Careers in Farming: Evidence from the Chilean Wine-grape Market

by

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In career concern models, the market learns about the worker’s ability over time and competes for high-ability workers. This competition generates incentives for workers to exert effort [1, 2, 3]. We develop a model based on Gibbons and Murphy [3] where the existence of implicit incentives can be inferred by measuring differences in the characteristics of farmers, and in the structure of the contracts farmers face, as they progress through their “careers.” In addition, we incorporate investment in training by the winery on the farmer in LTs.

This model results in conditions under which LTs are preferred and in predictions regarding:
- explicit incentives to exert effort,
- past performance,
- farmers’ abilities, and
- market competition by wineries.

We expect these to be higher for farmers in LTs.

**Research Questions**

Are there “career” incentives in arm’s-length contracts between wine-grape farmers and wineries in Chile?

Specific questions:
- Are contracts structured like a ladder?
- Who can access long-term contracts?

**Empirical Background**

The Contract Ladder

- NC: No contract
- OP: one-period contract
- ROP: repeated one-period contract
- LT: long-term contract

In Chile, wine grapes are mostly sold through contracts signed between wine-grape farmers and wineries. Contracts vary depending on length, price, product quality requirements, and technical assistance provided by buyers with LTs demanding more of each.

**Model**

Measure of grape quality do not fully capture farmers’ performance. In any contract relationship where measured performance does not fully capture desired performance, buyers cannot rely solely on pay-for-performance contingencies to motivate on-going work diligence and human-capital investment.

We investigate production contracts between independent wine-grape farmers and wineries in Chile. We observe explicit incentives in pay-for-performance provisions that depend on measurable characteristics of grape quality, and we test for the presence of complementary implicit incentives that arise from competition in the market for contract farmers. In addition, we use the term of long-term contracts as an ante protection against potential future hold-up, we hypothesize that long-term contracts represent the final stage in the farmers’ careers after a series of short-term contracts.

**Data and Empirics**

- Random sample of 184 wine-grape farmers.
- Two wine valleys of Chile, Colchagua and Maule. Representative of Chilean wine production including heterogeneous types of contracts.
- During 5 months in the 2011-2012 season.
- Collected data on:
  - Characteristics of farmer, farm, vineyard, current and previous contracts, training, and investments.
  - Empirical model using a logistic distribution, $Pr(\text{LT} = 1|x) = \frac{e^{\beta x}}{1 + e^{\beta x}}$
  where $Pr(\text{LT} = 1)$ is the probability of accessing an LT, $x$ is a vector of regressors, and $\beta$ is a vector of parameters.
  - Regressors: crop-management practices, farmer characteristics reflecting ability, quality-improving past investments, wealth proxy and credit variables, indicator of market competition, interaction between training and contracting with same winery, other controls.

**Results**

Table 1: Determinants of the probability of having a long-term contract in the current season

<table>
<thead>
<tr>
<th>LT</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cultivation ability</td>
<td>0.012</td>
<td>0.008</td>
<td>0.005</td>
<td>0.004</td>
</tr>
<tr>
<td>Log of experience in years</td>
<td>0.063**</td>
<td>0.082**</td>
<td>0.066**</td>
<td>0.072**</td>
</tr>
<tr>
<td>Contracting early in the season</td>
<td>0.048</td>
<td>0.038</td>
<td>0.034</td>
<td>0.031</td>
</tr>
<tr>
<td>Thinning in previous contract</td>
<td>0.254***</td>
<td>0.261***</td>
<td>0.313***</td>
<td>0.314***</td>
</tr>
<tr>
<td>Summer pruning</td>
<td>0.021</td>
<td>0.014</td>
<td>0.014</td>
<td>0.017</td>
</tr>
<tr>
<td>Had Betytage last season</td>
<td>0.108</td>
<td>0.123***</td>
<td>0.160***</td>
<td>0.175***</td>
</tr>
<tr>
<td>Training from buyer in previous contract</td>
<td>0.014</td>
<td>0.010</td>
<td>0.011</td>
<td>0.012</td>
</tr>
<tr>
<td>Ag. studies person in charge of the wine grape</td>
<td>0.204***</td>
<td>0.209***</td>
<td>0.241***</td>
<td>0.265***</td>
</tr>
<tr>
<td>Soil quality</td>
<td>0.123***</td>
<td>0.152***</td>
<td>0.161***</td>
<td>0.169***</td>
</tr>
<tr>
<td>Tractor ownership</td>
<td>0.016</td>
<td>0.001</td>
<td>0.000</td>
<td>0.000</td>
</tr>
<tr>
<td>Credit constrained</td>
<td>0.013</td>
<td>0.006</td>
<td>0.003</td>
<td>0.002</td>
</tr>
<tr>
<td>Presence of credit contract with winery</td>
<td>0.134***</td>
<td>0.118***</td>
<td>0.111***</td>
<td>0.109***</td>
</tr>
<tr>
<td>Training in previous contract with same wine contract</td>
<td>0.154***</td>
<td>0.153***</td>
<td>0.145***</td>
<td>0.143***</td>
</tr>
<tr>
<td>Length tenure (months)</td>
<td>0.070</td>
<td>0.078</td>
<td>0.082</td>
<td>0.085</td>
</tr>
</tbody>
</table>

**Conclusions**

- Contracts in the Chilean wine-grape market are structured as a ladder with long-term contracts located at the top.
- Find evidence for implicit market based incentives (“careers”) in farming. LTs are more likely with:
  - High past performance (past investments in high-quality production).
  - High ability (experience and past investments in human capital), and
  - Market competition (contracting early in the season).

**References**