The Long-Run Impacts of the Graduation Program in Ethiopia and Ghana

Nate Barker

with Abhijit Banerjee (MIT), Dean Karlan (Northwestern), Robert Osei (ISSER), Isaac Osei-Akoto (ISSER), Chris Udry (Northwestern), Kelsey Wright (PSE)

December 4, 2020
Today’s Context and Roadmap

- This presentation: Long-run results from original multi-country CGAP pilot sites (discussed in Banerjee et al 2015): 7-years in Ethiopia, 8-years in Ghana

Today:
1. Brief context and top-level results from 7/8 years
2. Unpack what aspects of household economic activities are changing
3. Consider what we can learn about asset-based poverty traps
Top-Level Results

- Previous results: three years after roll-out of program, large economic effects in both Ethiopia and Ghana
  
- By year 7 in Ethiopia, results have faded, but are still largely positive; continue to be treatment effects on consumption (0.13 SDs; +8%), assets (0.31 SDs; +24%)
  
- By year 8 in Ghana, we are unable to reject that treatment and control are equal on most domains (possibly some small differences still on asset ownership)
  
- In both countries, growing variance on financial economic outcomes
Setting: Ethiopia

- 925 Households chosen in 10 villages through Productive Safety Net Programme (workfare program) in Tigray Region, Ethiopia
- Livelihoods: sheep and goats (62%), oxen (24%), bees (10%), petty trade inputs (4%)
- Key aspect of promoted livestock activities: buy, fatten (through molasses, feed), re-sell
- Ethiopian government: need to save initial size of asset transfer (≈400 USD PPP) before accessing, using savings (stored at bank account in nearby town)
### Ethiopia: Indexed Household Outcomes

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ITT: Two Year</strong></td>
<td>0.239*** (0.07)</td>
<td>0.769*** (0.08)</td>
<td>1.409*** (0.16)</td>
<td>1.851*** (0.12)</td>
<td>0.139** (0.06)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ITT: Three Year</strong></td>
<td>0.347*** (0.07)</td>
<td>0.813*** (0.08)</td>
<td>0.459*** (0.07)</td>
<td>0.781*** (0.11)</td>
<td>0.186*** (0.06)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ITT: Seven Year</strong></td>
<td>0.134** (0.07)</td>
<td>0.306*** (0.07)</td>
<td>0.07 (0.07)</td>
<td>0.01 (0.06)</td>
<td>0.04 (0.07)</td>
</tr>
</tbody>
</table>

- For bottom 99% of distribution, still positive ITTs on saving (+72%)
ETH: Shoat Sales in Last 12 Months, by Year

2 Year

3 Year

7 Year

Sheep and Goat Sales
Sheep and Goat Purchases

ETH: Shoat Purchases in Last 12 Months, by Year

2 Year

3 Year

7 Year

Number of Shoats Bought

Percentile

Treatment
Control

Treatment
Control

Treatment
Control
ETH: Current Number of Shoats Owned

2 Year

3 Year

7 Year
Sheep and Goats: Any sales

- Control
- Treatment

- Sold sheep, 2 yr
- Sold sheep, 3 yr
- Sold sheep, 7 yr
Sheep and Goats: Owns Any

![Bar chart showing the comparison between sheep ownership in control and treatment groups over different years.](chart.png)

- **Control**
  - Has sheep, 2 yr: 0.2
  - Has sheep, 3 yr: 0.4
  - Has sheep, 7 yr: 0.6

- **Treatment**
  - Has sheep, 2 yr: 0.2
  - Has sheep, 3 yr: 0.6
  - Has sheep, 7 yr: 0.8
## Ethiopia: Agricultural Outcomes

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hectares Cultivated</td>
<td>Value of Harvest (USD PPP)</td>
<td>Agricultural Expenses (USD PPP)</td>
<td>Net Agricultural Profits (USD PPP)</td>
</tr>
<tr>
<td><strong>ITT: Two Year</strong></td>
<td>0.0734**</td>
<td>91.72***</td>
<td>40.23***</td>
<td>51.49**</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(26.54)</td>
<td>(11.57)</td>
<td>(23.13)</td>
</tr>
<tr>
<td>Control mean</td>
<td>0.58</td>
<td>374.10</td>
<td>117.50</td>
<td>256.60</td>
</tr>
<tr>
<td><strong>ITT: Three Year</strong></td>
<td>0.0932***</td>
<td>102.4***</td>
<td>30.12***</td>
<td>72.33***</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(27.49)</td>
<td>(8.37)</td>
<td>(24.75)</td>
</tr>
<tr>
<td>Control mean</td>
<td>0.63</td>
<td>433.70</td>
<td>75.91</td>
<td>357.70</td>
</tr>
<tr>
<td><strong>ITT: Seven Year</strong></td>
<td>0.0923***</td>
<td>67.11**</td>
<td>30.20***</td>
<td>36.91</td>
</tr>
<tr>
<td></td>
<td>(0.03)</td>
<td>(33.81)</td>
<td>(10.64)</td>
<td>(28.66)</td>
</tr>
<tr>
<td>Control mean</td>
<td>0.58</td>
<td>442.80</td>
<td>169.20</td>
<td>273.60</td>
</tr>
</tbody>
</table>
2600 households across 154 villages, three (mostly) rural stations in Northern, Upper East, Ghana

