When Is Growth Pro-Poor?
Cross-Country Evidence

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Growth (Almost) Always Reduces Poverty

\[ y = -1.16x - 0.01 \]
\[ R^2 = 0.51 \]
Plan for Presentation

1. **Definition:** *Growth is pro-poor if poverty falls*

2. **Accounting for “Sources” of PPG:** *Growth is pro-poor if:*
   - Growth is high
   - The sensitivity of poverty to growth is high
   - Relative incomes change in the “right” way

3. **Empirics:** *Use cross-country data to answer two questions:*
   - Which of the three sources of PPG matter most?
   - Which of the three sources of PPG can we “explain” with cross-country data?
Pro-Poor Growth Accounting

Poverty Measure: \[ P_t = \int_0^1 f(y_t(p)) \cdot dp \]

Change in Poverty: \[ \frac{dP_t}{dt} = \int_0^1 \eta_t(p) \cdot g_t(p) \cdot dp \]

Sensitivity of poverty measure to growth in income of percentile \( p \)

Growth in income of percentile \( p \), i.e. the “Growth Incidence Curve” of Ravallion and Chen (2002)

\[ \eta_t(p) = \frac{df(y_t(p))}{dy_t(p)} \cdot y_t(p) \]

\[ g_t(p) = \frac{dy_t(p)}{dt} \cdot \frac{1}{y_t(p)} \]

Average across all percentiles
Separating Effects of Average Income Growth

\[
\frac{dP_t}{dt} = \left( \frac{d\mu_t}{dt} \cdot \frac{1}{\mu_t} \right) \int_0^1 \eta_t(p) \cdot dp + \int_0^1 \eta_t(p) \cdot \left( g_t(p) - \left( \frac{d\mu_t}{dt} \cdot \frac{1}{\mu_t} \right) \right) \cdot dp
\]

- **Average Income Growth**
- **Average (across percentiles) sensitivity of poverty to growth in \( p^{th} \) percentile**
- **Sensitivity of poverty to growth in \( p^{th} \) percentile relative to average**
- **Growth in income of \( p^{th} \) percentile relative to average**

**Average across all percentiles**
Whose Growth Matters for Poverty Reduction?

Percentile of Income Distribution, $p$

- Headcount
- Poverty Gap
- Squared Poverty Gap
- Watts Index

Sensitivity of Poverty to Growth of Percentile $p$
Decomposing Changes in Poverty

Percentile of Income Distribution, $p$

Sensitivity of Poverty to Growth of Percentile $p$

Growth of Percentile $p$ Relative to Mean

Sensitivity of Poverty Gap To Average Growth

Headcount

Sensitivity of Poverty to Growth of Percentile $p$
Summary of Pro-Poor Growth “Accounting”

• Three potential sources of pro-poor growth
  1. Fast growth in average incomes
  2. High sensitivity of poverty to growth
  3. “Right” changes in relative incomes

1. Growth in mean is self-explanatory

2. Shape of entire initial distribution of income below poverty line matters for sensitivity of poverty to growth (except for special cases like the headcount or the Watts)

3. Changes in relative incomes that matter most for pro-poor growth depend on poverty measure of interest and shape of entire initial distribution of income below poverty line
Empirics Using Cross-Country Data

\[
\text{Change in Poverty} = \text{Growth in Average Incomes} \times \text{Sensitivity of Poverty to Growth in Average Incomes} + \text{Changes in Relative Incomes}
\]

**Option 1:** Directly construct all three terms in PPG identity:

- Growth
- Sensitivity to Growth
- “Right” weighted average of relative growth

*Use variance decompositions to summarize relative importance of each*

**Option 2:** Regress change in poverty on:

- Growth
- Growth Interacted With Initial Gini
- Change in Gini

*This amounts to estimating a (decent) approximation to an identity*
Growth (1 & 2) Versus Distributional Change (3)

\[ y = 0.98x - 0.00 \]

\[ R^2 = 0.69 \]
Average Growth (1) versus Sensitivity (2)

\[ y = 0.53x + 0.00 \]

\[ R^2 = 0.87 \]
Summary of Variance Decompositions

• Three potential sources of pro-poor growth
  1. Growth in Average Incomes
  2. Sensitivity of Poverty to Growth
  3. Change in Relative Incomes

