Are staple food markets in Africa efficient?

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Outline

- Concepts (and Mis-concepts) of market efficiency
- Market integration and market efficiency
- Determinants of market efficiency
- Measure of market efficiency
- Results from existing studies
  - How useful are these results?
  - Reconciling with survey data
- Summary
Concepts (and mis-concepts)

- Misconception: “Price variability is a symptom of market inefficiency.”
- In fact, price variability is necessary for the very existence of the market because price variability provides people with incentives in engage in trade!
- Excessive variability may be a symptom of market efficiency
- ... but lack of variability can also be a symptom of market inefficiency

Market integration and market efficiency

- Market integration: Two markets are said to be integrated if the prices move together (“co-movement”)

- Market efficiency:
  - Exchange efficiency:
    - There are no unexploited opportunities for mutually beneficial trade
    - Price differences ≤ Full cost of marketing
  - Operational efficiency:
    - There is no room for reducing marketing cost below existing level
Market integration and market efficiency

- Misconception: “Market integration implies market efficiency and vice versa”
- In fact, it’s possible to have market integration without market efficiency
- Also possible to have market efficiency without market integration

Illustration 1: Markets can be efficient but not integrated.

- Marketing cost between A and B is larger than price difference
- → No trade because not profitable
- → Markets are not connected so no co-movement of prices
- Thus, markets are efficient (no missed opportunities) but not integrated (no co-movement)
Market integration and market efficiency

Illustration 2: Markets can be integrated but not efficient

- Suppose cartel maintains price difference at 2x the actual marketing cost
- Markets are integrated (co-movement of prices)
- ...but not efficient (price difference is greater than marketing costs)

![Graph showing price and marketing cost differences between markets A and B over time.](image)

Illustration 3: Markets can be integrated, but not efficient

- Market A is surplus and B & C are deficit. There is no direct trade between A and C, but trade flows from A→B→C
- Markets are integrated, but not efficient because costs can be reduced by promoting direct trade.

![Diagram showing integrated markets A, B, and C with no direct trade between A and C.](image)
Determinants of market efficiency

- Better process of exchange $\rightarrow$ better market efficiency, which depends on:
  - Infrastructure, Information, Institutions
  - Law, regulations, contract enforcements
  - Public policies—food policies, trade policies, etc.

Measuring market integration & efficiency

- Market integration analyses has evolved
  - From simple price correlation analysis
  - To complex cointegration analysis and parity bound models.
- Recent studies rely on variants of cointegration and parity bound models.
- Some recent studies include estimates of marketing costs
- However, none of the existing methods captures the full intricacies of the market efficiency.
## Methods for measuring market integration

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Analytical method</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Correlation</td>
</tr>
<tr>
<td>Measures co-movement of prices</td>
<td>Yes, but has statistical problems</td>
</tr>
<tr>
<td>Can include more than two markets</td>
<td>No</td>
</tr>
<tr>
<td>Can measure speed of adjustment</td>
<td>No</td>
</tr>
<tr>
<td>Takes into account transfer costs</td>
<td>No</td>
</tr>
<tr>
<td>Can make use of info on marketing costs</td>
<td>No</td>
</tr>
<tr>
<td>Can identify market inefficiency</td>
<td>No</td>
</tr>
</tbody>
</table>

- Market integration has improved following liberalization in both East and Southern African countries.
- Markets function relatively well, following the rules of spatial arbitrage in the long run but with significant deviations in the short run.
- Market integration breaks down when markets are separated by long distances and poor infrastructure, though this does not necessarily indicate imperfect competition in food markets.
How useful are the results in terms of policy guidance?

- Most of the studies test if the markets are integrated or not.
- Many stop at giving a “Yes” or “No” answer.
- If the answer is “No”, studies do not tell us “why”. If “yes”, we hardly know anything about efficiency.
- They tell very little about reasons behind inefficiency.

Answers to “Why Not” are critically important for policy guidance.

Things that existing studies do not tell us

- Staple food markets in SSA are evolving and becoming more competitive.

<table>
<thead>
<tr>
<th>Regions and Districts of Uganda</th>
<th>Years in the agricultural trading</th>
<th>Number of competitors</th>
<th>Percent of transactions on credit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Central Region</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Kampala</td>
<td>5.1</td>
<td>59</td>
<td>109</td>
</tr>
<tr>
<td>Luwero</td>
<td>6.5</td>
<td>84</td>
<td>49</td>
</tr>
<tr>
<td>Masaka</td>
<td>5.3</td>
<td>37</td>
<td>55</td>
</tr>
<tr>
<td>Mpiigi</td>
<td>6.7</td>
<td>30</td>
<td>40</td>
</tr>
<tr>
<td>Mukono</td>
<td>7.6</td>
<td>55</td>
<td>42</td>
</tr>
</tbody>
</table>
Reconciling with survey / other data

- Contrary to existing study results, surveys indicate market **inefficiency**
- There seems to be more stops than necessary between surplus and terminal market locations

<table>
<thead>
<tr>
<th>Countries / Indicators</th>
<th>Farm gate to primary</th>
<th>Primary-secondary</th>
<th>Secondary-wholesale</th>
<th>Total or average</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ethiopia</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance travelled (km)</td>
<td>28.48</td>
<td>61.32</td>
<td>67.76</td>
<td>158.0</td>
</tr>
<tr>
<td>Transport cost (US$/km-mt)</td>
<td>0.30</td>
<td>0.20</td>
<td>0.18</td>
<td>0.15</td>
</tr>
<tr>
<td>Transport as % of total</td>
<td>15%</td>
<td>17%</td>
<td>30%</td>
<td>--</td>
</tr>
<tr>
<td>Kenya</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distance travelled (km)</td>
<td>6</td>
<td>67</td>
<td>300</td>
<td>373.0</td>
</tr>
<tr>
<td>Transport cost (US$/km-mt)</td>
<td>0.30</td>
<td>0.30</td>
<td>0.11</td>
<td>0.15</td>
</tr>
<tr>
<td>Transport as % of total</td>
<td>19%</td>
<td>65%</td>
<td>39%</td>
<td>--</td>
</tr>
</tbody>
</table>

Reconciling with survey / other data

- Contract enforcement is time consuming

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Ethiopia</th>
<th>Ghana</th>
<th>Kenya</th>
<th>Malawi</th>
<th>Zambia</th>
<th>Uganda</th>
<th>OECD</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Procedures</td>
<td>30</td>
<td>22</td>
<td>25</td>
<td>40</td>
<td>21</td>
<td>19</td>
<td>22</td>
</tr>
<tr>
<td>Days to process</td>
<td>690</td>
<td>730</td>
<td>360</td>
<td>337</td>
<td>404</td>
<td>484</td>
<td>252</td>
</tr>
<tr>
<td>Cost as % of debt recovered</td>
<td>14.8</td>
<td>12.7</td>
<td>41.3</td>
<td>36.5</td>
<td>28.7</td>
<td>35.2</td>
<td>11.2</td>
</tr>
</tbody>
</table>
Macro / trade policy induced effects are not captured in spatial price analyses

- In 2008-09, domestic price of wheat in Ethiopia went $200 above the import parity due to macroeconomic policy factors.
- Spatial price analyses would not capture this because domestic prices went up in all locations within the county.

Summary (1)

- Spatial price variability is a natural market phenomenon; and it is needed for the very existence of market
- It’s the extreme variability and “no variability” that should be the policy concerns
- There has been substantial improvement in spatial price analyses methods, but none of them seems to capture the full range of the determinants of market efficiency.
Summary (2)

- Existing studies find spatial markets in Eastern and Southern Africa to function well, at least in the long run. However, the results of studies (and other spatial price analyses around the world)
  - Do not offer clear policy guidance
  - Contradict with the survey data, where they are available.
- In order to devise polices / investment strategies, analysis has to go beyond spatial price analyses and pay more attention to specific analyses of market structure and performance—be it staple or other commodities.