Context

- What do agricultural trade policy makers do?
- Why might they do it?
- Does it work?
- What might work better?
Agricultural trade policy responses
What drives agricultural trade policy

- We have a great deal of theory to explain how policy makers set the level of protection
  - Depends on levels of political support
  - And the cost of protecting particular sectors
  - This theory guides our policy advice for trade reform

- But the past few years of price volatility have highlighted something very different
  - Policy makers set domestic prices to insulate against sudden price shocks
    - Particularly for staples like rice & wheat
  - But pass through longer run changes in prices
Food CPIs in developing countries
Indexes of staple food prices

[Graph showing the indexes of staple food prices from January 2006 to January 2013. The graph compares domestic and international prices, with domestic prices represented by a blue line and international prices by a red line.]
Very strong insulation for rice
Also strong insulation for wheat
Weaker insulation for maize
Much weaker insulation for soybeans
Why might policymakers do this?
What drives agric trade policy?

- Partly an inverse relationship between world prices and protection rates
  - With the goal of stabilizing domestic prices
- Also a centripetal force holding domestic prices in a stable relationship with world prices?
  - Perhaps driven by Grossman–Helpman political–economy (PE) forces
    - Tending to result in high average protection in rich importers, low protection in poor exporters
- And, when prices rise, concerns about impacts on the poor
Price insulation, rice, all countries

Source: Kym Anderson
(www.worldbank.org/agdistortions)
Governments seem averse to sharp changes in prices
  ◦ But also to moving too far from the Political Economy (PE) equilibrium

Perhaps like an Error Correction Model?
  ◦ $\Delta \tau = \alpha (p^w - p^w_{t-1}) + \beta [p_{t-1} - \gamma p^w_{t-1}]$

  - Where $\tau = (p - p^w) \approx (1 + t)$; $\alpha$ reflects costs of adjustment, $\alpha < 0$
  - $[p_{t-1} - \gamma p^w_{t-1}]$ is the deviation from the political-economy equilibrium;
  - $\beta$ the cost of being out of equilibrium, $\beta < 0$
  - All variables in logs
## ECM estimates

<table>
<thead>
<tr>
<th>Item</th>
<th>$\alpha$</th>
<th>$\beta$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>-0.50</td>
<td>-0.36</td>
</tr>
<tr>
<td>Wheat</td>
<td>-0.52</td>
<td>-0.31</td>
</tr>
<tr>
<td>Sugar</td>
<td>-0.53</td>
<td>-0.20</td>
</tr>
<tr>
<td>Maize</td>
<td>-0.35</td>
<td>-0.44</td>
</tr>
<tr>
<td>Soybeans</td>
<td>-0.40</td>
<td>-0.46</td>
</tr>
<tr>
<td>Beef</td>
<td>-0.39</td>
<td>-0.31</td>
</tr>
<tr>
<td>Poultry</td>
<td>-0.34</td>
<td>-0.46</td>
</tr>
</tbody>
</table>

*Strong insulation for staples*
Short run impacts of food prices on welfare largely depend on whether households are net buyers or net sellers
  ◦ Consumers adjust, but elasticities typically low
  ◦ Urban households typically net buyers so hurt
  ◦ Farm households in poor countries often net buyers

In the longer term, wages may affect result

Producer responses may also be important
  ◦ Elasticities likely much larger than on demand side
Channels of effect

- Exogenous food price changes affect household welfare directly
  - Through own-price effects on the cost of living
  - And on the value of output from household business
    - Deaton net-buyer, net seller criterion

- Also affect factor prices, esp unskilled wages
  - Stolper–Samuelson effects

- Useful to combine these two approaches
Capturing food price impacts on welfare

- Consider welfare of a household as a function of prices and wages

\[ B = \pi(p, w) - e(p, w, u) = z(p, w, u) \]

- \( \pi(p, w) \) represents profits from household firm(s)
- \( e(p, w, u) \) a “full” cost function representing the cost of expenditure less wage earnings
  - Represents the behavior of the household as consumer & factor supplier
1st order impacts of change in $p$

$$dB = (\pi_p - e_p)\Delta p + (e_w - \pi_w)\Delta w$$

*Net sales* 
*Price change*

*Net Labor Sales* 
*Wage change*
Short run impacts– no wage change

- Begin with the Deaton method to measure impacts on household real incomes
  \[ \Delta B = (\pi_p - e_p) \Delta p = z_p \Delta p \]
  - Where \( e_p \) is food demand & \( \Pi_p \) is the household’s supply
  - Net sales determine the effect on incomes

- Plus 2nd order effects on the demand side
  \[ \Delta B = z_p \Delta p + \frac{1}{2} \Delta p e_{pp} \Delta p \]
Medium & Long–run welfare

\[ \Delta B = [Z_p \quad Z_w] \begin{bmatrix} \Delta p \\ \Delta w \end{bmatrix} + \frac{1}{2} \begin{bmatrix} \Delta p & \Delta w \end{bmatrix} \begin{bmatrix} Z_{pp} & Z_{pw} \\ Z_{wp} & Z_{ww} \end{bmatrix} \begin{bmatrix} \Delta p \\ \Delta w \end{bmatrix} \]

- 1\textsuperscript{st}–order impacts are Deaton measures + wages
- 2\textsuperscript{nd} order impacts take into account qty changes
  - \( Z_{pp} \) are changes in quantities because of price changes
  - \( Z_{ww} \) changes in labor supplied outside hhold business
  - \( Z_{pw}, Z_{wp} \) are cross effects
Recent food price rises appear to have arisen outside low income countries
  ◦ Biofuel growth
  ◦ Black Sea basin droughts
  ◦ Low stocks
  ◦ Speculation?

Quite different from a price rise due to drought

Specify wage responses to food price changes
  ◦ Assume no structural change in developing countries
  ◦ Maintain constant employment levels
Calculating wage–price elasticities
- Effect arises because of different factor intensities
- Poor–country agriculture very intensive in unskilled labor
- Higher food prices raise wages for unskilled workers

Use national versions of the GTAP model
- Only need the supply side
- To assess impacts of higher food prices on wages for unskilled labor

How much do food prices affect wages of poor?
## Wage–price elasticities

<table>
<thead>
<tr>
<th>Country</th>
<th>Main commodity</th>
<th>Elasticity</th>
<th>All Food</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>Rice</td>
<td>0.6</td>
<td>1.2</td>
</tr>
<tr>
<td>China</td>
<td>Other proc. foods</td>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td>India</td>
<td>Other proc. foods</td>
<td>0.3</td>
<td>1.0</td>
</tr>
<tr>
<td>Nigeria</td>
<td>Cassava</td>
<td>0.5</td>
<td>1.2</td>
</tr>
<tr>
<td>Pakistan</td>
<td>Milk</td>
<td>0.2</td>
<td>1.1</td>
</tr>
</tbody>
</table>
Global Poverty Impacts

- Assess impacts on the income of each household
- Calculate resulting poverty measures
  - Headcount, poverty gap, poverty gap squared etc
- Extrapolate from national to global impacts
  - Use sample to represent countries regional WB income group
Sample countries

31 countries
315,000 households; 76% of world’s poor
## Poverty headcount: 10% food price rise

<table>
<thead>
<tr>
<th>Country</th>
<th>Short run</th>
<th>Short run + wages</th>
<th>Medium run</th>
<th>Long run</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bangladesh</td>
<td>1.4</td>
<td>0</td>
<td>-0.4</td>
<td>-0.6</td>
</tr>
<tr>
<td>China</td>
<td>-1.3</td>
<td>-1.9</td>
<td>-2.1</td>
<td>-2.2</td>
</tr>
<tr>
<td>India</td>
<td>2.6</td>
<td>-1.1</td>
<td>-1.2</td>
<td>-1.4</td>
</tr>
<tr>
<td>Indonesia</td>
<td>1.7</td>
<td>0.8</td>
<td>0.8</td>
<td>1</td>
</tr>
<tr>
<td>Vietnam</td>
<td>-0.4</td>
<td>-2.1</td>
<td>-2.2</td>
<td>-1.9</td>
</tr>
<tr>
<td>Zambia</td>
<td>1.1</td>
<td>-0.4</td>
<td>-0.4</td>
<td>-0.9</td>
</tr>
<tr>
<td>Global</td>
<td>0.8</td>
<td>-1.1</td>
<td>-1.2</td>
<td>-1.4</td>
</tr>
</tbody>
</table>
## Food price impacts on poverty

### Rural households

<table>
<thead>
<tr>
<th>Food price change</th>
<th>Short run</th>
<th>Short run + wages</th>
<th>Medium run</th>
<th>Long run</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>0.5</td>
<td>−1.4</td>
<td>−1.6</td>
<td>−1.8</td>
</tr>
<tr>
<td>50%</td>
<td>4.3</td>
<td>−5.7</td>
<td>−6.7</td>
<td>−8</td>
</tr>
<tr>
<td>100%</td>
<td>8.9</td>
<td>−9.5</td>
<td>−11.4</td>
<td>−13</td>
</tr>
</tbody>
</table>

### Urban households

<table>
<thead>
<tr>
<th>Food price change</th>
<th>Short run</th>
<th>Short run + wages</th>
<th>Medium run</th>
<th>Long run</th>
</tr>
</thead>
<tbody>
<tr>
<td>10%</td>
<td>1.5</td>
<td>−0.3</td>
<td>−0.4</td>
<td>−0.4</td>
</tr>
<tr>
<td>50%</td>
<td>9.2</td>
<td>0.2</td>
<td>−0.4</td>
<td>−0.6</td>
</tr>
<tr>
<td>100%</td>
<td>22.5</td>
<td>3.2</td>
<td>1.1</td>
<td>0.9</td>
</tr>
</tbody>
</table>

- Rural households benefit more than urban in long run
- Wage impacts important for urban & rural households
  - Urban households worse off even in the long run
Policy makers respond rationally

- Very concerned about the adverse impacts of food price shocks on the poor
  - And especially the urban poor
  - Hence short-run insulation

- But willing to allow longer-term changes in prices to be transmitted
Did it work?
Was the 2006–8 insulation a success?

