L16 Education Policy and Development

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Introduction

- **Q1:** What are effects of education on productivity and incomes?
- **Q2:** Evidence on effectiveness of specific education policies on education?

*References:* Orazem, Glewwe and Patrinos, ‘The Benefits and Costs of Alternative Strategies to Improve Educational Outcomes’ (besides Ch 18 in UPP)
OLS estimates of Private RoR to Education in LDCs

- Mincer regressions of log earnings on years of schooling, with age and experience as controls
- Table 4.1 in text reports results from 63 household cross-section data sets from 42 LDCs
- OLS estimates of RoR for males: 7.2%, for females 9.8%; urban: 8.3%, rural 7.5%
- Higher for higher percentiles of the earnings distribution (interquartile range: 5-10% for males, 9-12% for females)
Key points to note

- Average RoR significantly positive (remember growth regressions!); slightly higher than for developed countries
- Higher than returns to most investments in physical capital
- Higher for women
- Higher in urban areas
TW Schultz argued value of education expected to be higher in dynamic environments, e.g. when technology is changing, when new opportunities arise.

Supporting evidence: returns to education in rural areas of India and Indonesia rose during the 1970s in areas most affected by Green Revolution.

These studies showed farmer education was positively correlated with adoption of new seed varieties.
Education also positively correlated with rural-urban migration when urban labor demand rises.

RoR higher (9.9% vs 6.4%, Fig 4.1) in countries with more ‘economic freedom’, i.e., with fewer restrictions on mobility, trade, entry or price controls.
Cognitive skills (e.g. literacy) matters, rather than years of schooling *per se* in Mincer regressions.

When both variables are included in the regression, literacy is the more significant determinant rather than years of schooling.

Education is an important means of acquiring cognitive skills, for most people.
Strong relation between education and literacy: Figure 4.2

95% confidence intervals for percent literate:
- 7-25% for those with no education
- 35-85% for those with 1 year of schooling
- 58-95% for those with 2 years
- 80-99% for those with 3 years
- 90-99% for those with 4 years
- 97-99% for those with 5 years

Implication: universal literacy will require universal primary schooling
Primary versus Secondary versus Tertiary Education

- Varying estimates of benefits to primary, secondary and tertiary education, but within a range of 7-15%.
- Costs vary far more: secondary/tertiary education costs 2/34 times as much as primary education.
- Implies higher net benefit of primary education.
- Rationale for MDG of universal primary education.
- Recent research indicating even higher returns to early-childhood interventions (pre-school).
Need for Govt Interventions: Social versus Private Returns

Range of external social benefits from increased schooling:
- lower fertility rates
- improved health
- benefits for children
- lower crime, drug problems
- improved civic sense

External costs? Lower earnings of already educated
Need for Govt Interventions: Missing Financial Markets

- Additional reason for underinvestment in education: parents are credit-constrained, cannot borrow to pay for children’s education
- Particularly for poor parents, sacrifice involved (in terms of foregone consumption) can be very large:
- ‘Affordability’ problems, importance of transitory income shocks (eg., natural disasters, pensions, price changes) esp in LDCs
Need for Govt Interventions: Missing Financial Markets, Equalizing Opportunity

- Immediate costs versus distant, uncertain rewards
- Missing insurance markets; low risk-bearing capacity of poor households
- Many smart children from poor households unable to get same opportunities as those from rich backgrounds
- Enhanced social mobility and equality of opportunity: additional goals of education policy
Building New Schools, versus Reducing Dropouts

- Excluding China, E Europe, C. Asia (where percent not completing 5th grade is below 5%), 30% of children in LDCs fail to complete grade 5 (41% in Africa, 32% in S Asia): Table 4.2
- Of these 55% started school but dropped out before completing 5th grade
- Orazem *et al* argue its more cost-effective to reduce drop-outs than to try to build new schools to reduce numbers of those who never attend school
- Capitalize on existing school capacity, parent willingness to send kids to school
What Kinds of Interventions will be Most Effective?

- Supply-side Interventions: building more schools, distributing free textbooks, spending more on teachers, enhancing teacher incentives, school management reforms
- Demand-side interventions: lowering schooling costs, health/nutritional supplements, conditional cash transfers (CCTs)
Stated Reasons For Not Attending School

- World-wide averages (Table 4.3):
  - Lack of interest: 47-44%
  - Poverty: 18%
  - Work: 15%
  - Health reasons: 6-5%
  - Inadequate school supply: 2-5%
  - Other: 11-12%
Effectiveness of Supply-Side Interventions: Evidence

- Indonesian school construction program during 1970s: 3% increase in average years of schooling (Duflo 2001)
  - (Duflo study provides IV/DoD estimate of returns to schooling: 10% versus OLS estimate of 7%)
- Distance to schools: negligible impacts on years of schooling (Filmer 2004)
- RCEs in Kenya distributing textbooks (Glewwe et al 2009): zero average effect
Effectiveness of Supply-Side Interventions: Teachers

- Teacher attributes matter, but these are unrelated to training or pay
- Govt school teachers are paid 2 to 8 times what private school teachers are paid in most LDCs, with little difference in teaching quality
- Why?
Govt teachers better qualified on average (more technical training in education and pedagogy)

Higher rates (20%) of teacher absenteeism in public schools with high pay (Chaudhry et al 2006)

Absenteeism difficult to control owing partly to strong teacher unions in public schools
Effectiveness of Supply-Side Interventions: Privatization

- Recent attempts to allow parents to switch their children to private schools using education vouchers (e.g. Chile, Bolivia, Colombia, Pakistan): no significant improvements overall.
- E.g. in Pakistan’s LEAPS program: poorly performing public schools that improved their quality; highly performing private schools that raised their prices; no changes for others.
- Tendency towards greater inequality (good private schools tend to accept children with above average grades and parental background).
Effectiveness of Supply-Side Interventions: Decentralizing School Management

- School management reforms (e.g., decentralization to local governments, PTAs): small, uneven benefits in Latin America
- Brazil, Colombia: no improvement in test scores, increased enrollment of students from poor households (Madeira, Rodriguez 2008)
- Argentina: schools with better pre-reform performance improved considerably, while in below-average schools performance fell (Galiani et al 2006)
Supply-Side Interventions: In-Kind Benefits for School Children

- Nutritional supplements (e.g., mid-day meals, school breakfasts)
- Immunization programs
- Bicycles for school-going girls in Bihar
Supply-Side Interventions: In-Kind Benefits for School Children, contd.

- Early childhood interventions: pre-school programs, day care, child nutrition
- Numerous studies evaluating effects on cognitive development, school enrollment, nutrition
- Emerging consensus that these are more effective than schooling interventions in later years
Orazem et al argue that demand-side interventions have been more effective in increasing enrollment.

Two (not three) categories of demand-side interventions:

- subsidizing school costs
- conditional cash transfers (CCTs)
School Cost Subsidies

- **Free Primary Schooling:** increasing trend towards making primary schooling tuition-free (75/93 countries reviewed)
- Large positive effects on enrollment amongst girls, and children from poor and rural households
- E.g., Colombia Gratuidad program: 3-6% enrollment rate effects at pre-secondary level; Fafchamps-Minten study of Madagascar natural experiment
School Cost Subsidies, contd.

- Effects of abolishing primary school tuition in Uganda in 1997: Deininger (2003) estimated reduction in schooling cost was 60% ($16), associated with 60% rise in enrollment;
- Subsequent DoD and IV estimates (Nishimura et al 2008) show significant causal impact on enrollment and 5th grade completion rates for girls and rural children
- Kenya RCE study by Kremer et al (2003): 15% enrollment increase following textbook/uniform subsidies worth $15 per child (but no effects on test scores)
Conditional Cash Transfers (CCTs)

- Large cash transfers to parents, conditional on sending children to school and medical check-ups
- Originally in Latin America (since 1995), following Mexico’s PROGRESA/OPPORTUNIDADES program
- Spreading now elsewhere: World Bank $2.8 billion program for CCTs in Bangladesh, Pakistan, Kenya, Philippines (since 2009)
- Large scale of these programs: national programs in Mexico (5 million households), Brazil (Bolsa Familia: 11 million), Colombia (1.5 million)
 CONDITIONAL CASH TRANSFERS: REDUCING PRESENT AND FUTURE POVERTY

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Figure 1  CCTs in the World, 1997 and 2008

1997

2008

Table 1 presents a partial list of the CCT programs considered in this report. The list is not exhaustive in that it does not cover all existing programs. There are additional programs in operation for which little information was available, and some programs fit the CCT label less well than do others.
### Table 3  Impact of CCTs on Poverty Measures, Various Years

<table>
<thead>
<tr>
<th>Poverty measure</th>
<th>Colombia</th>
<th>Honduras</th>
<th>Mexico</th>
<th>Nicaragua</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headcount index</td>
<td>Control</td>
<td>0.95</td>
<td>0.90</td>
<td>0.88</td>
</tr>
<tr>
<td></td>
<td>Impact</td>
<td>A</td>
<td>−0.03*</td>
<td>A</td>
</tr>
<tr>
<td>Poverty gap</td>
<td>Control</td>
<td>0.58</td>
<td>0.54</td>
<td>0.49</td>
</tr>
<tr>
<td></td>
<td>Impact</td>
<td>A</td>
<td>−0.07**</td>
<td>A</td>
</tr>
<tr>
<td>Squared poverty gap</td>
<td>Control</td>
<td>0.53</td>
<td>0.43</td>
<td>0.30</td>
</tr>
<tr>
<td></td>
<td>Impact</td>
<td>A</td>
<td>−0.02**</td>
<td>A</td>
</tr>
</tbody>
</table>

Source: Authors’ calculations.

*Significant at the 10 percent level.
**Significant at the 5 percent level.
CCT Impacts

- PROGRESA phased in a randomized manner at village level to allow evaluation of impacts
- Reduced drop-out rates in 6th and 7th grades in Mexico by 9%, in Cambodia by 11%
- Transfers provided income security of poor households, reduced child labor, child health benefits
- Well targeted: benefits largest for poorest households; minimum scope for political manipulation
<table>
<thead>
<tr>
<th>Country</th>
<th>Program</th>
<th>Age/Gender/Grade</th>
<th>Baseline enrollment (%)</th>
<th>Impact&lt;sup&gt;a&lt;/sup&gt;</th>
<th>Transfer (% of PCE)&lt;sup&gt;b&lt;/sup&gt;</th>
<th>Evaluation method</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Latin American and Caribbean countries</strong></td>
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<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Chile</td>
<td>Chile Solidario</td>
<td>Ages 6–15</td>
<td>60.7</td>
<td>7.5***</td>
<td>7</td>
<td>RDD</td>
<td>Galasso (2006)</td>
</tr>
<tr>
<td>Colombia</td>
<td>Familias en Acción</td>
<td>Ages 8–13</td>
<td>91.7</td>
<td>2.1**</td>
<td>17</td>
<td>PSM, DD</td>
<td>Attanasio, Fitzsimmons, and Gómez (2005)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ages 14–17</td>
<td>63.2</td>
<td>5.6***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecuador</td>
<td>Bono de Desarrollo Humano</td>
<td>Ages 6–17</td>
<td>75.2</td>
<td>10.3**</td>
<td>10</td>
<td>IV, randomized</td>
<td>Schady and Araujo (2008)</td>
</tr>
<tr>
<td>Honduras</td>
<td>Programa de Asignación Familiar</td>
<td>Ages 6–13</td>
<td>66.4</td>
<td>3.3***</td>
<td>9</td>
<td>Randomized</td>
<td>Glewwe and Olinto (2004)</td>
</tr>
<tr>
<td>Jamaica</td>
<td>Program of Advancement through Health and Education</td>
<td>Ages 7–17</td>
<td>18 days&lt;sup&gt;c&lt;/sup&gt;</td>
<td>0.5**</td>
<td>10</td>
<td>RDD</td>
<td>Levy and Ohls (2007)</td>
</tr>
<tr>
<td>Mexico</td>
<td>Oportunidades</td>
<td>Grades 0–5</td>
<td>94.0</td>
<td>1.9</td>
<td>20</td>
<td>Randomized</td>
<td>Schultz (2004)</td>
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<tr>
<td></td>
<td></td>
<td>Grade 6</td>
<td>45.0</td>
<td>8.7***</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Grades 7–9</td>
<td>42.5</td>
<td>0.6</td>
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<tr>
<td>Nicaragua</td>
<td>Atención a Crisis</td>
<td>Ages 7–15</td>
<td>90.5</td>
<td>6.6***</td>
<td>18</td>
<td>Randomized</td>
<td>Macours and Vakis (2008)</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>Red de Protección Social</td>
<td>Ages 7–13</td>
<td>72.0</td>
<td>12.8***</td>
<td>27</td>
<td>Randomized</td>
<td>Maluccio and Flores (2005)</td>
</tr>
</tbody>
</table>
Table 4  continued

