Market participation decisions and market choices: A case study of Bolivian potato farmers

Catherine Larochelle and Jeffrey Alwang, Department of agricultural and applied economics, Virginia Tech
International Association of Agricultural Economists (IAAE) Triennial Conference, Foz do Iguacu, Brazil, 18-24 August, 2012.

Introduction

- Potato production is vital for impoverished households in the Bolivian Andes.
- Potato sales represent 79.5% of crop revenue and 49.5% of total household revenue.
- Market participation can be an useful tool to lift small-scale farmers out of semi-subsistence farming and escape poverty.

Identifying obstacles to market participation and factors to promote participation in higher-valued markets is necessary to increase farmers’ income and welfare.

Study Area

Bolivia

Household and Market Location

Methods

Simultaneous system of 3 equations with selectivity and a recursive equation:

\[ y_1 = f(x_1, x_2, x_3, x_4, x_5, \gamma) + \mu_1 (\mu_1 + \mu_2 + \mu_3) - N(0, \Sigma) \]

\[ y_2 = f(x_2, x_3, x_4, \beta) + \mu_2 \]

\[ y_3 = f(x_1, x_2, x_3, x_4, \delta) + \mu_3 \]

\[ \Sigma = \begin{bmatrix} \sigma_{11} & \sigma_{12} & \sigma_{13} \\ \sigma_{21} & \sigma_{22} & \sigma_{23} \\ \sigma_{31} & \sigma_{32} & \sigma_{33} \end{bmatrix} \]

\[ \rho_{12}, \rho_{13}, \rho_{23} \neq 0 \]

Research questions

1. What is needed to simulate small-scale farmers market participation and volume sold?
2. What is needed to improve marketing performance?

Data

- Survey data on potato farmers
- Data on agricultural activities, market participation, household characteristics, etc.
- GIS data for road network, elevation, soil, etc.
- Market participation and quantity sold
- 317 households sold an average of 4914 kg (5881) of potato
- Optimal market choice: Optimal marketing strategies include: 1) Santa Cruz, 2) Cochabamba, 3) Punata/Tiraque/Cochabamba, and 4) Punata/Tiraque/Santa Cruz.
- 36 households selected an optimal marketing strategy

Analytical framework

- Quantity sold
- Optimal market choice

Results

<table>
<thead>
<tr>
<th>Market participation</th>
<th>Quantity sold</th>
<th>Optimal market choice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radio ownership</td>
<td>Increases the probability of market participation by 6.5%.</td>
<td>NA</td>
</tr>
<tr>
<td>An one unit increase in population density increases (population/0.8 km²) the probability of joining the market by 0.6 percent.</td>
<td>NA</td>
<td></td>
</tr>
<tr>
<td>Fixed transaction costs</td>
<td>NA</td>
<td></td>
</tr>
</tbody>
</table>

Proportional transaction costs

- Living 1 km further away from Tiraque and Santa Cruz markets decreases market participation by 1.1% and 0.02% respectively.
- Living 1 km further away from the Tiraque and Santa Cruz markets decreases quantity sold by 288 kg and 9 kg respectively.

Determinants of household supply of potato

- Selling an additional 1,000 kg of potato increases the likelihood of selecting an optimal marketing strategy by 13.9% and 0.2% respectively.

Determinants of household demand for potato

- An additional child decreases the probability of market participation by 1.3%.

Household characteristics

- Households whose head attended secondary school are 11.9% more likely to participate in the market compared to households whose head has no formal education.
- Being a female household head reduces the quantity sold by 519 kg. Primary education of the household head increases quantity sold by 574 kg compared to no education.
- Primary education of the household head increases the probability of selecting an optimal marketing strategy by 4.6% compared to no education.
- An one-year increase in the age of the household head reduces the probability of selecting an optimal marketing strategy by 1.1%.

Access to liquidity

- NA

Conclusions

- Reducing the costs of obtaining price information (additional price broadcasting, cellular use, training) could raise producers welfare.
- Improving transportation alternatives and road quality in the study area could increase quantity sold and facilitate sales in more lucrative markets.
- Policies aimed at increasing market surplus, such as technical assistance, could generate additional sales and provide better market opportunities to farmers, increasing their income.
- Credit programs, easing liquidity constraints, could help farmers adopt more profitable marketing strategies.

Acknowledgment:
We acknowledge funding support from Sustainable Agricultural and Natural Resource Management Collaborative Research Support Program (SANREM CRSP).

Reference: