Short and Long-run Impacts of Food Price Changes on Poverty

Maros Ivanic and Will Martin*

World Bank

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*The views expressed are those of the authors alone.
Roadmap

- Impacts of high prices on poverty
- Methodology
- Results
Impacts of high food prices on poverty
75 percent of poverty is rural

- And most poor people derive their income from agriculture
  - But most poor farmers tend to be net buyers of food
- And all poor people spend a large share of their income on food
- And food price spikes are intense and hard to predict
Real wheat prices

Source: USDA. Deflated using U.S. CPI
Unanticipated high prices

- Demand can respond
  - But demand elasticities are typically very low
    - Although new work points to a quality margin of adjustment

- Production hard to adjust in the time frame of a price surge
  - Producers may take time to learn
    - May fear that high prices won’t last
  - Time needed to produce food
Are anticipated price rises a problem?

- Producers have time to respond

- If net buyers increase their output and become net sellers, perhaps they will gain?
  - But this requires a second-order effect to outweigh a first-order effect
Methodology
Top down with full household data

- Link simple household models with global and national models
  - Top down: GE → Household
- Need detailed information on households’ expenditure patterns and income sources
  - A serious constraint, as many household surveys provide only expenditure patterns
  - Can deal with cases where income and expenditures come from different surveys
- So far have 29 countries, including India
<table>
<thead>
<tr>
<th>Country</th>
<th>Year 1</th>
<th>Country</th>
<th>Year 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albania</td>
<td>2005</td>
<td>Niger</td>
<td>2007</td>
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<tr>
<td>Armenia</td>
<td>2005</td>
<td>Nigeria</td>
<td>2003</td>
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<td>Bangladesh</td>
<td>2005</td>
<td>Pakistan</td>
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<td>Belize</td>
<td>2009</td>
<td>Panama</td>
<td>2003</td>
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<td>Cambodia</td>
<td>2003</td>
<td>Peru</td>
<td>2007</td>
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<td>Côte d'Ivoire</td>
<td>2002</td>
<td>Rwanda</td>
<td>2005</td>
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<td>Ecuador</td>
<td>2006</td>
<td>Sri Lanka</td>
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<td>Guatemala</td>
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<td>Tajikistan</td>
<td>2007</td>
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<tr>
<td>India</td>
<td>2002–4</td>
<td>Tanzania</td>
<td>2008</td>
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<td>2007</td>
<td>Timor-Leste</td>
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<td>2004</td>
<td>Uganda</td>
<td>2005</td>
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<td>2009</td>
<td>Vietnam</td>
<td>2004</td>
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<td>Mongolia</td>
<td>2002</td>
<td>Yemen</td>
<td>2006</td>
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<tr>
<td>Nepal</td>
<td>2002</td>
<td>Zambia</td>
<td>2010</td>
</tr>
<tr>
<td>Nicaragua</td>
<td>2005</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Capturing household behavior

\[ B = e(p,u) - \Pi(p) - w.l - f \]

- \( e(p,u) = \) expenditure function
- \( \Pi(p) = \) revenue from household’s farm firm
- \( w.l = \) net sales of factors outside farm firm
- \( f = \) transfers to households
Why focus on farm profits rather than factor returns?

- Enables a much more detailed treatment of income sources

- Firms are competitive so factor returns exhaust the revenue
  - Can consider either farm returns or factor earnings
Short vs long run

- Short run

$$\Delta B = e_p dp - r_p dp$$

- Long run

$$\Delta B = e_p dp - r_p dp + \frac{1}{2}.(e_{pp} dp^2 + r_{pp} dp^2)$$
Diagrammatically

I\textsuperscript{st} order cost

\[ z_p \Delta p \]
Net gain to producers

Demand

Supply

Net gain to producers

$p_0$

$p_1$

0

Quantity
Net gain to consumers

Net gain to consumers

Demand
Supply

$p_0$
$p_1$

0

Quantity
Still lose even with an equal & opposite trade position
Which slopes matter?
Supply vs Demand elasticities
Experiments and Results
Short vs Long-run poverty impacts of a 10% price rise

Cattle  Fruit  Maize  Milk  Oils  Poultry  Rice  Sugar  Swine  Wheat  Total

Short Run
Long Run
<table>
<thead>
<tr>
<th>Product</th>
<th>Price Decline (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>-14.6</td>
</tr>
<tr>
<td>Grains</td>
<td>-12.5</td>
</tr>
<tr>
<td>Fruits</td>
<td>-11.5</td>
</tr>
<tr>
<td>Wheat</td>
<td>-12.6</td>
</tr>
<tr>
<td>Oils</td>
<td>-14.1</td>
</tr>
<tr>
<td>Beef</td>
<td>-15.3</td>
</tr>
<tr>
<td>Milk</td>
<td>-15.9</td>
</tr>
<tr>
<td>Sugar</td>
<td>-12.5</td>
</tr>
</tbody>
</table>
Poverty impacts of global & developing country productivity growth, % pts

![Bar chart showing the poverty impacts of global & developing country productivity growth in terms of percentage points.](chart.png)
Conclusions

- Unanticipated food price spikes seem to cause poverty to increase

- With time, the adverse impacts of higher prices are likely blunted substantially
  - But still appear to be poverty-increasing

- Lower food prices resulting from productivity growth are associated with big reductions in poverty