THE ECONOMICS OF CHILD LABOR: AN EMPIRICAL INVESTIGATION

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Children work more in poor countries

Will work decline with poverty?

- The problem of evidence
  - Children are less apt to work in richer households
    - Behrman and Knowles 2001; Dammert 2006; Dammert 2008; Edmonds 2006; Edmonds, Pavcnik, and Topalova 2008; Wahba 2006
  - Children becomes less likely to work as households grow richer
  - But not always
    - Basu, Das, Dutta 2007; Fafchamps and Wahba 2006; Kruger 2007; Manacorda and Rosati 2007; Mueller 1984; Rosenzweig and Evenson 1977; Schady 2004
  - Attributing causation is difficult: child time allocation and family living standards are joint outcomes of one decision-making process
Theory has strong implications

- The conical model is Basu & Van (AER, 1998)
- Child and adult labor are perfect substitutes subject to a productivity shifter
- The absence of child labor is a luxury that can be realized when families cover their subsistence needs.
  - Much stronger than just an income elasticity of child labor supply
- Together, the raise the possibility of:
  - Child labor as a coordination failure
  - Extremely large adult income elasticities of child labor supply in the neighborhood of perceived subsistence
    - Other factors important outside of that neighborhood
This study

- Review of the Basu-Van Model
- Discuss its implications for household responses to cash transfer programs
- Evidence from Ecuador
  - Randomized field experiment in Ecuador
    - $15/month on randomly selected households
    - 1/10 of monthly income for recipients
  - Declines in paid employment concentrated at school transition ages
    - Total household expenditures decline because of decline in paid employment
The Basu and Van Model

- A review
Can I afford for my child to not work?

- 1 child, 1 decision-maker
- The Luxury Axiom
  - Lexicographic preferences
  - Can I afford NOT to send my child away for work?
  - $c$ is consumption, $s$ is perceived basic needs

\[
\begin{align*}
(c_i, 0) &> (c_i + \delta, 1) \text{ if } c_i \geq s_i \\
(c_i + \delta, 1) &> (c_i, 0) \text{ if } c_i < s_i
\end{align*}
\]
Children work when their family income (absent child labor) is too low

- The substitution axiom: child and adult labor are perfect substitutes subject to a productivity shifter,
  \[ \alpha < 1 \Rightarrow w_c = \alpha w_A \]

- The budget constraint: \[ c_i \leq e_i \alpha w_A + w_A + t_i \]

- Consumption:
  \[ c_i = \begin{cases} (w_A + t_i) & \text{if } w_A + t_i \geq s_i \\ \left( (1 + \alpha) w_A + t_i \right) & \text{if } w_A + t_i < s_i \end{cases} \]

- Child labor:
  \[ e_i = \begin{cases} 0 & \text{if } w_A + t_i \geq s_i \\ 1 & \text{if } w_A + t_i < s_i \end{cases} \]
Empirical Implications of Basu and Van

- The impact of an increase in income depends on how close the family is to subsistence absent the child’s contribution
  - Child’s time allocation is revelatory
  - Increases in non-child labor income can lead to declines in income
- Perceptions of subsistence are important
  - Expect to have some distribution in the population
  - What goes into them?
    - Costs of alternative uses of child time
    - Greatest response at normal school transition ages
‘The Economics of Child Labor’ in Ecuador

Testing these predictions in family responses to a cash transfer program in Ecuador
Time allocation by age in Ecuador: June – August 2003

Growth in paid employment starts at ages when schooling declines

Data: BDH Evaluation Baseline
Annual school expenditures by student age

Schooling costs increase dramatically at the end of primary

Data from BDH baseline survey (avg. annual income in treated pop is $2000)
Paid employment (away from home) is ‘child labor’ in this context

- Why is paid work different in Ecuador?
  - Hours do not appear flexible (8, 40, and 60 / wk)
  - Is rarely combined with schooling
    - 3 in 20 also attend school
    - 12 in 20 in family market work also attend school
    - Across countries, can be explained by greater total hours worked
  - School re-entry is rare
    - In the control population, 10 percent of children out of schooling and working at baseline re-enter school in the follow-up
The experiment

- **Bono de Desarrollo Humano (BDH) in Ecuador**
  - Starting in 2001 – Ecuador invests in creating a Selben Index
    - Bottom two quintiles of population eligible for BDH
  - $15/month per eligible family (1/10 of monthly income for recipients, GNI per month per capita is $720)
  - BDH gets underway in 2003
  - Very important – launched with a social marketing campaign about the import of human capital investments

- **The evaluation: in 4 provinces, BDH allocated randomly to eligible households for purpose of evaluation**
  - Randomization is at the household level (balanced)
  - BDH is an unconditional cash transfer (with social marketing)
  - Baseline data collected in June – August 2003
  - Follow-up collected 1.5 years later on average
### Child time allocation at baseline

No substantive or significant differences between treatment and control

Our focus will be on 10+ and paid market work

<table>
<thead>
<tr>
<th>Variable</th>
<th>Treatment</th>
<th>Control</th>
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<tbody>
<tr>
<td>Enrolled in School</td>
<td>0.71</td>
<td>0.71</td>
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<tr>
<td>Highest Grade Completed</td>
<td>5.67</td>
<td>5.60</td>
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<tr>
<td>Any Market Work</td>
<td>0.52</td>
<td>0.51</td>
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<tr>
<td>Paid Market Work</td>
<td>0.12</td>
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<tr>
<td>Unpaid market work</td>
<td>0.43</td>
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<tr>
<td>Domestic Work</td>
<td>0.82</td>
<td>0.83</td>
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<tr>
<td>Works without school</td>
<td>0.27</td>
<td>0.28</td>
</tr>
<tr>
<td>Sample Size</td>
<td>1083</td>
<td>994</td>
</tr>
</tbody>
</table>
The experiment

