addition, approximately half of all children in each country responded correctly. When the same item was asked again at age 14-15 (item (c)), notably more children (around three-quarters) in Vietnam were able to answer correctly, but in India, the percentage of children answering correctly decreased. With regard to items (d) and (e) which are consistent with the curricular requirements for 15 year olds, a majority of children in Vietnam (up to 75%) were able to answer correctly, while only around a third of children in India could do so. Figure 13 disaggregates the findings by wealth quintile. It shows that children from more advantaged households are more likely to respond correctly in both countries. Items (b) and (c) are of particular interest. These are the same question administered at three years apart. In Vietnam,

children make progress on ability to answer this item between ages 12 and 15, moreover the poorest group appears to show the most learning gain. In India, children from all wealth quintiles are less likely to answer correctly at age 15 and the gap in performance between the poorest wealth quintile and the least poor quintile appears to get larger as children get older.

Figure 13: Responses to Maths Items by Household Wealth Quintile





The differences in learning profiles between India and Vietnam illustrated here raise questions about differences in functioning between these educational systems, linked to the differences in learning levels and learning progress considered so far. Table 8 compares the two countries on key indicators from the school surveys. The divergence of learning levels over time in India and Vietnam occurs in qualitatively different education systems especially during the middle and later stages of basic education. Teachers in Vietnamese schools have significantly more years of teacher experience than their counterparts in both the private and government sectors in India, and have always received some formal teacher training, while a notable proportion of teachers in India have no formal training (41% of surveyed teachers in the private sector). While Vietnamese teachers are teaching in classes with slightly larger average numbers of students, they are more likely to teach in a class where most children have individual access to a maths textbook and are themselves rarely absent, compared to Indian teachers whose absenteeism is typically much higher. However, within India it is also clear that large heterogeneity exists between the government and private sectors, as is

discussed extensively in the literature (see for example Kingdon 2007). Teachers in the government sector are well remunerated by comparison with those in Vietnam, but relatively few children report they consistently check and mark homework. By any standards the remuneration of teachers in private schools attended by the Young Lives children is low. The differences in observed characteristics such as formal teaching qualifications between public and private school teachers favour those in public schools, suggesting something of a puzzle in relation to learning outcomes which has received some attention in research and which may be linked to systems of accountability, the extent of 'social distance' between pupils and teachers among other factors. What is clear from the Young lives data is that in an analogous way, simple observable differences between the systems in India and Vietnam go only a limited distance in explaining large differences in learning. This may be unsurprising given that more complex differences in pedagogical practices, school management and organisation, and, as we have highlighted, 'curricular pace' are likely to play an important role.

Table 8: Comparison of school indicators – India and Vietnam

Indicator	Vietnam	India		
		Total	Government	Private
Mean class size	27.61	24.18	16.23	31.55
Mean years of teacher experience	17.47	6.41	7.71	4.96
Mean monthly teacher salary (USD/Month)	140-164[11]	150	226	67
% of teachers with no formal teacher training qualification	0%	27.82%	16.50%	40.74%
Teacher absenteeism	2.34 days per year[12]	33.20%[13]	35.12%	31.05%
All children have access to maths textbooks	96.16%[14]	73.51%[15]	60.84%	82.54%
Teacher always checks/marks maths homework	41.28%[16]	32.49%[17]	18.06%	53.01%

Data from the school survey in Vietnam sheds further light on the issues considered above. Pupils were tested on curriculum-based maths at age 10 and again at 11 – at the beginning and end of Grade 5. These tests are more comprehensive than those administered in the household and were designed specifically to measure progress in relation to curricular expectations. Since the tests assess grade-specific curricular knowledge, pupils who are close to the 'target knowledge' are able to make less progress, but what is notable is that those initially further from the target make good progress in relation to expectations by the end of the school year. While we do not have comparable evidence for India, teachers in Vietnam were asked to report their own assessments of pupils' performance in maths and Vietnamese

[11] As recently reported in the media: http://talkvietnam.com/2012/10/study-urges-reforms-in-vietnam-teachers-salaries/#.UWH8219wbiw. Young Lives did not collect data on teacher salaries in Vietnam.
[12] Mean number of days of teacher absence reported in the school register
[13] Pupil 's response to the question 'my class teacher often does not come to school'
[14] Pupil's reported ownership of maths textbook
[15] Observation of prevalence of textbooks in class observation
[16] Pupil reported
[17] From observation of pupils maths workbooks

reading comprehension (on a 0-10 scale), which may be employed to examine the extent to which they were aware of their current learning levels, an awareness which is key to understanding how to enable pupils to progress effectively. We compare the teacher ratings in maths (provided at the beginning of Grade 5) to scores from the Young Lives school survey test at age 10, taken at the same point in time in Table 9. The results are remarkably consistent, indicating that on average teachers were very well aware of the level of curricular mastery reached by their pupils.

Table 9: Teacher Ratings of Pupil Performance in Maths Compared to YL Test Scores

Teacher Rating	Mean YL Test Score
0	402
1	437
2	468
3	470
4	486
5	489
6	520
8	541
9	558
10	604

Achievement overall in Vietnam is high by comparison with other countries in the lower-middle income group, and on some measures compares favourably with certain high-income countries (see World Bank 2011). Nonetheless, inequality in performance is also relatively high on certain measures. Figure 14 presents data on the percentage of children able to answer a Grade 4 arithmetic item correctly, overall and in two selected sites, one in predominantly rural and disadvantaged Lao Cai province, and one in relatively wealthy urban Danang. It shows a gap of more than thirty percentage points at the beginning of Grade 5. We are able, however, to examine differences in rates of learning progress in relation to the skills required in Grade 5, which is more informative.

Figure 14: Percentage of children able to answer "75683 + 1507 – 93" correctly at the start of Grade 5

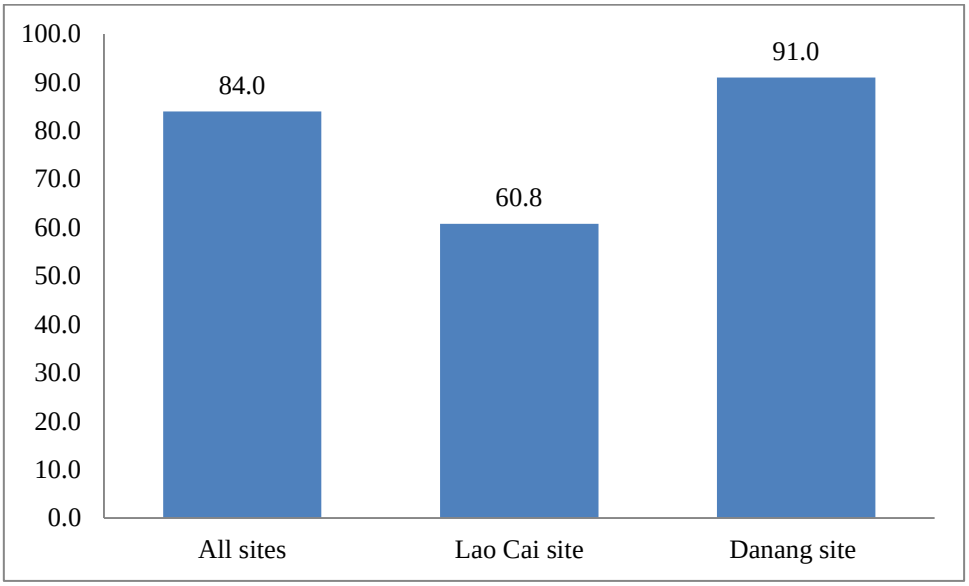


Figure 15 shows the percentages of children who correctly answer another Grade 4 item at both the start and end of the school year. While children in the advantaged Danang site have less progress to make (since 70% answered correctly in the first test), children in the disadvantaged site make strong progress, narrowing the gap by more than twenty percentage points on the core arithmetic skill being measured. Tests also included more 'lateral thinking' maths items presented in unfamiliar ways, intended to measure less 'algorithmic' understanding of appropriate curricular concepts - in this case understanding fractions. Figure 16 shows the results for this example item, where progress is much greater in the advantaged site, perhaps due to those pupils' earlier mastery of more basic mathematical concepts, but nonetheless showing 'appropriate progress' taking account of prior learning.