• For the headcount, in the long run:
  – (1) and (2) together account for > 90% of variation
  – (3) accounts for < 10% of variation
  – (2) varies little across countries relative to (1)

• For more bottom-sensitive poverty measures, and over shorter spells, the share of growth is smaller, but > 60% (difference might be due to measurement error?)
Growth-Poverty Regressions

\[ d\ln P_i = \beta_0 + (\beta_1 + \beta_2 \cdot G_{0i}) \cdot d\ln y_i + \beta_3 \cdot dG_i + \epsilon_i \]

- \( d\ln P = \) Percent change in poverty
- \( d\ln Y = \) Percent change in mean income/consumption
- \( dG = \) Change in Gini
- \( G_0 = \) Initial Gini

\( \epsilon = \) Error term capturing approximation errors

- \( dG \approx \) Distribution component of changes in poverty
- \( \beta_1 + \beta_2 \cdot G_0 \approx \) Sensitivity of Poverty to Growth
Approximation 1: Gini and Sensitivity of Poverty to Growth

\[ y = 0.05x - 4.00 \]

\[ R^2 = 0.25 \]
Approximation 2: Change in Gini and Change in Poverty-Relevant Measure of Inequality

\[ y = 0.01x + 0.27 \]

\[ R^2 = 0.09 \]
### Table 1: Regressions of Poverty on Growth

*Dependent variable is average annual log change in headcount*

<table>
<thead>
<tr>
<th>Term</th>
<th>Coefficient</th>
<th>Standard Error</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant ($\beta_0$)</td>
<td>-0.01</td>
<td>(0.01)</td>
</tr>
<tr>
<td>Growth ($\beta_1$)</td>
<td>-3.46</td>
<td>(0.98)</td>
</tr>
<tr>
<td>Growth x Initial Gini ($\beta_2$)</td>
<td>4.94</td>
<td>(2.00)</td>
</tr>
<tr>
<td>Change in Gini ($\beta_3$)</td>
<td>3.35</td>
<td>(0.83)</td>
</tr>
</tbody>
</table>

*Number of Observations: 42*

*R-Squared: 0.70*
Interpreting Regression Results

• Effect of growth on poverty (at median Gini=0.43)
  – Growth = 0.0%, Poverty Reduction = 0.0%
  – Growth = 1.5%, Poverty Reduction = 2.0%
  – Growth = 4.4%, Poverty Reduction = 5.9% \(\{\text{5.9}\%\}\)

• Effect of initial inequality on poverty (at median growth = 1.5%)
  – G=0.35, Poverty Reduction = 2.6%
  – G=0.43, Poverty Reduction = 2.0%
  – G=0.50, Poverty Reduction = 1.5% \(\{\text{1.1}\%\}\)

• Effect of changes in inequality
  – dG = -0.4%, Poverty Reduction = 1.3%
  – dG = 0.1%, Poverty Reduction = -0.3%
  – dG = 0.6%, Poverty Reduction = -2.0% \(\{\text{3.3}\%\}\)
Determinants of Sources of Pro-Poor Growth?

- Huge empirical literature on determinants of growth in average incomes
- Cross-country evidence on determinants of inequality levels and changes is much more mixed
- In paper, look for determinants of:
  - growth in household survey mean (OK but not especially impressive results using “standard” growth variables)
  - changes in “right” measures of inequality (Very few significant correlates of inequality change)
Summary and Conclusions

• Growth matters a lot for poverty reduction
  – *We already knew this!*

• Value-added of “Pro-Poor” prefix to “Growth” depends on:
  – the extent to which growth and poverty reduction diverge (*on average, not that much in the long run*)
  – the extent to which we know how to affect these divergences through policy (*cross-country evidence not very informative*)

• Are debates over relative importance of sources of PPG relevant for policy at the country level?
  – Get macro/growth fundamentals right
  – Do careful analysis of micro data to understand why growth rates differ across individuals
  – Are there really many tradeoffs?