- Policy makers insulated their domestic prices against the surge in world prices

- But their actions contributed substantially to these increases in world prices
  - A beggar thy neighbor problem
  - Even countries that don’t want to insulate are forced to

- Each individual country sees its actions as a success
  - But is this the case for countries as a whole?
Ineffectiveness: equal export tax & import duty reduction
Methodology

- Calculate the changes in trade distortions between 2006 & 2008 for each country
- Calculate impacts of these changes on world & domestic prices
- Calculate counterfactual poverty implications
  - Poverty impacts of each country’s own policies alone
  - Poverty impacts of all actions
## Poverty impacts at $1.25/day, % pts

<table>
<thead>
<tr>
<th>Country</th>
<th>Everyone’s action</th>
<th>Own actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>0.4</td>
<td>-0.6</td>
</tr>
<tr>
<td>Côte d’Ivoire</td>
<td>0.5</td>
<td>-1.8</td>
</tr>
<tr>
<td>Indonesia</td>
<td>0</td>
<td>-1.4</td>
</tr>
<tr>
<td>India</td>
<td>0.1</td>
<td>-4.2</td>
</tr>
<tr>
<td>Malawi</td>
<td>2.4</td>
<td>0.7</td>
</tr>
<tr>
<td>Niger</td>
<td>1.0</td>
<td>-0.5</td>
</tr>
<tr>
<td>Nigeria</td>
<td>-0.9</td>
<td>-1.9</td>
</tr>
<tr>
<td>Tanzania</td>
<td>0.1</td>
<td>-0.3</td>
</tr>
<tr>
<td>Viet Nam</td>
<td>-2.6</td>
<td>0.3</td>
</tr>
<tr>
<td>Zambia</td>
<td>-1.9</td>
<td>-1.5</td>
</tr>
<tr>
<td>World (million)</td>
<td>8</td>
<td>-84</td>
</tr>
</tbody>
</table>
Problems with insulation

- It looks successful even when it isn’t

- It’s contagious
  - If other countries do it, I have to as well
    - Even if I would not have intervened

- Export restrictions, in particular, raise concerns about food availability
  - And face next to no constraints from WTO rules
Some policy options
Potential policy options

- Improving information & market efficiency
- Social safety nets
- Rational storage policies
- Disciplines on the collective action problem
Improving information

- Poor information about stocks played an important role in the 2008 food crisis

- Improving market information an important goal of the AMIS initiative
  - Better market information can have an enormous impact
    - Improved information technology can have a huge impact

- Need to avoid extrapolative expectations
  - By market participants and governments
Social safety nets

- Policies such as social safety nets are individually and collectively effective
  - There is an income effect that adds to price volatility
    - but the increase in demand by the poor is offset by a decline in demand from the rich
    - Despite this “rebound”, access to food by the poor can be increased

- Domestic food aid exempt from WTO disciplines
  - Consistent with both mercantilist & economic logic

- Insulating policies cause substitution towards food by all consumers
  - The combination of substitution and income effects creates the ineffectiveness problem
Rational storage policies

- Storage is potentially “help thy neighbor” as distinct from “beggar thy neighbor” insulation
- Combinations of trade and storage more cost-effective for small countries than either pure insulation or pure storage policies
- But storage policies for a small country require use of insulating trade policies
  - And combined storage & trade still end up being beggar-thy-neighbor
- In practice, storage is frequently destabilizing
  - Excessive stocks accumulated in many countries during 2008–10
Disciplines on insulating policies

- Some precedents in WTO
  - Price-based SSM proposal would involve a discipline on the duties used to offset falls in world prices

- Needed to reduce the collective action problem
  - Creating more “policy space” for all members doesn’t address the collective action problem
  - Need to remember that the WTO is about addressing collective action problems

- Partial disciplines on export restrictions likely important
Conclusions

Policy makers appear to adjust protection in response to changes in world prices
  ◦ This makes sense for individual countries
    • Both for political–economy considerations and in light of poverty reduction goals

In the short run, food price increases appear to increase poverty
  ◦ But to lower it in the longer term
    • When supplies adjust and unskilled wage rates rise

Collectively, insulation appears to be ineffective
  ◦ Need to develop policies that work
  ◦ Lots more research and policy development needed