94% of households engaged in agriculture at baseline

Program explicitly targeted to women

Productive asset transfers involved pairs of enterprises; most common pairs were:

1. 4 goats and 4 hens (45%)
2. 4 goats and inputs for one acre of maize (27%)
3. 4 hens and bag of shea nuts (6%)

In total, 75% of households received 4 goats, 64% received 4 hens, 37% received maize inputs
## Ghana Average Treatment Effects

### Ghana: Index Household Outcomes

<table>
<thead>
<tr>
<th></th>
<th>(1) Per Capita Consumption, Standardized</th>
<th>(2) Asset Index</th>
<th>(3) Income and Revenues Index</th>
<th>(4) Financial Inclusion Index</th>
<th>(5) Food Security Index</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ITT: Two Year</strong></td>
<td>0.089* (0.05)</td>
<td>0.26*** (0.05)</td>
<td>0.17*** (0.05)</td>
<td>0.26*** (0.06)</td>
<td>0.06 (0.04)</td>
</tr>
<tr>
<td><strong>ITT: Three Year</strong></td>
<td>0.14*** (0.05)</td>
<td>0.36*** (0.06)</td>
<td>0.35*** (0.07)</td>
<td>0.35*** (0.08)</td>
<td>0.073* (0.05)</td>
</tr>
<tr>
<td><strong>ITT: Eight Year</strong></td>
<td>0.00 (0.04)</td>
<td>0.12 (0.08)</td>
<td>0.06 (0.06)</td>
<td>-0.01 (0.04)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>ITT: Eight Year</strong></td>
<td>66.03</td>
<td>28.29**</td>
<td>37.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(101.10)</td>
<td>(11.80)</td>
<td>(97.98)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control mean</td>
<td>443</td>
<td>142</td>
<td>301</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Ghana: Livestock Ownership**

<table>
<thead>
<tr>
<th>Total Livestock Value, USD PPP</th>
<th>Value of Goats and Chickens, USD PPP</th>
<th>Value of Other Livestock, USD PPP</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ITT: Eight Year</strong></td>
<td>66.03</td>
<td>28.29**</td>
</tr>
<tr>
<td></td>
<td>(101.10)</td>
<td>(11.80)</td>
</tr>
<tr>
<td>Control mean</td>
<td>443</td>
<td>142</td>
</tr>
</tbody>
</table>
## Ghana Asset Ownership

<table>
<thead>
<tr>
<th></th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Asset Value</strong></td>
<td>207</td>
<td>116</td>
<td>90.9**</td>
</tr>
<tr>
<td></td>
<td>(135)</td>
<td>(121)</td>
<td>(43)</td>
</tr>
<tr>
<td><strong>Observations</strong></td>
<td>2501</td>
<td>2501</td>
<td>2501</td>
</tr>
<tr>
<td><strong>R-squared</strong></td>
<td>0.135</td>
<td>0.108</td>
<td>0.152</td>
</tr>
<tr>
<td><strong>Control mean</strong></td>
<td>864</td>
<td>495</td>
<td>369</td>
</tr>
</tbody>
</table>

*Treatment (ITT): Eight Year*
Ghana: Livestock Revenue per month, by Year

2 Year

3 Year

8 Year

Ghana Livestock Revenue
Ethiopia: IHS Productive Asset CDF

ETH: 3 Year Prod Asset CDF

3-Yr CDF

3-Year IHS Prod Assets

- Treat: 3 yr CDF
- Cont: 3 yr CDF
Ethiopia: IHS Asset Transitions: 3-7 Years

ETH: 3-7 Yr Prod Asset Transition

Treat: 3-7 Transition
Cont: 3-7 Asset Transition

Treat: 3 yr CDF
Cont: 3 yr CDF
Ghana: IHS Asset Transitions: 3-7 Years

GHA: 3-7 Yr Prod Asset Transition

Treat: 3-7 Transition
Cont: 3-7 Asset Transition
Treat: 3 yr CDF
Cont: 3 yr CDF