Figure 15: Responses to the Grade 4 item "(20+20) / (4x5)"

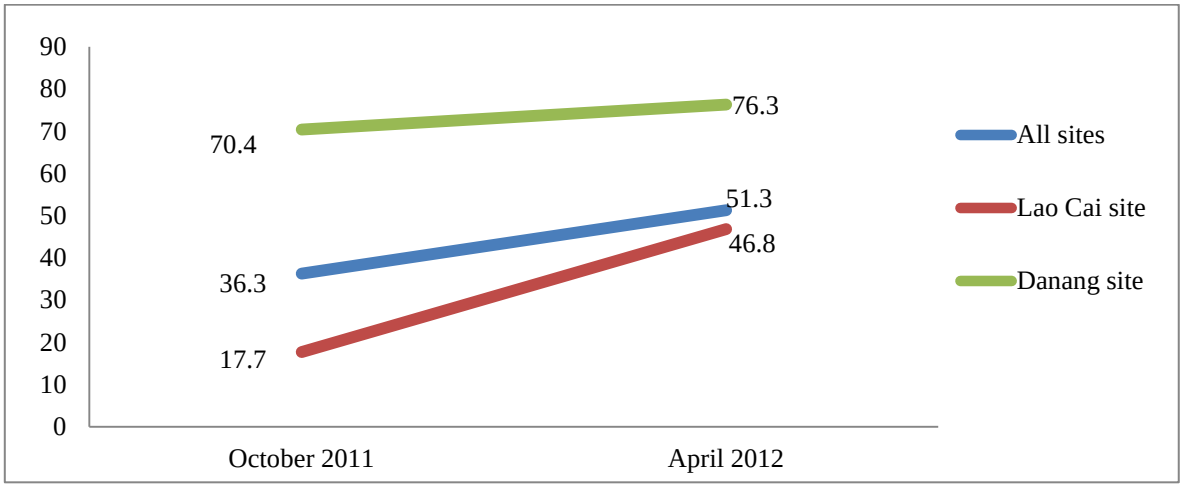
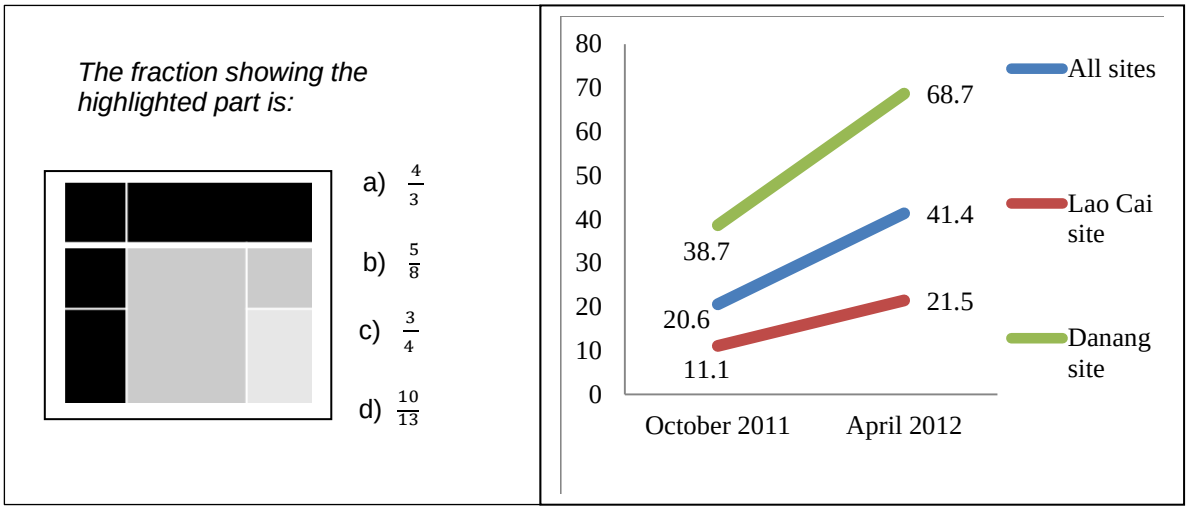


