Do Farming Rural Households Benefit from High Food Prices? Panel Evidence from Rural Households in Ethiopia

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OUTLINE

- Background
- Methodology
- Data sources
- Results
- Summary and Conclusions
Background

- The World has experienced unprecedented increase in food prices since 2007/08 → Food and Financial crisis

- High food prices are a serious treat for many poor people in developing countries (Ivanic and Martin, 2008; Mitchell, 2008; von Braun, 2008; Loening and Oseni, 2007; Robles and Maximo, 2010; Wood et al. 2009)
  - Food accounts for more than 60% of total expenditure

- It can also represent an opportunities for those households making a living from agriculture (de Janvry and Sadoulet, 2009). Most of poor households in developing countries live in rural areas and are both producers and consumers of products.

- Transfer of income from generally richer net-food buyers to poorer net food sellers (Aksoy and Isik-dikmelik, 2008, 2009)

- High food prices have a positive impact on welfare of household at aggregate level, albeit the benefit is not evenly distributed among the population (Minot and Dewina, 2013; Ferreira et al., 2013; Vu and Glewwe, 2011; Cranfield and Haq, 2010; Tefera et al., 2012)
Background

- Agriculture is the mainstay of the Ethiopian Economy
  - It accounts for
    - 41% of GDP
    - 85% of rural employment → smallholders farming households
    - 90% of export
  - Recurrent drought
  - 6.5% growth per annum since 2003/04 (MoFED, 2011, World Bank, 2012)
  - Poverty level improved from 39.6% in 2004 to 29.6% in 2001 (World Bank, 2012)
    - Agriculture contributes for much of the growth …
Background

- ... has experienced high (food prices) inflation since early 2005

**Fig. 1: Consumer Price Index since 2004**

- Inflation since 2007/08
  - Unprecedentedly increased since 2007/08
  - Cereal inflation reach at all time high in October 2008

Source: Authors' estimation using CSA consumer price data
Background

• Real food prices significantly increase in 2009

Real prices of staples

- Real prices of teff is highest and maize is lowest
- Real cereal prices were also high in 2009/10
- Food prices are more volatile and variable

Source: Authors' estimation using CSA price data
Objectives

- Studies on impact of such price movements on welfare of rural smallholders are Ethiopia limited (Loening and Oseni; 2007; Tefera et al., 2012)
  - First order approximation of the NBR analysis \( \rightarrow \) neglect substitution effects.

- In the medium-to-long-term rising in real food prices could often accompany by changing household consumption preferences

- It would be more progressive for rural farming households as they are both producers and consumers of products.

- This study examines welfare impact of rising food prices on rural smallholders in Ethiopia using data three years and two years before and after the 2007/08 high food prices \( \rightarrow \) with impact of substitution and income effects.

- Explores impact of welfare changes on poverty at household levels.
Methodology

- Second-order Taylor Expansion of Compensating variation (CV)

\[
CV = e(p^c_0, u_0) - e(p^c_1, u_0) + \pi(p^p_1, z_1) - \pi(p^p_0, z_0)
\]  

\[
\frac{CV}{Y_0} = \sum_{i=1}^{N} s_{i0} \Delta \ln p^p_i - \sum_{i=1}^{N} q_{i0} \Delta \ln p^c_i + \frac{1}{2} \sum_{i=1}^{N} \sum_{i=1}^{N} q_{i0} \varepsilon_{ij} \Delta \ln p^c_i \Delta \ln p^c_j
\]

\[
+ \frac{1}{2} \sum_{i=1}^{N} \sum_{i=1}^{N} s_{i0} \theta_{ij} \Delta \ln p^p_i \Delta \ln p^p_j + \sum_{i=1}^{N} x_{i0} \Delta \ln z_i
\]

\[
+ \frac{1}{2} \sum_{i=1}^{N} \sum_{i=1}^{N} x_{i0} \gamma_{ij} \Delta \ln z_i \Delta \ln z_j
\]  

where:

- CV = Compensating variation
- \(Y_0\) = Base year income
- \(p^p_i\) = Producers price
- \(p^c_i\) = Consumers price
- \(\varepsilon_{ij}, \theta_{ij}\) and \(\gamma_{ij}\) are demand, supply and input elasticities, respectively
Data sources

ERHS panel data
AAU in collaboration with CSAE and IFPRI.
It is more appropriate for the analysis before and after rising food price
EHHS has been collected in seven rounds (between 1994 and 2009) from 18 villages across the country and covered 1865 households
This study uses 2004 and 2009 survey
A balanced panel with 1,476 households observed in each year
## Food accounts for the largest share of budgets (about 78%)

Table 1: food budgets share, purchase and sales share in total food exp.

<table>
<thead>
<tr>
<th>Food share in total HH budget</th>
<th>Purchase share of total food consumption expenditure</th>
<th>Sales share of total food consumption expenditure</th>
<th>Real prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Food</td>
<td></td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Cereals</td>
<td>44.7</td>
<td>46.4</td>
<td>17.90</td>
</tr>
<tr>
<td>Teff</td>
<td>10.3</td>
<td>10.9</td>
<td>3.05</td>
</tr>
<tr>
<td>Barley</td>
<td>7.0</td>
<td>4.8</td>
<td>2.19</td>
</tr>
<tr>
<td>Wheat</td>
<td>9.0</td>
<td>11.6</td>
<td>4.70</td>
</tr>
<tr>
<td>Maize</td>
<td>11.5</td>
<td>10.4</td>
<td>5.53</td>
</tr>
<tr>
<td>Sorghum</td>
<td>6.9</td>
<td>8.7</td>
<td>2.42</td>
</tr>
<tr>
<td>Root crops</td>
<td>9.7</td>
<td>7.6</td>
<td>2.09</td>
</tr>
<tr>
<td>Pulses and oilseeds</td>
<td>8.5</td>
<td>8.2</td>
<td>6.03</td>
</tr>
<tr>
<td>Fruits &amp; vegetables</td>
<td>2.2</td>
<td>4.0</td>
<td>1.71</td>
</tr>
<tr>
<td>Animals products</td>
<td>9.1</td>
<td>9.2</td>
<td>4.44</td>
</tr>
<tr>
<td>Other foods</td>
<td>25.9</td>
<td>24.7</td>
<td>18.96</td>
</tr>
</tbody>
</table>

Source: Authors’ computation from ERHS panel data
# Empirical Results

<table>
<thead>
<tr>
<th></th>
<th>1st order</th>
<th>2nd order</th>
<th>20% consumers &amp; 10% producers prices increase</th>
<th>Losers</th>
<th>Welfare loses among losers</th>
<th>Gainers</th>
<th>Welfare gain among gainers</th>
<th>Poverty at household level; 2004 as a base and 0.7% and 0.9% welfare increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Households</td>
<td>0.003</td>
<td>0.007</td>
<td>0.009</td>
<td>38.85</td>
<td>-0.062</td>
<td>61.15</td>
<td>0.050</td>
<td>33.1  31.3  31.1</td>
</tr>
<tr>
<td>Income quintiles</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>Q1 (lowest)</td>
<td>-0.003</td>
<td>0.001</td>
<td>0.002</td>
<td>48.65</td>
<td>-0.064</td>
<td>51.35</td>
<td>0.063</td>
<td>49.3  46.6  46.3</td>
</tr>
<tr>
<td>Q2</td>
<td>-0.002</td>
<td>0.002</td>
<td>0.004</td>
<td>38.64</td>
<td>-0.074</td>
<td>61.36</td>
<td>0.050</td>
<td>42.7  42.3  42.3</td>
</tr>
<tr>
<td>Q3</td>
<td>0.010</td>
<td>0.014</td>
<td>0.018</td>
<td>32.31</td>
<td>-0.066</td>
<td>67.69</td>
<td>0.052</td>
<td>37.2  34.1  34.1</td>
</tr>
<tr>
<td>Q4</td>
<td>0.001</td>
<td>0.004</td>
<td>0.006</td>
<td>38.64</td>
<td>-0.060</td>
<td>61.36</td>
<td>0.044</td>
<td>25.0  22.6  22.3</td>
</tr>
<tr>
<td>Q5 (highest)</td>
<td>0.007</td>
<td>0.012</td>
<td>0.016</td>
<td>35.93</td>
<td>-0.045</td>
<td>64.07</td>
<td>0.044</td>
<td>11.3  10.6  10.6</td>
</tr>
<tr>
<td>Cereals net marketing position</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Net-cereal buyers (50% HH)</td>
<td>-0.019</td>
<td>-0.016</td>
<td>-0.018</td>
<td>55.35</td>
<td>-0.073</td>
<td>44.65</td>
<td>0.056</td>
<td>32.8  30.6  30.3</td>
</tr>
<tr>
<td>Net-cereal sellers (25% HH)</td>
<td>0.022</td>
<td>0.029</td>
<td>0.036</td>
<td>18.31</td>
<td>-0.050</td>
<td>81.69</td>
<td>0.046</td>
<td>24.3  23.0  23.0</td>
</tr>
<tr>
<td>Autarkic (25% of HH)</td>
<td>0.025</td>
<td>0.029</td>
<td>0.036</td>
<td>26.42</td>
<td>-0.023</td>
<td>73.58</td>
<td>0.048</td>
<td>42.6  40.9  40.9</td>
</tr>
</tbody>
</table>
Concluding remarks

- Real food prices have increased between 2004 and 2009
  - The real food prices is much higher in 2009
- Increase in real prices of animal products, pulses and fruits and vegetables are higher than cereal crops
- Welfare effects of rising food prices are computed from sales and purchase and received as gift and remittance share in total food consumption as rural households in Ethiopia do not entirely depend on market
- At aggregate level, rural households benefit from rising real food prices. Welfare gains further improve with substitution effects, albeit not evenly distributed among populations.
- There are households hit hard by high food prices. These include about 45% of net cereal buyers.
- Increasing agricultural intensification through providing access to fertilizer and improved seed varieties can help household affected by high food prices to be net-seller.
- Higher prices stimulate production, leading to lower prices in the long term
  - boost investment in value chain development and transform the rural economy.
  - Input prices (fertilizer) have gone up significantly – faster than output prices

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Thank you

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