Levels, Dispersion and Gradients of Learning: Comparing Linked Panel Data Results across Four Developing Countries

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I present fresh descriptive evidence on the distribution of student achievement using unique data on quantitative skills with identical test administered across Ethiopia, Andhra Pradesh state in India, Peru and Vietnam to children aged 5, 8, 12 and 15 years. I link test scores across age groups, across countries and to the international distribution of mathematics proficiency in TIMMS using Item Response Theory models.

First, I show that the absolute level of quantitative learning is low across the board; even at the 75th percentile, in three of the four countries covered in this paper children at the age of 12 are behind the average performance of 10-year old children in most OECD economies for which comparable data are available. Second, I document that there is a clear pattern of stochastic dominance across these four study areas at all age groups with children in Vietnam at one end and children in Ethiopia at the other with Peru and India in between. Third, I note that this difference in levels of quantitative skills is apparent even at the age of 5 years before children have enrolled in schools, indicating important differences having arisen out of preschool and home-based investments across the four countries.

Focusing on methodological issues, I show that the the exclusive focus of international testing programs on children who are currently enrolled is importantly and significantly misleading especially at the age of 15 years when the proportion of drop-outs is significant in developing countries. Further, I demonstrate that the standard deviation of test scores differs by up to 40% even on the same test administered across different samples, thus implying that comparing normalized test scores across studies expressed in units of the standard deviation of test can be substantially misleading. This is especially relevant since recent attempts at comparing the cost-effectiveness of different randomized educational interventions compare studies in terms of the cost-per-SD of impact.

Finally, I estimate value-added models to compare the effectiveness of a year of schooling across these countries and differences in learning associated with wealth, various child and household characteristics and household investments.