- Take-up is imperfect
  - Winning the lottery doubles the probability of receipt of the transfer, but there is considerable leakage.
- Attrition is low and uncorrelated with the lottery
  - 94.1 percent of households recaptured at follow-up
  - Focus on follow-up sample (effectively, a balanced panel)
- Other studies of the BDH experiment
  - Paxson & Schady (2008) – preschool nutrition
  - Schady & Rosero (2008) – food in preschool sample
  - Schady & Araujo (2007) – school enrollment
Implications of Basu and Van in Ecuador

- The impact of an increase in income depends on how close the family is to subsistence absent the child’s contribution
  - Child’s time allocation at baseline is revelatory
    - With rising subsistence costs with age, children working at baseline are unlikely to be affected by the transfer

- The response to an increase in income is largest at school transition ages
  - Students in school at near end of primary school most apt to be affected
    - Starting at age 12 (age 10 at baseline)

- Additional adult or transfer income can lead to declines in total family income

- Discussion and analysis will assume no general equilibrium effects or spillovers on local labor markets
Main findings

- At school to work transition ages, market work and work for pay decline with additional income
- Schooling expenditures increase but total expenditures do not in this population
Paid employment by treatment status and PCX

Paid employment participation rate in follow-up plotted against log per capita expenditures at baseline. “Treat” refers to BDH lottery winners, “Control” to losers.
Decline in paid employment participation rate

Pr[e(t)=1|PCX(t-1),D=0] - Pr[e(t)=1|PCX(t-1), D=1]
Difference in Baseline Paid Employment Partic Rate

LN PCX Baseline

Difference by treatment status is not in baseline

Pr[\text{e}(t-1)=1|\text{PCX}(t-1), D=0] - Pr[\text{e}(t-1)=1|\text{PCX}(t-1), D=1]
Identifying marginal children

- Children 10 and above with high predicted probability of transitioning from school to paid employment
  - Restrict sample to control population
  - Block full sample on predicted probability of transitioning to paid work

\[ \hat{e}_{ip1} = \alpha + \lambda_{p1} + \lambda_{a1} + \beta g_i + \dot{E}_{i0} + \pi \left( PCX_{i0} \ast a_{i1} \ast g_i \right) \]

- In text (not in presentation):
  - Full sample
  - Stratify by baseline characteristics
    - Age 10+ at baseline (follow-up is 1.5 years after baseline)
    - Age 10+ nearing end of primary school
    - Age 10+ not in paid employment at baseline
Empirical Methods

\[ e_{ip} = \alpha + \lambda_p + \lambda_a + \beta g_i + \gamma r\hat{t}_i + \varepsilon_{ip} \]

- Adult wages in the local labor market – captured by parish fixed effects
- Maintenance and education costs vary by age and gender
  - Gender effect
  - Age dummies
- Standard errors clustered by parish
- Targeting errors – instrument for take-up with lottery award
  - Take-up is not random
    - 39 percent of ineligible households receive the transfer
    - 68 percent of lottery winners take-up the transfer
  - Use lottery assignment as instrumental variable for take-up decision
  - Reduced forms in text
### Impact of BDH on child labor and spending

**Children 10 and older at baseline**

Instrumental variables results. Each cell is from a different regression. Standard errors in parenthesis. Tables 7 and 9 in paper.

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<tbody>
<tr>
<td><strong>Highest probability of transitioning from schooling to paid employment (692 children)</strong></td>
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<tr>
<td>Receives BDH (2SLS)</td>
<td>-0.245*</td>
<td>-0.365**</td>
<td>0.00634</td>
<td>0.121</td>
<td>0.426**</td>
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<td>(0.134)</td>
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<td><strong>Middle third of transition probabilities (692 children)</strong></td>
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<td>Receives BDH (2SLS)</td>
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<td><strong>Lowest transition probability (693 children)</strong></td>
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<td>Receives BDH (2SLS)</td>
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Average wage for working children is $84/month
- 0.37*84 = $31 foregone income per month
- 1.8 children per household * $31 = $56 foregone per month
- $56-$15 = $41 per month decline
- $430/12 = $36 per month actual

Impact of **BDH** on child labor and spending

**Children 10 and older at baseline**

Instrumental variables results. Each cell is from a different regression. Standard errors in parenthesis. Tables 7 and 9 in paper.
Summary

- Bono de Desarrollo Humano (BDH) in Ecuador
  - $15/month, 1/10 monthly income for recipients
- Negligible effects on time allocation for the young or those already out of school at baseline
- Large effects on paid employment for children vulnerable to transitioning from school to work
  - Families appear to use almost entire transfer to maintain schooling between primary and secondary
  - Schooling expenditure rise absorb most of transfer
  - Total expenditures fall because of the loss of child labor income
    - Average wage for working children is $84/month
    - Probability works for pay declines by 37 percentage points
    - $31 foregone income per child
    - 1.8 children per household, $56 in foregone income per month
    - $56-$15 = $41 per month decline
    - Data suggest decline is $36 per month
Summary

- **Bono de Desarrollo Humano (BDH) in Ecuador**
  - $15/month, 1/10 monthly income for recipients
  - Large effects on paid employment for children vulnerable to transitioning from school to work
- **Results consistent with predictions of Basu & Van model**
  - Why?
    - Basu and Van - Preferences & income change
    - Is the transfer transitory or permanent?
    - Social marketing campaign change perceptions of subsistence
- **Lessons**
  - Suggests small, well-targeted transfers can have large effects on child labor and schooling
  - Transfer does not need to fully cover direct and opportunity costs to have an effect
  - Experiment with size of transfer, explicitly test conditionality, marketing message, etc.