Figure 16: Responses to an Unfamiliar Maths Item on Understanding Fractions



In terms of the gain made between the two tests more generally, larger than average gains are observed in the four least advantaged sites in both maths and reading. Levels of achievement in both subjects were higher among girls both at the first and second test, although the gap between boys' and girls' achievement narrowed (boys caught up) to be statistically insignificant by the second test in maths, as shown in Figure 17. The gap in achievement in Vietnamese between girls and boys is somewhat larger and was not reduced between the two tests. Pupils from the Kinh majority ethnic group showed higher levels of learning achievement than ethnic minorities at both tests, but the gap was found to be narrowing over time as greater progress was made by non-Kinh, especially in Vietnamese. An indicator which may be considered illustrative of a combination of background factors is the extent to which Vietnamese is the language spoken at home. While Kinh families normally speak Vietnamese at home, some ethnic minorities also speak Vietnamese sometimes or always at home, often those with more formal education. Figure 18 illustrates the stark differences in achievement in both subjects according to how often Vietnamese is spoken at home, but also shows the substantial narrowing of the gap due to the progress made by those pupils who never speak Vietnamese at home.

Figure 17: Learning Achievement and Progress by Gender

Mathematics **Vietnamese**

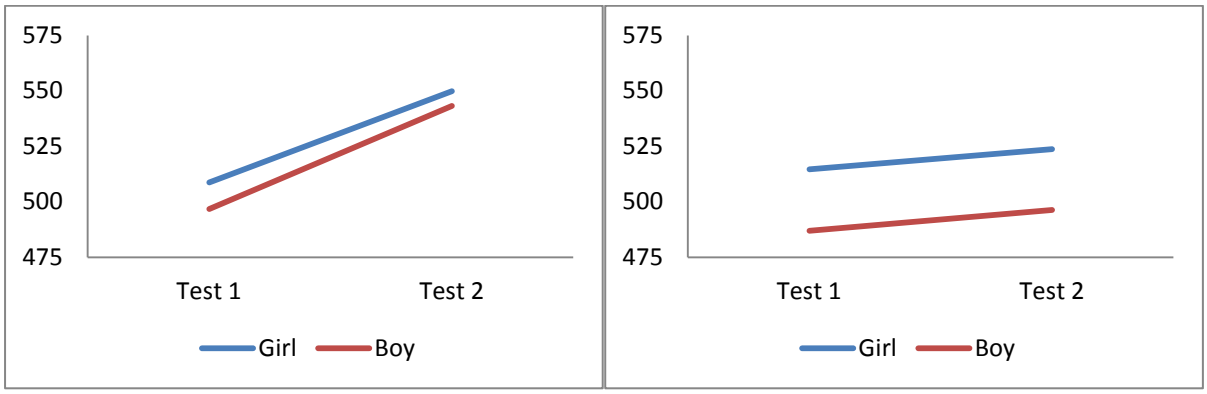
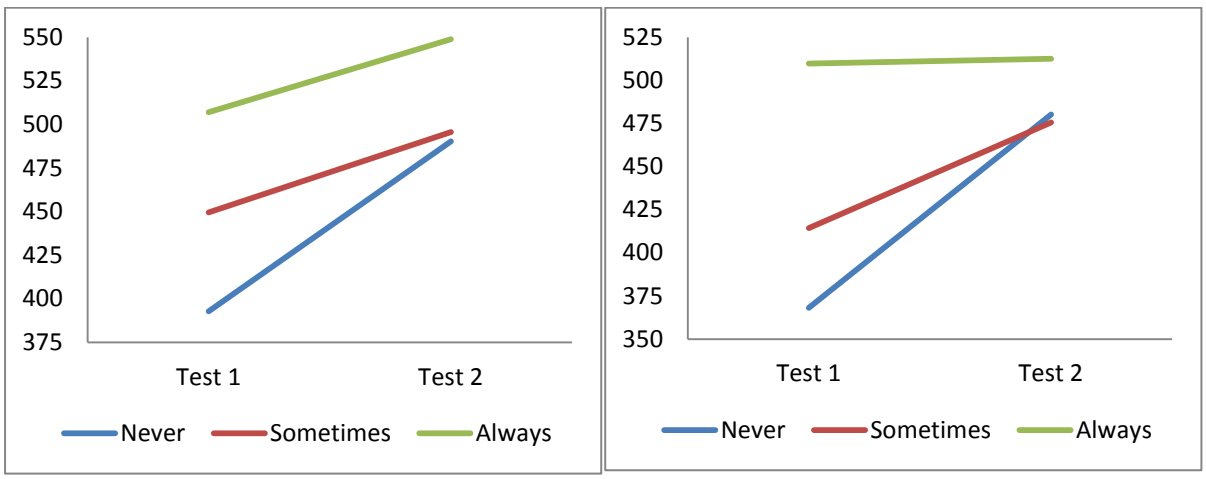


Figure 18: Learning Achievement and Progress by Frequency of Speaking Vietnamese at Home

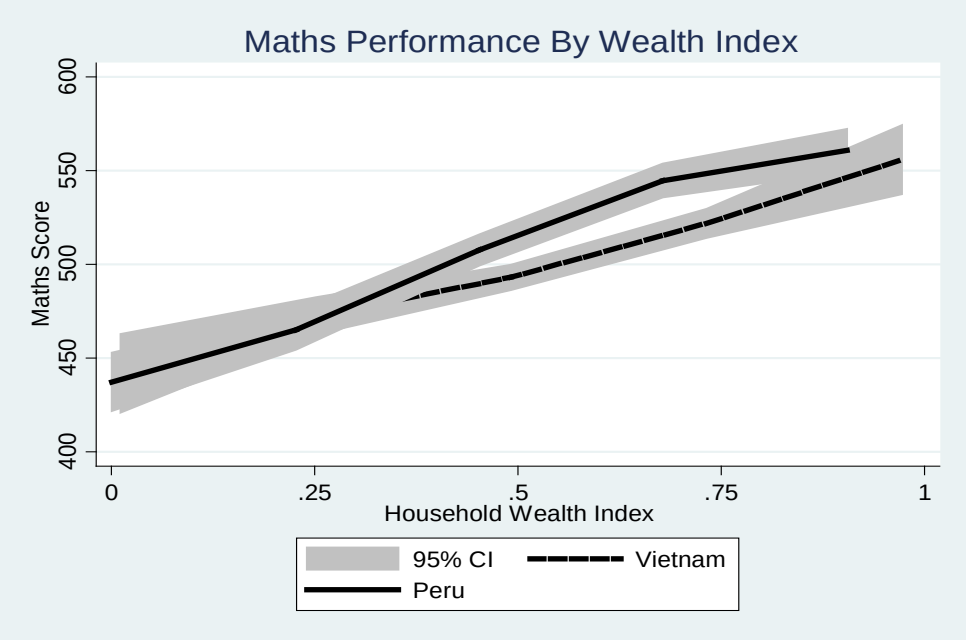


8. The Benefits of Quality Schooling[18]

School quality or effectiveness, considered in terms of the contribution made by schools to pupils' learning when taking account of their backgrounds, is one of the most important factors among the determinants of learning progress. The extent to which differences in school quality either compound or mitigate the effects of pupils' home backgrounds depends on (i) the prevalence of school 'sorting'; that is the extent to which more advantaged children access higher quality schools and (ii) whether and by how much schools overall are more effective at improving the learning of more advantaged pupils. We examine these issues comparatively for Peru and Vietnam, which provide examples of contexts in which learning is comparatively strong, while to some extent unequal, more notably in Peru. Figure 19 illustrates the relationships between household wealth and maths scores in both countries, showing stronger increments in tests scores for pupils from more advantaged backgrounds in Peru, which likely are in part due to differences in the impact of household wealth and associated background advantage on learning, but also potentially to school 'sorting' and to differential school quality effects. Attainment tests are designed to be country and curriculum-specific (as well as grade-appropriate in the case of Peru). Mean pupil test scores are set to 500 for both countries with standard deviation equal to 100, and two-thirds of pupils' scores lie in the range 400-600[19].

