Measuring the impacts of trade barriers and market interventions on maize price instability: Evidence from Eastern and Southern Africa

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Regional Consultation Workshop on:
"The Use and Impact of Trade and Domestic Policy Interventions on Cereal Value Chain Stakeholders in Eastern and Southern Africa"
Dar es Salaam, Tanzania, June 3-4, 2009

Organization of presentation

1. What is the problem?
2. Competing models of roles of state and private sector in food markets
3. Price Instability in ESA
   a) Data and methods
   b) Results-Comparison of price instability between countries following: open border polices vs. ad hoc & discretionary intervention policies
4. Policy implications and conclusion
What is the problem?

- Major misunderstanding of the staple food and input market policy environment ESA
  - “liberalization” – a misnomer
  - Marketing boards continue to play major role in food and input markets. Share of nationally marketed maize:
    - 15-57% (Kenya)
    - 3-32% (Malawi)
    - 11-80% (Zambia)
  - Discretionary use of trade policy instruments
  - Bottom line: “interventionist liberalization” more appropriate characterization of policy environment in many countries in region
  - Affects scope for private trade and investment

- There is a strong rationale for continued state operations in food markets and trade
  - The perception that leaving the private sector to operate on its own may bring untolerable levels of price instability
  - So, strong theoretical argument for state operations to moderate price swings
  - However, there are strategic interactions between private and public sector in markets – the behavior of one affects the other
  - If government actions in markets are unpredictable and discretionary, this may limit scope of private participation and trade

- Hence – impact of state trade and marketing policies on price instability is essentially an empirical question
Sources of Policy Unpredictability

- Export bans, import quotas (year to year & within year)
- Uncertainty over changes in import tariff rates
- When and where will marketing boards enter the market, at what price?
- All of these sources of unpredictability impede private traders’ servicing small farmers’ needs
- Conclusion: Prices may shoot over import parity due and appear to represent a market failure

Example of so called ‘market failure’

National food production shortfall anticipated

Who’s going to import? And how much?

State announces plan to import X tons

Supplies dwindle; prices skyrocket

“EVIDENCE THAT MARKETS FAIL!”

State incurs delays in contracting for imports

Private traders sit on sidelines

Market failure or coordination/governance failure?
Competing models of roles of state and private sector in food markets:

<table>
<thead>
<tr>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Rely on markets</strong>&lt;br&gt;state role limited to:&lt;br&gt;• Public goods investment&lt;br&gt;• Regulatory framework&lt;br&gt;• Strengthening of institutions / defense of property rights&lt;br&gt;• Policies supportive of private sector entry and competition</td>
<td><strong>Primary reliance on markets</strong>&lt;br&gt;- but role for <em>rules-based state operations</em>&lt;br&gt;• e.g., buffer stock release in response to defend stated ceiling price&lt;br&gt;• Marketing board purchases at stated floor price announced in advance&lt;br&gt;• Transparent rules for initiating state imports</td>
<td><strong>Role for markets and discretionary state intervention</strong>&lt;br&gt;• Based on premise that private sector cannot ensure adequate food supplies in response to production shortfalls&lt;br&gt;• Justification for unconstrained role for state interventions in markets to correct for market failures</td>
</tr>
</tbody>
</table>

What is the right strategy?

- Poulton et al (2006) note that there is no credible government commitment to Model 1 (*full liberalization*), hence Model 2 (*markets with rule-based state operations*) is preferred.
- However, questionable whether Model 2 could be perceived as credible either.
- Many governments insist on unconstrained authority to intervene whenever necessary (i.e., Model 3).
- With low level of trust and commitment problems, Model 3 (*ad-hoc interventionism*) may become the long-run equilibrium.
- Model 3 has in fact become the dominant model among the main maize-producing countries in the region.
Maize Price Instability in ESA

Empirical Question

- Are maize grain prices more stable and predictable in countries:
  - using trade barriers and marketing board operations to stabilize grain prices
  - versus
  - countries with open border policy and relying on trade to stabilize prices?

Data and Methods

- Monthly retail/wholesale maize grain prices from 7 countries - January 1994 to December 2008

- Countries
  - Group A: Mozambique, Uganda, South Africa (open border policy)
  - Group B: Malawi, Zambia, Tanzania (heavy restriction of trade)
  - Borderline case: Kenya (initially restricting trade, progressively open border policy, especially since January 2005)
Data and Methods

- Unconditional CV: measure of price variability
- Conditional CV: measure of price *unpredictability* via the magnitude of one-month ahead forecast error, given known information on:
  - last month’s local & international maize price
  - local maize production index a proxy for rainfall index
  - normal seasonal price movements
  - Last month exchange rates
  - Interest rates (not included due to data problems)

### Table 1: Timing of major different policy regimes

<table>
<thead>
<tr>
<th>Country</th>
<th>Phase 1</th>
<th>Phase 2</th>
<th>Phase 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tanzania</td>
<td>Jan 1994 to Dec 2004 (Reform phase)</td>
<td>Jan 2005 to current (Beginning of on/off Export bans)</td>
<td>-</td>
</tr>
<tr>
<td>Zambia</td>
<td>Jan 1994 to Apr 2000 (Reform phase)</td>
<td>May 2001-Apr 2005 (FRA became one of the major players in the maize market)</td>
<td>May 2005- current (FRA ramping up its activities prior to an election)</td>
</tr>
<tr>
<td>Malawi</td>
<td>Jan 1994 to Mar 2005 (Reform phase)</td>
<td>April 2005 to current (ASIP Ag Input Subsidy Program)</td>
<td>-</td>
</tr>
<tr>
<td>South Africa, Mozambique and Uganda</td>
<td>--------------------</td>
<td>Constant policy regime over period ------------------</td>
<td>----------------------------------------------</td>
</tr>
</tbody>
</table>
Finding 1

- Higher maize production and yield growth in countries having open borders compared to countries that pursue interventionist policies and restrict grain trade.

