Impact on World Prices of Many Countries Using Trade Policy to Stabilize Domestic Food Prices

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Policy message

- Exogenous supply shocks cause int’l food price spikes when global stocks are low (Wright 2011)
- If govts. alter trade restrictions in response to such price spikes, that market insulation will:
  - *exacerbate* international price spike
  - *but may do little to reduce* domestic price rise
- Applies also in downward price spike periods
  - Not understood by SSM proponents in Doha Round?
- Solution: avoid standing-up-in-the-stadium problem by multilateral agreement to tighten WTO disciplines
  - required of both exporters and importers
Outline

- Causes: understandable political economy
- Effects: the simplest theoretical model
- Evidence of intervention: from recent and previous food price spikes
- Estimates of contributions of intervention to int’l price spikes
- Policy implications
Causes of market insulation

A govt wishing to avert losses for key groups will adjust rates of distortion to domestic food prices to partially offset deviations of int’l prices (up or down) from trend

- i.e., govt helps consumers when prices spike upward, farmers when prices spike downward
- Follows from Freund & Özden’s (AER, 2008) application of Grossman/Helpman model

Likely to involve trade measures if govt. considers domestic measures are too costly politically or fiscally
Effects of market insulation policies on international prices

Think of int’l market for a single product that is subjected to an exogenous (weather-related) supply shock when global stocks are low.

- Shifts excess supply curve to left

Then consider:

- food-exporting country group responses,
- food-importing country group responses,
- and then their combined effect
Qua quantity of international trade

Price

ES₁

ES₀

ED₀

P₁

P₀

Q₁

Q₀

Quantity of international trade
Quantity of international trade

Price

Quantity of international trade

ES$_1$

ES$_0$

ED'$

ED$_0$

P'

P$_1$

P$_0$

Q$_1$

Q'

Q$_0$
Quantity of international trade
Net effect of both groups’ responses

- Int’l price rise is exacerbated, and more so if trade measures rather than a cons’m subsidy is used
- Yet when many (both X & M) countries so insulate, net domestic price effect may be zero insulation from initial exogenous shock
  - plus a welfare transfer from food-importing to food-exporting countries of area $P_1E_1E_3P_3$
- And conversely for downward price spike
- Similar to a crowd standing in a stadium to see better: on average no-one is better off, but tall gain at the expense of the short
Evidence of partial insulation

Most farm product NRAs (and CTEs) tend to be negatively correlated with movements in international product price.

- Annual estimates for 82 countries (half HICs+TEs, half developing) & 75 farm products, 1955-2010

- On average, for top dozen traded farm products, **barely half** the change in an int’l price is transmitted to domestic markets within first year

- Particularly clear when int’l prices spike
Maize NRA, 1970 to 2010

- Intern. Price in USD
- NRA all countries
**Short-run price transmission elasticity ests.**

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<tbody>
<tr>
<td></td>
<td>Globally, 1970-2010</td>
<td></td>
</tr>
<tr>
<td>Rice</td>
<td>0.41</td>
<td></td>
</tr>
<tr>
<td>Wheat</td>
<td>0.57</td>
<td></td>
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<tr>
<td>Maize</td>
<td>0.67</td>
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Evidence of partial insulation by exporters AND importers when int’l food prices spike

*Both* country groups alter their NRAs and CTEs (shown as proportional changes (NACs) in the following slides)
% change in NAC for rice in price-spike periods

- 1972-74
- 1984-86
- 2005-08
% change in NAC for wheat in price-spike periods

- 50  - 30  - 10  10  30  50  70

1972-74  1984-86  2005-08

Importers  Exporters
% change in NAC for maize in price-spike periods

- 1972-74: Importers -30, Exporters -10
- 1984-86: Importers 50, Exporters 30
- 2005-08: Importers 10, Exporters 5
How much have partial insulation policies contributed to int’l price spikes?

Think of global market equilibrium as:

\[ \sum_i (S_i(p_i) + v_i) - \sum_i D_i(p_i) = 0 \]

where \( v_i \) is an exogenous production shock variable and \( p_i \) is the domestic price (different from the int’l price \( p_i^* \) to the extent of a trade tax, \( t_i \) )
Trade tax contribution to int’l price spike

If $T_i (=1+t_i)$ is power of the trade tax $t_i$, then proportional change in int’l price is

$$
\hat{p}^* = \frac{\sum_i H_i \hat{v}_i + \sum_i (H_i \gamma_i - G_i \eta_i) \hat{T}_i}{\sum_i (G_i \eta_i - H_i \gamma_i)}
$$

where:

$\hat{v}_i$ is an exogenous shock to i’s supply,

$H_i$ and $G_i$ are national shares of global prod’n & cons’m at int’l price, and

$\gamma_i$ and $\eta_i$ are supply & demand elasticities
Trade tax contribution to int’l price spike (continued)

- If supply cannot respond in short term, & if national demand elasticities are equal, then contrib’n of changes in $T_i$'s to changes in $p^*$ is simply the negative of consumption-weighted global average of $T_i$ changes.