<table>
<thead>
<tr>
<th>Country</th>
<th>Program</th>
<th>Age/Gender/ Grade</th>
<th>Baseline enrollment (%)</th>
<th>Impacta</th>
<th>Transfer (% of PCE)b</th>
<th>Evaluation method</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non–Latin American and Caribbean countries</strong></td>
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</tr>
<tr>
<td>Bangladesh</td>
<td>Female Secondary School Assistance Program</td>
<td>Ages 11–18 (girls)</td>
<td>44.1</td>
<td>12.0**</td>
<td>0.6</td>
<td>FE</td>
<td>Khandker, Pitt, and Fuwa (2003)</td>
</tr>
<tr>
<td>Cambodia</td>
<td>Japan Fund for Poverty Reduction</td>
<td>Grades 7–9 (girls)</td>
<td>65.0</td>
<td>31.3***</td>
<td>2–3</td>
<td>DD</td>
<td>Filmer and Schady (2008)</td>
</tr>
<tr>
<td>Cambodia</td>
<td>Cambodia Education Sector Support Project</td>
<td>Grades 7–9</td>
<td>65.0</td>
<td>21.4***</td>
<td>2–3</td>
<td>RDD</td>
<td>Filmer and Schady (2009c)</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Punjab Education Sector Reform Program</td>
<td>Ages 10–14 (girls)</td>
<td>29.0</td>
<td>11.1***</td>
<td>3</td>
<td>DDD</td>
<td>Chaudhury and Parajuli (2008)</td>
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<tr>
<td>Turkey</td>
<td>Social Risk Mitigation Project</td>
<td>Primary school</td>
<td>87.9</td>
<td>–3.0*</td>
<td>6</td>
<td>RDD</td>
<td>Ahmed et al. (2007)</td>
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<tr>
<td></td>
<td></td>
<td>Secondary school</td>
<td>39.2</td>
<td>5.2</td>
<td>n.a.</td>
<td></td>
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</tr>
</tbody>
</table>

* Signifcant at the 10 percent level.
** Signifcant at the 5 percent level.
*** Signifcant at the 1 percent level.

Note: DD = difference-in-differences; DDD = difference-in-difference-in-differences; FE = fixed effects; IV = instrumental variables; n.a. = not available; PCE = per capita expenditure; PSM = propensity score matching; RDD = regression discontinuity design. This table contains unweighted means for the coefficients for Colombia ages 8–13 and 14–17, Chile ages 4–5 and 6–15, and Mexico grades 0–5 and 7–9. The standard errors in each case are the square roots of the averaged variances of these estimates.

a. The column for “impact” reports the coefficient and standard error (in parentheses); the unit is percentage points, with the exception of the Jamaican PATH program, where the unit is days.
b. The transfer amounts as a proportion of per capita expenditures (or consumption) are not the same across all tables in the report because of differences in the surveys used, including their coverage and year.
c. Impacts were measured in Jamaica only for student attendance over a 20-day reference period. The baseline enrollment rate prior to PATH was 96 percent.
OVERVIEW

reductions in preexisting disparities in access to education and health. In Bangladesh, Pakistan, and Turkey, where school enrollment rates among girls were lower than among boys, CCTs have helped reduce this gender gap. In Cambodia, the JFPR program eliminated sharp socioeconomic gradients in enrollment among eligible households—although the coverage of the program was quite small. And in Nicaragua, the CCT impact on both school enrollment and growth monitoring was largest among extremely poor households, as shown in Table 5.

