Rice mountain
Assessment of the Thai rice pledging program

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Thai rice policy

- 50% price premium to local producers
- Large build-up of stocks
- Hoping to drive up world prices
- Prices fell instead
- Stocks deteriorate in quality
Outline

• The industry
• The policy
• Analytical framework
• Results
• Implications
## The industry

<table>
<thead>
<tr>
<th>Category</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Production (kt)</td>
<td>20,262</td>
</tr>
<tr>
<td>Imports (kt)</td>
<td>200</td>
</tr>
<tr>
<td>Exports (kt)</td>
<td>10,647</td>
</tr>
<tr>
<td>Consumption (kt)</td>
<td>10,300</td>
</tr>
<tr>
<td>Ending stocks (kt)</td>
<td>5,615</td>
</tr>
<tr>
<td>Prices $/t</td>
<td>486</td>
</tr>
</tbody>
</table>
Production and consumption

![Graph showing production and consumption trends from 1960 to 2010. The x-axis represents the years (1960 to 2010), and the y-axis represents production and consumption in thousands of metric tons (MT). The graph includes two lines: one for production in black and one for domestic consumption in dashed black. The production line shows a steady increase, while the domestic consumption line shows a more erratic pattern but also increasing overall.](chart.png)
Declining export share

Rice export share

- Thailand
- Vietnam
- India
Falling export prices
2003-2013

Thai rice price

Rice, 5 percent broken milled white rice, Thailand nominal. Source IMF
Analytical framework

• Single commodity partial equilibrium model
• Non-linear
• Ten regions
• Dynamic
• Stochastic
• Stocks, private and public
Domestic floor price

[Diagram showing supply and demand for Thailand and Rest of World with quantities and prices labeled as $Q_d$, $Q_s$, $P_d$, $P_w$]
Government options

• Pledging scheme
  50% increase in floor price

• Stock purchase
  Government buys 10 mmt over each of three years.

• Stock sell-off
  Government sells 18% of current stock per year over five years

• Farmer income support
  Decoupled cash transfers to poor farmers
## Results

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
<th>Pledging scheme</th>
<th>Stock purchase</th>
<th>Stock sell-off</th>
<th>Producer support</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Output</strong></td>
<td>kt</td>
<td>20.3</td>
<td>22.7</td>
<td>23.0</td>
<td>22.5</td>
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<tr>
<td><strong>Consumption</strong></td>
<td>kt</td>
<td>10.3</td>
<td>9.4</td>
<td>9.3</td>
<td>9.5</td>
</tr>
<tr>
<td><strong>Exports</strong></td>
<td>kt</td>
<td>10.0</td>
<td>13.2</td>
<td>3.7</td>
<td>18.5</td>
</tr>
<tr>
<td><strong>Stocks - private</strong></td>
<td>kt</td>
<td>2.8</td>
<td>0.0</td>
<td>-</td>
<td>1.1</td>
</tr>
<tr>
<td><strong>Stocks – Govt</strong></td>
<td>kt</td>
<td>2.8</td>
<td>2.8</td>
<td><strong>30.0</strong></td>
<td>2.8</td>
</tr>
</tbody>
</table>
## Price effects

<table>
<thead>
<tr>
<th></th>
<th>Baseline</th>
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<th>Stock sell-off</th>
<th>Producer support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Domestic price $/t</td>
<td>567</td>
<td>805</td>
<td>870</td>
<td>792</td>
<td>567</td>
</tr>
<tr>
<td>World price $/t</td>
<td>520</td>
<td><strong>505</strong></td>
<td>555</td>
<td>497</td>
<td>520</td>
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</tbody>
</table>
## Welfare change

<table>
<thead>
<tr>
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<th>Stock purchase</th>
<th>Stock sell-off</th>
<th>Producer support</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer surplus</td>
<td>$b</td>
<td>-2.4</td>
<td>-3.0</td>
<td>-2.2</td>
</tr>
<tr>
<td>Producer surplus</td>
<td>$b</td>
<td>5.1</td>
<td>6.6</td>
<td>4.8</td>
</tr>
<tr>
<td>Govt revenue</td>
<td>$b</td>
<td>-3.8</td>
<td>-5.2</td>
<td>-5.4</td>
</tr>
<tr>
<td>Speculative profits</td>
<td>$b</td>
<td>0.3</td>
<td>2.9</td>
<td>-</td>
</tr>
<tr>
<td>Welfare</td>
<td>$b</td>
<td>-0.8</td>
<td>-9.9</td>
<td>1.7</td>
</tr>
</tbody>
</table>
Policy implications

• Policy failed because:
  • Storage is expensive (17%)
  • Competing exporters (Vietnam and India) responded

• Govt stocks crowd out private stocks
• Benefits leak to foreign consumers
• Decoupled targeted income support preferred
The End
Model equations

- Demand
  \[ D = aP^b \]
- Supply
  \[ S = cE(P)^d \]
- Expected price
  \[ E(P) = w_1P^{(t-1)} + w_2P^{(t-2)} + w_3P^{(t-3)} \]
- Price linkage
  \[ P = t + e \cdot Pw \]
• Private

\[ \text{EPS} = \rho (E(P) - P) + \text{OPS} \]

where \( \rho = (1-f-g)\sigma \frac{S}{P} \)

• Government

\[ \text{EGS-OGS} = \lambda (P_{\text{min}} - P) \text{ if } P < P_{\text{min}} \]
\[ = \lambda (P_{\text{max}} - P) \text{ if } P > P_{\text{max}} \]
\[ = 0 \text{ if } P_{\text{min}} > P > P_{\text{max}} \]
Market clearing
\( \text{D-S+OPS+OGS-EPS-EGS=0} \)

Welfare
\( W=\text{CS + PS + GR} \)

Risk aversion
\( t_i = -0.5 \left[ \frac{\sigma^2_i}{P^*_i} s_i (\eta_i - r_i) - \beta_i \right] \)