[18] This analysis is extended in Krutikova et al (2014, forthcoming).
[19] The standard deviation is set to 100.

Figure 19: Maths Performance by Wealth Index in Vietnam and Peru



Before considering the relationship between school quality and attainment, a useful starting point is provided by the examination of how much disparity there is in mathematics attainment at the school level in the two samples. Figure 20 shows the distribution of school mean test scores in mathematics for Peru and Vietnam. The distribution of school means is wider in Peru and more concentrated in Vietnam, indicating that inequality between schools in terms of average performance is greater in Peru. More precisely, in maths the intra-school correlation[20] between pupils' maths tests scores is 0.44 in Vietnam and 0.56 in Peru as shown in table 10, so that variation between schools and homogeneity within schools on test-scores is relatively lower in Vietnam. Mean scores at the school level are, however, a function of both the quality of schools and the nature of their intakes. We re-estimate the intra-school correlations controlling for comparable pupil background characteristics at age 5 comprising their age, gender, ethnicity, height-for-age, birth order, mother tongue, CDA-Q score (treated as a pre-school cognitive development measure), pre-school attendance and hours of work. We also include other background measures, related to the child's main caregiver, including caregiver's level of education, aspirations for child's education and professional career, and subjective well-being. We include household-specific characteristics, such as geographic location, sex and education of the head of the household, whether parents are in the household, and the wealth index. After controlling for children's backgrounds, Table 10 shows that the correlation falls to 0.32 in Vietnam and 0.52 in Peru. This suggests that even when differences in the backgrounds of pupils at pre-school are accounted for, there remain large differences in maths scores between schools, indicating important effects of school quality differences, most especially in Peru.

[20] An intra-class correlation coefficient is a statistic that describes how strongly units belonging to the same group resemble each other in terms of a quantitative trait (i.e. cognitive achievement scores).

Figure 20: School level variance in attainment in mathematics

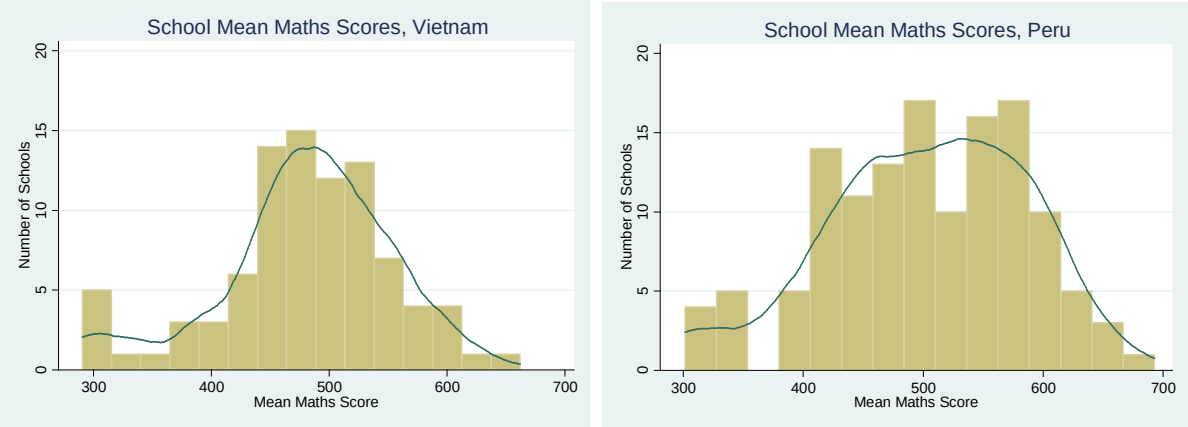


Table 10: Within-School Correlation in Pupil Maths Test Scores at Age 10 in Mathematics

	Vietnam	**Peru**
Without conditioning for pupil background	0.44	0.56
Conditioning for pupil background	0.32	0.52

We estimate summary measures of school quality[21] based on the average school-administered maths test scores in each school in the Young Lives school survey sample[22] for these two countries, taking account of pupils' backgrounds in terms of the child, care-givers and household characteristics at pre-school age outlined above. Table 11 shows that mean attainment in mathematics increases with school quality, as measured by the fixed effects. The difference in mean score between schools in the bottom and top quality quartiles is more than 100 points for both countries, although the gap is more pronounced in Peru.