- However, if changes in trade restrictiveness are not independent of other influences ($R$) on $p^*$, then policy contrib’n is reduced to:

$$\frac{\hat{T}}{\hat{T} + R}$$
### Consumption-weighted global average of $T_i$ changes (%)

<table>
<thead>
<tr>
<th></th>
<th>1972-74</th>
<th>2005-08</th>
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</thead>
<tbody>
<tr>
<td>Rice</td>
<td>-56</td>
<td>-40</td>
</tr>
<tr>
<td>Wheat</td>
<td>-30</td>
<td>-14</td>
</tr>
<tr>
<td>Maize</td>
<td>-21</td>
<td>-12</td>
</tr>
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</table>
## Int’l price rises (cumulative, nominal, %)

<table>
<thead>
<tr>
<th></th>
<th>1972-74</th>
<th>2005-08</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>300</td>
<td>127</td>
</tr>
<tr>
<td>Wheat</td>
<td>158</td>
<td>100</td>
</tr>
<tr>
<td>Maize</td>
<td>135</td>
<td>126</td>
</tr>
<tr>
<td>Soybean</td>
<td>98</td>
<td>90</td>
</tr>
<tr>
<td>Sugar</td>
<td>309</td>
<td>29</td>
</tr>
</tbody>
</table>
### Proportional contribution of trade tax changes to int’l price spikes

<table>
<thead>
<tr>
<th></th>
<th>1972-74</th>
<th>2005-08</th>
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</thead>
<tbody>
<tr>
<td>Rice</td>
<td>0.27</td>
<td>0.31</td>
</tr>
<tr>
<td>Wheat</td>
<td>0.23</td>
<td>0.13</td>
</tr>
<tr>
<td>Maize</td>
<td>0.18</td>
<td>0.18</td>
</tr>
<tr>
<td>Soybean</td>
<td>0.01</td>
<td>0.45</td>
</tr>
<tr>
<td>Sugar</td>
<td>0.18</td>
<td>0.56</td>
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## Decomposing policy contributions, 2005-08

<table>
<thead>
<tr>
<th></th>
<th>TOTAL PROPORT’L CONTRIBUTION</th>
<th>High-income countries</th>
<th>Developing countries</th>
<th>Importing countries</th>
<th>Exporting countries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rice</td>
<td>0.31</td>
<td>0.01</td>
<td>0.30</td>
<td>0.13</td>
<td>0.18</td>
</tr>
<tr>
<td>Wheat</td>
<td>0.13</td>
<td>0.06</td>
<td>0.07</td>
<td>0.06</td>
<td>0.07</td>
</tr>
<tr>
<td>Maize</td>
<td>0.18</td>
<td>0.08</td>
<td>0.10</td>
<td>0.07</td>
<td>0.11</td>
</tr>
<tr>
<td>Soybean</td>
<td>0.45</td>
<td>0.17</td>
<td>0.28</td>
<td>0.21</td>
<td>0.24</td>
</tr>
<tr>
<td>Sugar</td>
<td>0.56</td>
<td>0.11</td>
<td>0.45</td>
<td>0.30</td>
<td>0.26</td>
</tr>
</tbody>
</table>
How much would int’l prices have risen in 2005-08 without altered trade restrictions (%)?

<table>
<thead>
<tr>
<th></th>
<th>International price rise</th>
<th>Domestic price rises</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>including contribution of changed trade restrictions</td>
<td>net of contribution of changed trade restrictions</td>
</tr>
<tr>
<td>Rice</td>
<td>127</td>
<td>78</td>
</tr>
<tr>
<td>Wheat</td>
<td>100</td>
<td>84</td>
</tr>
<tr>
<td>Maize</td>
<td>126</td>
<td>112</td>
</tr>
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</table>
Policy implications

- **When prices spike upwards**, WTO commitments don’t help because of absence of effective disciplines on agric export restrictions.
  - Such disciplines need not rule out use of less-costly domestic measures to more-directly assist vulnerable losers from international price spikes.

- Large cuts to WTO-bound tariffs would be needed to reduce binding overhang & thus the prospect of NRA increases **when prices spike downwards**.
  - SSM proposes the opposite! AND, its proponents don’t acknowledge that actions by importers would trigger a larger offsetting response by exporters.
Thanks!

The above updates and revises the analysis in:
