Rice Farmer’s Preferences towards Marketing Policy Alternatives in Thailand

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Introduction

Thai policymakers are currently debating whether price support program (PSP) or deficiency payment program (DPP) should be implemented in the rice sector as means to improve farmers’ farm income.

None of existing studies attempts to estimate the impact of PSP and DPP on the distribution of rice price. As a result, farmer preference towards these programs for conditional price distribution has not been examined.

To rank farmer’s preference towards a set of farm policies a risk-ranking criterion called “stochastic efficiency with conditional price distribution” has not been examined.

This study chooses the 2006/07 production year, in which SERF ranks the farmer’s preference based on certainty (CE values) associated with each scenario.

Empirical Models

- VAR model specification is as follows.
  \[
  \text{log} P_t = \sum_{i=1}^{\lambda} a_i \text{log} P_{t-i} + \sum_{i=1}^{\lambda} a_i X_{t-i} + \sum_{i=1}^{\lambda} a_i E P_{t-i} + U_t
  \]
  \( P_t \) is a vector of rice prices in period \( t \) (in logarithmic form) \( X_t \) is a vector of rice prices from period \( t-i \) to \( t-\lambda \) (in logarithmic form) \( E P_t \) is a vector of error terms \( A, B, C \) are matrix of coefficients

- Net revenue (NR) under each scenario is specified as follows
  \[
  \text{NR} = (A) P_{0,t}^\text{dpp} - AC
  \]
  \( A \) is planted area (acres) \( Y \) is yield distributed as lognormal based on historical values of national averages

Scenario 1: no government intervention (NG)
  \[
  \text{NR} = (A) P_{0,t}^\text{ng} - AC
  \]
  \( P_{0,t}^\text{ng} \) is support price (baht/ton)

Scenario 3: deficiency payment program (DPP)
  \[
  \text{NR} = (A) P_{0,t}^\text{dpp} + A^2 (\text{Max}(P - P_{0,t}^\text{dpp}), 0) - AC
  \]
  \( P_{0,t}^\text{dpp} \) is support price (baht/ton)
  \( P \) is market price (baht/ton)
  \( r \) is maximum lending rate (%)
  \( t \) is number of days before receiving loans

- Expected Utility under power utility function:
  \[
  E(U) = \sum_p p_i (\text{NR}_i + W^{1/R_i})
  \]
  \( C \) is coefficient of risk aversion ranging from 0.5 to 4

Research Question

- Does PSP and DPP result in different distributions of market price (farm-gate price)?
- If so, what is the ranking of farmer preferences towards these programs?

Methods

- Use vector autoregressive model (VAR) to estimate the impact of PSP and DPP on mean and variance of market price of Thai rice in domestic market.
- The model variables include farm-gate price of Thai rice, export price of rice from major exporting countries, a set of exogenous variables, and a set of dummy variables representing different policy regimes (i.e. PSP and DPP).
- Monthly prices (1998 - 2012) aggregated to semiannual basis are obtained from Thailand Office of Agricultural Economics.
- Conditional mean and variance of market price computed from the VAR model are used to simulate net revenues of a representative farm under three hypothetical scenarios, namely PSP, DPP, and no intervention (NG).
- The representative farm is assumed to face stochastic yield generated from a series of average national yield.
- SERF ranks the farmer’s preference based on certainty (CE) values associated with each scenario.
- This study chooses the 2006/07 production year, in which PSP was implemented, to investigate the ranking.

Results and Discussions

Table 1: Parameter estimates from the Thai rice price equation (dep. variable) obtained from VAR model

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>5.069***</td>
</tr>
<tr>
<td>Thai rice prices (_{t-1})</td>
<td>-0.116</td>
</tr>
<tr>
<td>Thai rice prices (_{t-2})</td>
<td>0.378**</td>
</tr>
<tr>
<td>Vietnam rice prices (_{t-1})</td>
<td>-0.246*</td>
</tr>
<tr>
<td>Vietnam rice prices (_{t-2})</td>
<td>0.070**</td>
</tr>
<tr>
<td>Pakistan rice prices (_{t-1})</td>
<td>0.614***</td>
</tr>
<tr>
<td>Pakistan rice prices (_{t-2})</td>
<td>0.663***</td>
</tr>
<tr>
<td>PSP (PSP mandated=1, zero otherwise)</td>
<td>0.143***</td>
</tr>
<tr>
<td>Season (1st season=1, 2nd season=0)</td>
<td>0.025</td>
</tr>
<tr>
<td>Period before2008 (yes=1, zero otherwise)</td>
<td>0.090</td>
</tr>
<tr>
<td>Period during 2008 (yes=1, zero otherwise)</td>
<td>0.533***</td>
</tr>
<tr>
<td>Period After2008 (yes=1, zero otherwise)</td>
<td>0.301***</td>
</tr>
</tbody>
</table>

***,**, * denote significant levels at 1%, 5%, 10%, respectively

- PSP raises market price by 14.3% on average while the market price falls by 2% under DPP. However, the impact of DPP is not statistically significant.

Table 2: Simulated market price of Thai rice in 2006/07

<table>
<thead>
<tr>
<th>Regime</th>
<th>Support Price</th>
<th>Market Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>Std</td>
<td></td>
</tr>
<tr>
<td>PSP</td>
<td>6,500</td>
<td>6,209</td>
</tr>
<tr>
<td>NG</td>
<td>NA</td>
<td>5,405</td>
</tr>
<tr>
<td>DPP</td>
<td>NA</td>
<td>4,807</td>
</tr>
</tbody>
</table>

Both PSP and DPP completely dominate NG; the farmer requires approximately 30,000 baht in order to switch from either PSP or DPP to NG. PSP is preferred over DPP for the range of RAC that defines a class of risk-averse individuals. However, the ranking starts to switch at high value of RAC (highly risk-averse farmer) as indicated by the cross of the CE lines.

Table 3: Summary of simulated net revenue

<table>
<thead>
<tr>
<th>Regime</th>
<th>Mean</th>
<th>Std</th>
</tr>
</thead>
<tbody>
<tr>
<td>NG</td>
<td>98,232</td>
<td>27,174</td>
</tr>
<tr>
<td>PSP</td>
<td>129,335</td>
<td>28,622</td>
</tr>
<tr>
<td>DPP</td>
<td>125,547</td>
<td>23,042</td>
</tr>
</tbody>
</table>

- PSP and DPP substantially increase net revenue. PSP yields the highest mean of net revenue but at the cost of having highest variance. All risk-averse farmers would prefer DPP to NG due to higher mean but smaller variance. Since CDFs of net farm revenue under PSP and DPP will cross at least once, mean-variance analysis is not applicable and SERF is called for.

Conclusions

- The impacts of price support program (PSP) and deficiency payment program (DPP) on the distribution of market price differ significantly.
- PSP results in higher market price and variance while DPP lowers both.
- Most risk-averse farmers, who produce at average national yield, would prefer PSP to DPP despite risks associated with delayed payments.
- Only the most risk-averse farmers would prefer DPP over PSP. Yet, the difference in the preferences is minimal as indicated by small premium (the difference in CE).
- Given high criticism regarding the efficiency and corrupsion associated with PSP, the government may consider replacing the program with DPP as they both yield almost the same preference to farmers.

References


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