Table 11: Mean scores in mathematics by school quality quartile (standard deviations in brackets)

School quality quartile	Vietnam	Peru
Lowest	437 (93.5)	434 (112)
2	488 (71.3)	485 (80.2)
3	522 (93.2)	541 (87.7)
Highest	562 (78.7)	578 (68.8)

As discussed earlier, there are two main channels though which school quality may have differential impacts on pupil attainments. On the one hand, it may be the case that more disadvantaged children are accessing lower quality schools. Table 12 presents the mean

[21] In order to measure school quality, we employ 'school fixed effects' to take account of both observed and unobserved school-level factors that may affect children's achievements.
[22] The samples comprise 548 younger cohort index children in 131 schools in Peru and 1138 children in 91 schools in Vietnam.

school quality measure by pre-school wealth quartile. For ease of interpretation, the estimates of school quality are centered on zero, where positive (or negative) values point to higher (or lower) than average school quality. In both countries, there is a clear tendency for children from wealthier backgrounds to go to better quality schools. Nonetheless, the differences in the sorting into schools are not as large as the differences in the average performances in terms of *school quality* between schools in the bottom and top quality quartiles shown in Table 12.

Table 12: Mean Standardised Estimates of School Quality (measured in test score points) by Pre-School Wealth Quartile

Pre-school wealth quartile	Vietnam	Peru
Lowest	-11.4 (47.6)	-15.9 (59.4)
2	-0.6 (44.2)	-1.6 (59.4)
3	-3.7 (43.0)	9.4 (43.2)
Highest	12.9 (36.9)	8.0 (38.9)

The other channel through which school quality differentially children of different backgrounds operates *within* schools. Conditional on the entry to a given school, there may be differential effects of school quality alongside the home background dimension, such that schools may be differentially effective in teaching to children with particular home backgrounds. In order to test this hypothesis, we examine whether estimated school quality for children attending the same school differs depending on the pupils' pre-school wealth levels on a subsample of schools in which we have simultaneously better- and worse-off children. In order to not restrict the sample excessively, we compare the bottom 60% of children with the top 40% with respect to their pre-school household wealth[23]. Figure 17 shows that in Vietnam schools are equally effecting in teaching Maths to children irrespective of their home backgrounds. Indeed, the average incremental school effect for children in the top 40% of the wealth distribution is not insignificant and even negative. On the contrary, in Peru schools appear to be significantly less effective at teaching children from disadvantaged backgrounds. The magnitude of the mean positive increment in school quality for children in the top wealth quintile is equivalent to a movement from the 35th percentile to the mean of the maths scores distribution.

In summary, we find that the quality of schooling plays a powerful role in explaining variation in children's attainment in mathematics in both countries. While a part of the explanation lies simply in differences in quality between schools, we find that children from poorer backgrounds are more likely to access lower quality schools and that in Peru this negative selection effect is compounded by marked differential school effectiveness in favour of more advantaged pupils. Moreover, in Peru, independently of the school they access, poorer children also suffer negative background effects on their attainment.

[23] In this way, the sample size decreases from 1138 to 932 children in Vietnam and from 548 to 302 children in Peru.

Consequently, while improved school quality for all remains a desirable goal for both countries, we find that in Peru emphasis should also be placed on how education investments and school quality are distributed across children from different socioeconomic backgrounds. Improving quality in the schools attended by the poorest pupils is likely to improve learning, while there are also potentially large benefits from improving the incidence of benefits of school quality within schools – to ensure that disadvantaged pupils' learning progress is raised in line with that of more advantaged pupils at any given level of school quality. This may require a more egalitarian or more targeted teaching strategy, or indeed more appropriate curricular expectations, to the extent that weaker benefits for disadvantaged pupils stem from 'teaching to the top'. In the absence of policies intended to narrow such gaps, disadvantaged pupils suffer three mutually reinforcing negative effects (i) disadvantaged home backgrounds (ii) selection into poorer quality schools and (iii) lower relative effects of school quality. While there is notable variation in school quality in Vietnam, the link with pupils' backgrounds is much weaker than in Peru, where this combination of forms of disadvantage may be particularly pernicious for some pupils.

9. Discussion & Conclusion

We have presented indicative evidence of the importance of school enrolment for learning progress and on the differences in learning levels and progress between countries, linked to pupils' backgrounds. Performance on all comparable Young Lives tests is highest in Vietnam, followed by Peru, India and Ethiopia. This ordering of countries also applies when considering learning progress, taking account of prior scores; but is somewhat reversed when considering inequality in learning between countries when data are disaggregated by indicators of disadvantage.

Young Lives data indicate that enrolment is improving equitably in Ethiopia, likely linked to policies to improve access in under-served areas (MOE 2008). Levels of learning and learning progress are low, however, except for the very most advantaged pupils, for whom they are moderate. Enrolment is part of the explanation, but levels of inequality between poor and less poor and urban and rural children are high, even for those pupils with high levels of enrolment. Enrolment is high and relatively equitable in India and learning levels in the earlier years of schooling are moderate or better, compared with those in much higher income Peru. Learning progress, however, especially at the latest stages of schooling, is relatively low and the absence of very large gaps between more and less advantaged pupils in maths may be considered a function of the generally low levels of progress; while gaps are more notable in vocabulary learning, which is less directly linked to schooling. Enrolment is also high and relatively equitable in Peru and learning and learning progress are relatively high within the Young Lives sample. However, given that this is both the highest income country and that with the greatest level of education spending, this may be considered less favourable, especially by comparison with Vietnam, but also given that in the earlier years it compares with India.

Differences in schooling systems are important explanations of learning gaps between countries, and differences in school quality within countries likely further explain learning gaps between more and less advantaged pupils within countries. However, despite an extensive literature which sets out to identify the importance of school, class and teacher-level inputs for pupil learning, there is little general consistency in the available international evidence (see Glewwe et al 2011), partly because the role of individual factors varies by context and also because of the complex interdependence between very different dimensions of school quality, ranging from infrastructure and resources to pedagogy and curriculum. Nonetheless, research on school quality which focuses on summary measures such as 'value-added' by schools and teachers typically finds large differences in 'effectiveness' measured in terms of schools' and teachers' overall contributions to learning, which may be interpreted as the result of particular 'bundles' of inputs and processes, while it is difficult to disentangle the effects of particular components. Moreover, some of the key contributors to school quality are difficult to quantify. Among these we may count teacher motivation, school leadership and the appropriateness and relevance of curricula and learning materials.

Even when the majority of Young Lives children are enrolled in school, large differences in learning outcomes are evident, attributable in many respects to system-level factors. The similarity between enrolled children's outcomes in Ethiopia and pupils in India suggests that were Ethiopia to achieve universal enrolment and perhaps admit children to school at an earlier age, children's learning achievement would likely be at a similar level to India. This underlines the crisis of quality characterising the much more established system in India, where access has been near universal for a decade, but where learning levels remain low and progress weak. The Indian example is perhaps instructive in the Ethiopian context, where it will be important that due attention to paid to improvements in quality in the next decade. In Peru, standards are generally high, but when seen in relation to education spending, the differences between both schools and children are large. By contrast, in Vietnam standards are high and the specific targeting of inequality in national policy is likely linked to a relatively equitable distribution of school quality. Improving equity in learning progress requires particular attention to learning among the most disadvantaged groups, and targeted policies which explicitly focus on improving educational access and quality for the least advantaged are arguably good not only for equity, but may be the most efficient way to improve levels of learning overall.

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