What are the sources of insecurity?

① Price spikes like 2007/8?
  - Wealthy countries are minority consumers – can tolerate a doubling of farm gate food prices
  - Poor countries (and especially the poorest non-farmer citizens of such countries) are vulnerable
  - Spikes force government intervention, suppression of private sector development?
What are the sources of insecurity?

① Price spikes like 2007/8?
- Expect continued grain market pressure and instability if biofuels use of grains continues to expand as US farmers expect (or hope)
- E10 to E85!

② Export bans like 2007/08?
- Really bans??
- May be exacerbated by state trading, lack of decentralized private initiative
- Realism: no exporter government will starve its citizenry and hope to live to enjoy the rewards of trade
- *Can be fatal*: Niger drought disaster after neighbors reneged on commitment to open borders
What are the sources of insecurity?

③ Credit market failure like 2008?
  ➢ Problems financing stocks and trade?

④ Interruption of physical access?
  ➢ blockade?
  ➢ Sea lanes interruption? (Persian Gulf?)
  ➢ Landlocked may face closed borders

What are the sources of insecurity?
What are the sources of insecurity?

⑤ Obligation to neighbors in distress?

- Saudi Arabia and Gulf states?
- Serious topic: Blockade of Straits of Hormuz?
- No oil out
- No grain in to Gulf States

Weather and Global Warming causing shortfalls? *Really?*
US Corn Harvest

Figure 3. Deviation of U.S. Non-Irrigated Corn Yield from Linear Trend, 1960-2012

Source: NASS/USDA

Cost push?

Ratio of Index of Prices Received for All Crops to Index of Prices Paid for Production Items, Interests, Taxes and Wages Rates U.S., 1972-1979 vs. 2005-2012

Source: Carl Zulauf and Nick Rettig “Comparing Current and 1970 Farm Prosperity: Crop Prices, Farmdoc March 22, 2013, Figure 3
Transfer to Farmer Wealth:
Financial crisis plus biofuels

![Figure 2. Farm Real Estate Value Deflated to 2012 Values by GDP Deflator, U.S., 1973-1981 vs. 2006-2012](image)


Consumption Surge in India and China?
Consider their net exports:

![Graph showing consumption surge in India and China](image)
Production?
World Rice Real Price Index and Production (1961 – 2012)

Index of World Detrended Price vs. Index of Detrended Production for Rice (1961-2012)
Calories price and grain prices

Table 1: Correlation Coefficients of Detrended Grains Prices (1961 – 2012)

<table>
<thead>
<tr>
<th></th>
<th>Calorie</th>
<th>Corn</th>
<th>Rice</th>
<th>Wheat</th>
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</thead>
<tbody>
<tr>
<td>Calorie</td>
<td>1.00</td>
<td>0.93</td>
<td>0.98</td>
<td>0.96</td>
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<tr>
<td>Corn</td>
<td>0.93</td>
<td>1.00</td>
<td>0.85</td>
<td>0.92</td>
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<td>Rice</td>
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<tr>
<td>Wheat</td>
<td>0.96</td>
<td>0.92</td>
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</tbody>
</table>

Index of World Detrended Price vs. Index of World Detrended Production for Calories

Index of World Detrended Price vs. Index of World Detrended Production for Calorie
Index of Detrended Price versus Observed Stock-to-Use Ratio for Rice

Index of Detrended Price versus Observed Stock-to-Use Ratio for Calories
Nonlinearity of Inverse Total Demand Function and Price Dynamics

Nonlinearity of Inverse Total Demand Function and Price Dynamics

When stocks are low, price is very sensitive to disturbances in supply.

Note: Because of the high nonlinearity of the inverse total demand function, for equivalent negative shock to availability, price jumps increasingly more for smaller original availability before the shock.

Permanent Mandate
Anticipated and Imposed
Shifts due to a Temporary Mandate versus Permanent Mandate

Note: $\Delta \rho_{\text{temp}}$ represents the price rise due to anticipation of temporary mandate next year, while $\Delta \rho_{\text{perm}}$ represents the price rise due to anticipation of a permanent mandate starting from next year. The vertical dashed line represents the availability when the mandate is announced.

Does Storage Dynamics Explain Prices?
Detrended Price-implied Stocks Data vs. Detrended Observed Price Index for Calories

Actual Stocks vs. Stocks implied by Price Data for Calories
Actual SUR vs. price-estimates-implied SUR for Calories
(why good fit only through 2004?)

Source: Calculated using supply and use data from Feed Grain Database, USDA.
Note: Annual supply-use statistics provided by USDA are on a marketing-year basis.
Policy Options

- Self sufficiency:
- Strategic reserves
- Virtual reserves (IFPRI 2008)
- Subsidize storage
- Ban Export Bans (if you can)
- Limit biofuels use of grains and sugar
- Farmer risk management
- Acquire foreign farmland and grow the national staple
- Biofuels diversion contracts

Policy Options: Tools for Execution?

- Strategic reserves

- Subject to political interference - almost always against security and in favor of pressing political interests
- Acquisition and disposal rules contentious (see e.g. commodity fund rules)
Policy Options: Tools for Execution?

- Strategic reserves
  - US strategic petroleum reserve as example
  - But substitution reduces effectiveness inevitably
  - Speculative attacks look bad, but actually can increase efficiency
  - US silver reserve as cautionary tale (among others)

Public and Private Stocks: Interactions

<table>
<thead>
<tr>
<th>Cropyear ending in</th>
<th>Average support rate</th>
<th>Private stocks</th>
<th>CCC stocks</th>
<th>Total stocks</th>
<th>Change in private as a % of change in total</th>
<th>Change in total as a % of change in CCC</th>
</tr>
</thead>
<tbody>
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<td>925</td>
<td>1147</td>
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<tr>
<td>1973</td>
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<td>1974</td>
<td>1.05</td>
<td>483</td>
<td>0</td>
<td>483</td>
<td>-178</td>
<td>36</td>
</tr>
</tbody>
</table>

Source: USDA Feed Grain Situation, various issues.
Policy Options: Tools for Execution?

- Strategic reserves
  - US silver reserve as cautionary tale (among others)

Policy Options: Tools for Execution?

- Virtual Reserves (IFPRI 2008)
  - Naked short positions where necessary to convince markets that their price expectations will not be fulfilled?
  - What would have happened if adopted in 2007/08?
Ban Export Bans?

• Prisoner’s dilemma
• Export bans can prevent hunger in weak regimes

• Fundamental trade problem:
  **Biofuels as classic (but huge) price discrimination**

  *Divert grain from inelastic (food) to elastic energy) demand market*

Policy Options: Tools for Execution?

**Limit biofuels use of grains and sugar**

• Not just in EU and US

• Biofuels expansion implies huge transfer to landowners and farmers

• Huge transfer *from* poor consumers
Acquire foreign farmland and grow the national staple

- Acquire foreign farmland and grow the national staple
  - Good deal for all? Capital or oil for land output and supply security?
  - Sovereign risk?
  - Political commitment durability?

Policy Options: Tools for Execution?

- Acquire foreign farmland and grow the national staple
  - Buy-in from private sector?
  - Buy-in from resident peasants?
  - “terra nullius??”
Policy Options: Tools for Prevention/Amelioration?

• Political alliances, naturally

• Reduce incentive to use biofuels by moderating oil prices?

• Support transparency in grain markets
  – AMIS initiative
  – Reduce ignorance that generates panic

Policy Options: Tools for Execution?

• Subsidize storage?
  – Advantage: depoliticize buy-sell decisions
References:


