Collective Action in Agriculture: The Case of Wine-grape Farmer Cooperatives in Chile

Pilar Jano
Universidad Adolfo Ibáñez
(coauthored with Brent Hueth, University of Wisconsin-Madison)

American Association of Wine Economists (AAWE)
10th Annual Conference, Bordeaux, France
June, 2016
Motivation

- Farmers in Chile are not organizing and reaping the potential benefits of collective action, such as access to high-value markets and increased competition.
- These could help them (especially small-holders) increase the price they receive for their produce.
- Organizing in farmer cooperatives is a way of integrating small-holder farmers (SFs) into high-value markets (Reardon and Barrett, 2000; Hellin et al., 2009; Torero et al., 2010).
Motivation and Objective

- While cooperatives have expanded in the world in the past decades (Reardon and Barrett, 2000), Chile is an exception in terms of the incidence of wine-grape farmer cooperatives. E.g. 5 active wine-grape cooperatives.

Research Question

- Why aren’t most SFs organized in wine-grape cooperatives in Chile, as they usually are in the rest of the world?
Potential Explanations

▶ The historical and institutional setting in Chile inhibited cooperative formation.
▶ Trust among farmers is insufficient to form cooperatives. E.g. free-rider problem.
▶ Cooperatives exist only where transaction costs are sufficiently high so that cooperatives help to fill market gaps.
▶ In this paper we focus on this last hypothesis.
Contributions

- Cooperative formation in economics: generally studied from an IO perspective including imperfect competition and cooperatives’ potential pro-competitive effect.
- Almost no work explicitly links collective action and cooperative formation (Sexton, 1987; Hueth and Moschini, 2014).
- In Chile, certain conditions that we investigate, have prevented widespread cooperative formation.
- Farmer associations provide a way to overcome liquidity constraints, information asymmetries, minimum efficient production scales, and/or marketing (Reardon and Barrett, 2000).
Theoretical Framework

Model Guidelines

- Cooperatives have elements of a public good and there are incentives to free ride, especially at the time of cooperative formation.
- For a cooperative to be formed, consumers (or future members) need to cover initial fixed costs. So, a minimum number of consumers is needed.
- Once the cooperative is created members cannot be excluded from the cooperative’s goods or services.
- So, there is an incentive for potential members to wait until other agents cover the initial fixed costs and then join the cooperative, delaying or impeding formation.
However, if there is sufficient demand for these goods or services—assumed to be privately known to consumers, cooperatives may be created to fill the missing-markets’ gap (based on Hueth and Moschini 2014).

In the case of wine-grape cooperatives, if there is no market available, or located sufficiently close, for farmers to sell their wine-grapes, farmers themselves may invest in forming a cooperative.
To study cooperative formation empirically, one would need data before and after formation, and formation is usually difficult to predict. Therefore, we do not study cooperative formation empirically *per se* but instead, we study the determinants of participation in farmer associations at one point in time (cross sectional data).
Empirical Strategy

- Analysis close in spirit to the analysis conducted by Holloway *et al* (2000) who explore the impact of household-level transaction costs on participation in governmentally-created milk groups.

- Their analysis is based on a regression of marketable surplus on transaction and other characteristics.

- They conclude that milk groups can enhance participation of farmers by providing better market access.

- We instead estimate the determinants that affect the probability of being member in a wine-grape cooperative on transaction cost measures (measures of isolation).
Empirical Strategy

Variables for Hypothesis Testing

- Measures of isolation: distance to main highway (+), number of alternative offers, and having more than one buyer in the season (-).
- Market infrastructure: valley of production (+ if less market infrastructure).
- Other controls: education of the farmer, wealth, and crop-management practices.

- We estimate a regression of the probability of being in a farmer cooperative using MLE.
Empirical Strategy

Data

- Random sample of 184 wine-grape farmers.
- Two wine valleys of Chile, Colchagua and Maule.
- During 5 months in the 2011-2012 season.
- We collected data mainly on farmer and farm characteristics, characteristics of the vineyard and crop-management practices, characteristics of the current and past contracts, investments made throughout the history of the crop, and participation in wine-grape farmer associations.
<table>
<thead>
<tr>
<th>Prob. of being part of a co-op</th>
<th>Co-op 1</th>
<th>Co-op 2</th>
<th>Co-op 3</th>
<th>Co-op 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Distance to the main highway (km)</td>
<td>0.003**</td>
<td>0.003**</td>
<td>0.003**</td>
<td>0.003**</td>
</tr>
<tr>
<td></td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
<td>(0.001)</td>
</tr>
<tr>
<td>More than one buyer last season</td>
<td>0.117*</td>
<td>0.116*</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.067)</td>
<td>(0.067)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of alternative offers</td>
<td>-0.004</td>
<td>-0.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.011)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Maule valley</td>
<td>0.185**</td>
<td>0.190***</td>
<td>0.206***</td>
<td>0.209***</td>
</tr>
<tr>
<td></td>
<td>(0.075)</td>
<td>(0.073)</td>
<td>(0.076)</td>
<td>(0.074)</td>
</tr>
<tr>
<td>Log of farm area (ha)</td>
<td>-0.009</td>
<td>-0.009</td>
<td>-0.005</td>
<td>-0.006</td>
</tr>
<tr>
<td></td>
<td>(0.024)</td>
<td>(0.022)</td>
<td>(0.023)</td>
<td>(0.021)</td>
</tr>
<tr>
<td>Household head education (years)</td>
<td>0.011*</td>
<td>0.011*</td>
<td>0.012**</td>
<td>0.013**</td>
</tr>
<tr>
<td></td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.006)</td>
<td>(0.006)</td>
</tr>
<tr>
<td>Defoliation in previous contract</td>
<td>-0.161**</td>
<td>-0.168**</td>
<td>-0.161**</td>
<td>-0.169**</td>
</tr>
<tr>
<td></td>
<td>(0.072)</td>
<td>(0.069)</td>
<td>(0.074)</td>
<td>(0.072)</td>
</tr>
<tr>
<td>Summer pruning</td>
<td>-0.050</td>
<td>-0.032</td>
<td>-0.056</td>
<td>-0.038</td>
</tr>
<tr>
<td></td>
<td>(0.064)</td>
<td>(0.065)</td>
<td>(0.064)</td>
<td>(0.065)</td>
</tr>
<tr>
<td>Had Botrytis last season</td>
<td>-0.080</td>
<td>-0.081</td>
<td>-0.065</td>
<td>-0.064</td>
</tr>
<tr>
<td></td>
<td>(0.093)</td>
<td>(0.095)</td>
<td>(0.088)</td>
<td>(0.088)</td>
</tr>
<tr>
<td>Irrigation</td>
<td>0.073</td>
<td>0.068</td>
<td>0.098</td>
<td>0.092</td>
</tr>
<tr>
<td></td>
<td>(0.070)</td>
<td>(0.069)</td>
<td>(0.069)</td>
<td>(0.067)</td>
</tr>
<tr>
<td>Observations</td>
<td>174</td>
<td>177</td>
<td>174</td>
<td>177</td>
</tr>
</tbody>
</table>

Notes: *p<0.10 ** p<0.05 *** p<0.01. Estimated using a logit model with robust standard errors. Average marginal effects reported. Standard errors are in parenthesis. Regressions include a constant term.
We find evidence in favor of the transaction cost hypothesis: more isolation and less market infrastructure increases the probability of participating in a wine-grape farmer cooperative.

This study highlights the need for institutional changes designed to promote farmer associations which can improve market access and pricing for the disadvantaged farmers.
Thank you!

Pilar Jano, Ph.D.
Business School, Universidad Adolfo Ibáñez
Viña del Mar, Chile
pilar.jano@uai.cl