Maize Production growth rates, 1990 to 2007, Sub-Saharan Africa* and selected countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zambia</td>
<td>-0.7</td>
</tr>
<tr>
<td>Malawi</td>
<td>4.1</td>
</tr>
<tr>
<td>Tanzania</td>
<td>1.7</td>
</tr>
<tr>
<td>Kenya</td>
<td>1.2</td>
</tr>
<tr>
<td>SSA*</td>
<td>1.9</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.2</td>
</tr>
<tr>
<td>Mozambique</td>
<td>10.1</td>
</tr>
<tr>
<td>Uganda</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Source: FAOStat
Maize yield growth rates, 1990 to 2007, Sub-Saharan Africa* and selected countries

![Graph showing maize yield growth rates from 1990 to 2007 for Sub-Saharan Africa and selected countries.]

Source: FAOStat

Finding 2

- Maize grain prices are generally more unstable in countries that pursue interventionist policies and restrict grain trade than those with open borders
- Highest in Malawi and Zambia
Coefficient of Variation: Maize Grain Prices Instability

Finding 3

- Maize grain prices are generally **no more predictable** in countries that restrict grain trade than in countries having open borders
  - conditional CVs:
    - Highest in Malawi and Zambia
    - Moderately high in Mozambique, Tanzania, Uganda
    - Lowest in Kenya, South Africa
Maize Grain Prices Unpredictability

Table 3: Index of Unpredictability in Monthly Maize Prices

<table>
<thead>
<tr>
<th>Country</th>
<th>Market</th>
<th>Full Sample 1994-2008</th>
<th>Period 1</th>
<th>Period 2</th>
<th>Period 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malawi</td>
<td>Lilongwe</td>
<td>16.08</td>
<td>14.53</td>
<td>20.83</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Karonga</td>
<td>12.26</td>
<td>10.33</td>
<td>18.20</td>
<td>-</td>
</tr>
<tr>
<td>Zambia</td>
<td>Lusaka</td>
<td>10.76</td>
<td>9.42</td>
<td>13.32</td>
<td>8.75</td>
</tr>
<tr>
<td></td>
<td>Choma</td>
<td>11.92</td>
<td>13.66</td>
<td>14.58</td>
<td>6.71</td>
</tr>
<tr>
<td>Tanzania</td>
<td>Dar es Salaam</td>
<td>7.94</td>
<td>7.47</td>
<td>9.19</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Mbeya</td>
<td>10.16</td>
<td>7.75</td>
<td>18.62</td>
<td>-</td>
</tr>
<tr>
<td>Kenya</td>
<td>Nairobi</td>
<td>5.13</td>
<td>5.12</td>
<td>6.21</td>
<td>4.03</td>
</tr>
<tr>
<td></td>
<td>Nakuru</td>
<td>7.35</td>
<td>9.71</td>
<td>5.84</td>
<td>4.86</td>
</tr>
<tr>
<td>Mozambique</td>
<td>Maputo</td>
<td>7.83</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Nampula</td>
<td>12.16</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Uganda</td>
<td>Kampala</td>
<td>9.79</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Mbala</td>
<td>11.80</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>South Africa</td>
<td>Randfontein</td>
<td>6.42</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>
Fig 1. Conditional CV, Lilongwe

Fig 2. Conditional CV, Lusaka
Fig 2. Conditional CV, Dar es Salam

Dar es Salam-Tanzania

Fig 2. Conditional CV, Nairobi

Nairobi-Kenya
Conclusion:

- Despite theoretical rationale for price stabilization and controlling trade to stabilize food supplies, countries that rely on “maize without borders” generally have
  - more stable prices
  - higher cereal production growth
  than countries actively intervening to stabilize prices

- Government operations in markets are costly. Little evidence that these costs incurred provide tangible improvements in price stability or predictability.

- While private trading systems will always result in some price variability, they tend not to cause the frequent food crises caused by ad hoc government actions (Model 3) that are commonly seen in the region.

Why Does this Conclusion Hold?

1. Private trade develops more slowly and more tentatively in countries where government policy is unpredictable
2. Cutting off trade depresses the long-term development of commercial markets
3. If governments intervenes too heavily, then markets will not develop
4. Governments’ well-meaning attempts to stabilize prices through various interventions may actually destabilize them if they cannot mobilize forex quickly enough, over-release supplies onto markets, buy too much from the market, etc. These problems can be categorized as two types: (i) coordination failures; (ii) information failures
Conclusions

- Improve government-private coordination to improve markets and reduce price instability
- Clearly defined and transparent rules for triggering government intervention
- Greater role for rule-based public sector participation in less-favored areas with poor market access
- With increased investment in governance and institutions, Model 2 may be more feasible and is likely to be a preferred strategy.

Thank You