### Table 5  Impact of CCTs on Health Center Visits by Children, Various Years

<table>
<thead>
<tr>
<th>Country</th>
<th>Program</th>
<th>Outcome</th>
<th>Age range (years)</th>
<th>Baseline level (%)</th>
<th>Impact</th>
<th>Transfer (% of PCE)</th>
<th>Evaluation method</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chile</td>
<td>Chile Solidario</td>
<td>Regular checkups</td>
<td>0–6</td>
<td>17.6</td>
<td>2.4</td>
<td>7</td>
<td>RDD</td>
<td>Galasso (2006)</td>
</tr>
<tr>
<td>Colombia</td>
<td>Familias en Acción</td>
<td>Child taken to growth and development monitoring</td>
<td>0–1</td>
<td>n.a.</td>
<td>22.8***</td>
<td>17</td>
<td>PSM, DD</td>
<td>Attanasio et al. (2005)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2–4</td>
<td>n.a.</td>
<td>33.2***</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td>4+</td>
<td>n.a.</td>
<td>1.5*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ecuador</td>
<td>Bono de Desarrollo Humano</td>
<td>Child had growth control in last 6 months</td>
<td>3–7</td>
<td>n.a.</td>
<td>2.7</td>
<td>10</td>
<td>R</td>
<td>Paxson and Schady (2008)</td>
</tr>
<tr>
<td>Honduras</td>
<td>Programa de Asignación Familiar</td>
<td>Child taken to health center at least once in past month</td>
<td>0–3</td>
<td>44.0</td>
<td>20.2***</td>
<td>9</td>
<td>R</td>
<td>Morris, Flores, et al. (2004)</td>
</tr>
<tr>
<td>Jamaica</td>
<td>Program of Advancement through Health and Education</td>
<td>Number of visits to health center for preventive reasons in past 6 months</td>
<td>0–6</td>
<td>0.205</td>
<td>0.278***</td>
<td>10</td>
<td>RDD</td>
<td>Levy and Ohls (2007)</td>
</tr>
<tr>
<td>Mexico</td>
<td>Oportunidades</td>
<td>Number of visits to all health facilities in past month</td>
<td>0–2</td>
<td>0.219</td>
<td>-0.032</td>
<td>20</td>
<td>R</td>
<td>Gertler (2000)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>3–5</td>
<td>0.221</td>
<td>0.027</td>
<td></td>
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</tbody>
</table>
Turning to education outcomes, adults with more exposure to the Oportunidades program in Mexico have completed more years of schooling than have those with less exposure; however, the likely increase in wages that can be expected to occur because of this added schooling is small. Also, a number of evaluations have concluded that the higher enrollment levels have not resulted in better performance on achievement tests, even after accounting for selection into school. This pattern of program effects—increases in enrollment, without more learning—is not particular to CCTs. Nevertheless, the results are sobering because they suggest that the potential for CCTs to improve learning on their own may be limited. The evidence is somewhat more encouraging regarding the impact of CCT programs on cognitive development in early childhood (Macours, Schady, and Vakis 2008; Paxson and Schady 2008). This suggests that very early intervention might produce larger payoffs than one would expect, for example, by looking at the pattern of program effects on school enrollment by age or school grade.

There are various reasons why CCTs may have had only modest effects on “final” outcomes in education and health. One possibility is that some important constraints at the household level are not addressed by CCTs as currently designed; these constraints could include poor parenting practices, inadequate information, or other inputs into the production of education and health. Another possibility is that the quality of services is so low, perhaps especially for the poor, that increased use alone does not yield large benefits.

Figure 4 Heterogeneity of Impacts by Socioeconomic Status, Nicaragua, 2000

Source: Maluccio and Flores 2005.
Benefits vs. Costs of Different Interventions

- CCTs have been very large interventions, with large effects and large costs
- Table 4.5 in Orazem at al: Mexico Progresa benefit $17565, cost $2585; Nicaragua benefit $5920, cost $1574
- Compare with vouchers in Colombia: benefit $476, cost $193; scholarships in Pakistan benefit $3924, cost $108
- Magnitude of net benefits higher for CCTs, benefit-cost ratio higher for other interventions
Qualification Concerning Policies Raising Enrollment Rates in Public Schools

- Creates overcrowding in public schools
- Negative spillover effects on already-enrolled
- Overcrowding creates negative effects on quality of education: *big concern now*
- Orazem et al suggest vouchers for private schools as a solution
- Most interventions have not increased test scores of children, or quality of education
Emerging Focus of Educational Policy

- Considerable success in raising primary school enrollments world-wide as a result of concerted policy efforts
- Main concern now if how to improve quality of education
- Many experts are recommending going back to supply side interventions, to improve school quality
- Also on pre-school and early childhood interventions