THAI AGRICULTURAL POLICIES: THE RICE PLEDGING SCHEME

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Population works in agricultural sector.
Agricultural Development under national economic and social development plan

Plan No. 1-3 (1961-1976)
- solving problems of logistics cost for agricultural products
- building the country's foundation and infrastructure

Plan No. 4-6 (1977-1991)
- started to implement the concept of commercialized agriculture, concentrating specially on production
- green revolution

Plan No. 7-10 (1992-2011)
- philosophy of sufficiency economy
- sustainable agriculture
- environmental quality and the natural resources
Concept of Smart Farmer under Current development Plan (2012-2016)

1. Data Access for Utilization
2. Knowledge Base
3. Planning & Feasibility Study
4. Management (production & market)
5. Food Safety
6. Green Economy
7. Proud to Be Farmer

**Goal**
- Improve Productivity
- Income (>180,000 baht/household)
- Balance Demand & Supply
- Competitiveness
- Value Creation
- Logistics Cost

**Smart Farmer**

**1. Data Access for Utilization**
- MOAC TV/IPTV
- R&D, S&T

**2. Knowledge Base**
- Information Center
- MOAC TV/IPTV

**3. Planning & Feasibility Study**
- Zoning (land use, land suitable)
- Informatio n Center

**4. Management (production & market)**
- 1.Data Access for Utilization
- 2.Knowledge Base
- 3.Planning & feasibility Study

**5. Food Safety**
- Smart Officers/ID Card
- Informatio n Center

**6. Green Economy**
- Smart Officers/ID Card
- Informatio n Center

**7. Proud to Be Farmer**
- Zoning (land use, land suitable)
- MOAC TV/IPTV

**Additional Features**
- Green City: reduce reuse recycle recovery low carbon
- National Surveillance
- Soft Loan, DC, Seed. Hub, Mechanic center, Cropping pattern
- Standardize & Certification, Harmonize
Crucial Agricultural Policies under these development plans

- Production policy
  - Promoting quality of agricultural products
- Price intervention policy
  - Crop insurance
  - Revenue assurance
  - Pledging program
Rice is a major crop for domestic consumption and production (6th in 2011)
Thailand is the biggest rice exporting country (10.5 million tons in 2011)
Threatened by higher production cost and competition from Vietnam, India, Pakistan and USA
Objective: not only to improve income and living standards of Thai farmers via raising domestic rice prices, but also to increase Thai rice export prices.

The government believe that Thailand has market power to control prices in global rice market.
"the stockpiles of paddy is rising up to 14.7 million tones, and the budgetary spending on the rice pledging scheme for the past full year stood at 300 billion Baht” - Petchanet Pratruangkai, The nation, March 14, 2013
Some Critics against the policy

- “The Thai government has two options in handling the surplus rice, which must sell aboard at up to $870 per ton, well above the current market price of $640 per ton, if it is to avoid substantial loss. It can either stockpile rice in hope that the global price will rise, or it can export at below subsidized prices that would cost Thai taxpayers billions of dollar.” – Michael Richardson, Institute of South East Asian Studies.

- “These (rice) prices are simply the result of political distortion and they are too high to be sustained... A sustainable price is determined by the market, not the government.” (Sustainable rice prices are set by the market, Viroj Naranong in Bangkok post, 19 June 2013)
• Can Thailand exploit their market power to manipulate rice prices in their export markets?
• This study focuses on main rice export destinations including China, Indonesia, USA, and South Africa

Statements of the problem
Graphical Analysis of competition in rice export market

Thai rice export

Rival rice export

$P^{\text{ex}}$, $P^{k}$, $Q^{\text{ex}}$, $Q^{k}$, $S_{\text{new}}$, $S_{\text{old}}$, $D_{\text{new}}$, $D_{\text{old}}$
1. Demand elasticity
   - Necessary good?
   - Differentiated quality?

2. Supply elasticity
   - Number of sellers
   - Supply response of sellers
Theoretical Framework

• Suppose that Thai rice and competitors’ rice are heterogeneous products

\[ p^{ex} = D^{ex}\left(Q^{ex}, p^1, ..., p^n, Z\right) \]  \hspace{1cm} (1)

\[ p^k = D^k\left(Q^k, p^{ex}, p^j, Z\right) \]  \hspace{1cm} (2)  \text{for } k, j = 1,2, ..., n

• Suppose that Thai rice exporters want to maximize their mutual profit

\[ \max_{Q^{ex}} \Pi^{ex} = p^{ex} \cdot Q^{ex} - e \cdot C^{ex} \]

• The first order condition is

\[ p^{ex} + Q^{ex} \left( \frac{\partial D^{ex}}{\partial Q^{ex}} + \sum_{j=1}^{n} \frac{\partial D^{ex}}{\partial p^j} \frac{\partial p^j}{\partial Q^{ex}} \right) - e \cdot MC^{ex} = 0 \]  \hspace{1cm} (3)
• Profit maximizing condition for the k\textsuperscript{th} exporter

\[ p^k = -\vartheta^k \cdot Q^k + e^k \cdot MC^k \]  \hspace{1cm} (4)

when \[ \vartheta^k = \frac{\partial D^k}{\partial Q^k} + \left( \frac{\partial D^k}{\partial p^e} \right) \left( \frac{\partial p^e}{\partial p^k} \right) + \sum_{j=1}^{n} \left( \frac{\partial D^k}{\partial p^j} \right) \left( \frac{\partial p^j}{\partial Q^k} \right) \]

• Given that \[ MC^k = f\left( W^k, Q^k \right) \], we can rewrite (4) as

\[ Q^k \left( Q^e, p^1, \ldots, p^n, e^1, \ldots, e^n, W^1, \ldots, W^n, Z, \vartheta^k \right) \]

• Plug this into equation (2) to get

\[ p^k = D^k \left( Q^e, e^1, \ldots, e^n, W^1, \ldots, W^n, Z, \vartheta^1, \ldots, \vartheta^n \right) \]  \hspace{1cm} (5)

Substitute (5) into (1), we get

\[ p^e \equiv D^e \left( Q^e, p^1, \ldots, p^n, Z \right) \]  \hspace{1cm} (6)

• Or

\[ p^e \equiv D^{res} \left( Q^e, e^N, W^N, Z \right) \]  \hspace{1cm} (7)
The residual demand function

\[ p^{ex} = D^{res} \left( Q^{ex}, e^N, W^N, Z \right) = D^{ex} \left( Q^{ex}, p^{1*}, \ldots, p^{n*}, Z \right) \]

- Taking log and differentiate wrt. \( Q^{ex} \)

\[
\frac{\partial \ln p^{ex}}{\partial \ln Q^{ex}} = \frac{\partial \ln D^{ex}}{\partial \ln Q^{ex}} + \sum_{k=1}^{n} \frac{\partial \ln D^{ex}}{\partial \ln p^{k*}} \frac{\partial \ln p^{k*}}{\partial \ln Q^{ex}} = \eta \quad \text{(8)}
\]

How much is change in \( p^{ex} \), resulting from change in \( Q^{ex} \) (direct effect)

How much is change in \( p^{ex} \), resulting from change in competitors’ sell (indirect effect)
$\ln p_{mt}^e = \alpha_m + \eta_m \ln Q_{mt}^e + \beta_m \ln GDP_m + \delta_m t + \phi_m t^2 + \phi_m \ln PPI_{mt} + \gamma_m \ln EXR_{mt} + \varepsilon_{mt}$

- $P_{mt}^e$ = Thai rice export price in destination m
- $Q_{mt}^e$ = Thai rice export quantity in destination m
- $GDP_{mt}$ = Real GDP in destination m
- $t$ = Time trend
- $PPI_{mt}$ = Producer price index in destination m
- $EXR_{mt}$ = Exchange rate of destination m currency per unit of rival rice exporter currency (VND or INR)
• Note that $Q^{ex}$ is an endogenous variable which is in the RHS of the residual demand equation.
• $\text{COV}(Q^{ex}, \varepsilon) \neq 0$
• If OLS is used, the estimate of $\eta$ will be biased and inconsistent.
• So, we have to use the Three Stage Least Square (3SLS) method to estimate residual demands in all destinations simultaneously.
• $Q^{ex}$ must be instrumented by all RHS exogenous variables as well as Thailand cost shifters including Thai Baht exchange rate, Thailand’s PPI, and Rainfall.

Econometric estimation issues
Market share of rice exports in 4 major export destinations

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Source: computed from World Trade Atlas data
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<td>(0.26)</td>
<td>(p-value = 0.08)</td>
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<tr>
<td>$\ln EXR_{INR}$</td>
<td>-</td>
<td>-</td>
<td>1.64***</td>
<td>0.63*</td>
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<td>(0.55)</td>
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<td>R squared</td>
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<td>Sargan statistic</td>
<td>19.57 (p-value = 0.08)</td>
<td>19.57 (p-value = 0.08)</td>
<td>15.79 (p-value = 0.20)</td>
<td>15.79 (p-value = 0.20)</td>
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• 1. When consider the overall rice export, Thailand has no market power to influence the export prices in China, Indonesia, USA, and South Africa. Instead, Thailand faces fierce competition from Vietnam and India whose rice exports are very close substitutes for Thai rice.

• 2. Thailand will ultimately have to liquidate generic rice in warehouses at the world market price which is substantially lower than its pledging price. All losses incurred by the rice pledging scheme will inevitably be borne by the taxpayers.

• 3. An appropriate policy toward rice production in Thailand should be agricultural productivity enhancement through infrastructure development and farmers’ capacity building such as education and training rather than permanent production subsidy or price supports.