Farmer preferences for joint venture farm business structures: a choice experiment

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Farmer preferences for joint venture farm business structures: a choice experiment

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Background

• Adoption of technology is critical to driving productivity improvement in the broadacre grains sector

• An increasing productivity gap between leading farms and average farms

• Strong positive relationship between farm size and profitability

• Not just returns to scale but more advanced production technology/management

ABARES
Opportunities for new farm business structures to address constraints on small-medium size family farms

Research Questions

• Are broadacre producers interested in pursuing opportunities to develop joint venture farm business structures?

• What joint venture business structure characteristics are most attractive to broadacre grain producers?

• Are there unique socio-demographic and attitudinal variables associated with interest in different joint venture structures?
What could a joint venture look like?

- **Formal Joint Venture Structure**
  - **Family farm 1**: 2,000 hectares
  - **Family farm 2**: 2,000 hectares
  - **Farm 3**

- **Farm Machinery**
An example
Research Methodology

• Scoping survey of grain grower interest and motivation in joint ventures (n=573, 2012).

• Discrete choice experiment – farmer preferences for different JV business structures and characteristics (n=340, 2013).

• Phone initiated, then online choice experiment with broadacre grain producers across the southern and western grain growing regions.

• Post-hoc analysis of latent classes via probit models comprising socio-demographic variables.
Farmer Interest in JV

Would you ever consider forming a formal JV structure (n=573)

- Yes: 21%
- Maybe: 14%
- No: 62%
- Already in one: 3%

Legend:
- Yes
- Maybe
- No
- Already in one
Reason for considering a joint venture:

- Reducing costs - 55%
  - Machinery costs - 28%
- Economies of scale / improved efficiency – 17%
- Improved utilisation of capital / greater profitability 15%
- Improve labour availability and efficiency – 10%
## Choice attributes and levels

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Attribute levels</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of farm businesses in the JV structure</td>
<td>• 2, 3 or 4 farm businesses</td>
</tr>
<tr>
<td>Influence on operational decisions</td>
<td>• Sole decision-maker</td>
</tr>
<tr>
<td></td>
<td>• Final decision-maker, in consultation with other partners</td>
</tr>
<tr>
<td></td>
<td>• Shared decision-making with other partners</td>
</tr>
<tr>
<td></td>
<td>• Not the final decision-maker, but input into decisions</td>
</tr>
<tr>
<td></td>
<td>• No operational decisions</td>
</tr>
<tr>
<td>Farming with the latest machinery</td>
<td>• New machinery</td>
</tr>
<tr>
<td></td>
<td>• Older machinery (initially 5 yrs plus)</td>
</tr>
<tr>
<td>Leave arrangements</td>
<td>• Extra 2 weeks leave</td>
</tr>
<tr>
<td></td>
<td>• No change</td>
</tr>
<tr>
<td>Change in annual net farm income</td>
<td>• -15k, no change, 15k, 30k, 50k or 75k</td>
</tr>
</tbody>
</table>
**Example Best-Only Choice Set**

*Figure 1. Example choice set in the farmer JV choice experiment questionnaire*

Carefully consider each of the following options for formal JV structures. If options A, B, C and D were the only ones available, which option would be most attractive to you?

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Option A</th>
<th>Option B</th>
<th>Option C</th>
<th>Option D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of farm businesses in the JV structure</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Your influence on operational decisions (non-board decisions)</td>
<td>Sole decision-maker</td>
<td>Shared decision-making with other partners</td>
<td>Not the final decision-maker, but input into decisions</td>
<td>No operational decisions</td>
</tr>
<tr>
<td>Farming with the latest machinery</td>
<td>Older machinery (initially 5 yrs plus)</td>
<td>New machinery</td>
<td>New machinery</td>
<td>New machinery</td>
</tr>
<tr>
<td>Leave arrangements</td>
<td>Extra 2 weeks of flexible leave</td>
<td>No change</td>
<td>No change</td>
<td>Extra 2 weeks of flexible leave</td>
</tr>
<tr>
<td>Change in annual net farm income (compared to current 5yr average)</td>
<td>+ $30k</td>
<td>No Change</td>
<td>+ $50k</td>
<td>+ $15k</td>
</tr>
</tbody>
</table>

**Most attractive option**

- [ ]
- [ ]
- [ ]
- [ ]
## Latent class model results

### Table 4. Latent class model result

<table>
<thead>
<tr>
<th>Choice Attributes</th>
<th>Class A Parameter</th>
<th>S.E.</th>
<th>Class B Parameter</th>
<th>S.E.</th>
<th>Class C Parameter</th>
<th>S.E.</th>
<th>Class D Parameter</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Income</td>
<td>0.044***</td>
<td>0.004</td>
<td>0.039***</td>
<td>0.006</td>
<td>-0.002</td>
<td>0.003</td>
<td>0.313***</td>
<td>0.004</td>
</tr>
<tr>
<td>Partners</td>
<td>-0.509***</td>
<td>0.100</td>
<td>1.426***</td>
<td>0.389</td>
<td>0.362***</td>
<td>0.129</td>
<td>-0.237*</td>
<td>0.130</td>
</tr>
<tr>
<td>Decisions</td>
<td>0.037</td>
<td>0.041</td>
<td>0.497***</td>
<td>0.113</td>
<td>-0.032</td>
<td>0.051</td>
<td>0.647***</td>
<td>0.085</td>
</tr>
<tr>
<td>Machinery</td>
<td>0.780***</td>
<td>0.209</td>
<td>-0.877***</td>
<td>0.313</td>
<td>0.512***</td>
<td>0.185</td>
<td>0.241</td>
<td>0.232</td>
</tr>
<tr>
<td>Leave</td>
<td>-0.348*</td>
<td>0.184</td>
<td>-1.820***</td>
<td>0.512</td>
<td>-1.475***</td>
<td>0.193</td>
<td>0.095</td>
<td>0.338</td>
</tr>
</tbody>
</table>

**Log-likelihood**: -1708.98

**Adjusted R2**: 0.27

**AIC/n**: 2.04

**BIC/n**: 2.10

Notes: ***, **, * denote significance at the 1%, 5% and 10% levels, respectively. n=340.

D- WTA $20k less income for each step loss in control (Decisions)
Post-hoc analysis of socio-demographic & attitudinal variables

Table 7. Probit model results based on market segment membership

<table>
<thead>
<tr>
<th>Socio-demographic variables</th>
<th>Class A</th>
<th></th>
<th></th>
<th>Class B</th>
<th></th>
<th></th>
<th>Class C</th>
<th></th>
<th></th>
<th>Class D</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>Std. Err.</td>
<td>P&gt;</td>
<td>z</td>
<td>Coefficient</td>
<td>Std. Err.</td>
<td>P&gt;</td>
<td>z</td>
<td>Coefficient</td>
<td>Std. Err.</td>
<td>P&gt;</td>
<td>z</td>
</tr>
<tr>
<td>JV interest</td>
<td>0.017</td>
<td>0.120</td>
<td>0.885</td>
<td>0.149</td>
<td>0.134</td>
<td>0.267</td>
<td>0.025</td>
<td>0.127</td>
<td>0.845</td>
<td>-0.227</td>
<td>0.138</td>
<td>0.099*</td>
</tr>
<tr>
<td>Flexible work</td>
<td>0.166</td>
<td>0.102</td>
<td>0.103</td>
<td>-0.058</td>
<td>0.113</td>
<td>0.611</td>
<td>0.267</td>
<td>0.113</td>
<td>0.018**</td>
<td>-0.377</td>
<td>0.106</td>
<td>0.006***</td>
</tr>
<tr>
<td>University degree</td>
<td>0.333</td>
<td>0.215</td>
<td>0.121</td>
<td>-0.434</td>
<td>0.275</td>
<td>0.114</td>
<td>-0.724</td>
<td>0.290</td>
<td>0.013**</td>
<td>0.596</td>
<td>0.242</td>
<td>0.014**</td>
</tr>
<tr>
<td>More professional</td>
<td>0.030</td>
<td>0.094</td>
<td>0.746</td>
<td>0.189</td>
<td>0.108</td>
<td>0.080*</td>
<td>-0.081</td>
<td>0.102</td>
<td>0.427</td>
<td>-0.115</td>
<td>0.105</td>
<td>0.274</td>
</tr>
<tr>
<td>Rely on experts</td>
<td>-0.089</td>
<td>0.089</td>
<td>0.322</td>
<td>0.264</td>
<td>0.109</td>
<td>0.016**</td>
<td>-0.034</td>
<td>0.099</td>
<td>0.735</td>
<td>-0.087</td>
<td>0.100</td>
<td>0.385</td>
</tr>
<tr>
<td>Family history</td>
<td>-0.212</td>
<td>0.096</td>
<td>0.027**</td>
<td>-0.136</td>
<td>0.108</td>
<td>0.210</td>
<td>0.180</td>
<td>0.101</td>
<td>0.077*</td>
<td>0.233</td>
<td>0.105</td>
<td>0.026**</td>
</tr>
<tr>
<td>JV risky</td>
<td>-0.079</td>
<td>0.108</td>
<td>0.464</td>
<td>-0.034</td>
<td>0.122</td>
<td>0.782</td>
<td>-0.153</td>
<td>0.118</td>
<td>0.194</td>
<td>0.313</td>
<td>0.126</td>
<td>0.013**</td>
</tr>
<tr>
<td>Constant</td>
<td>-0.548</td>
<td>0.125</td>
<td>0.000</td>
<td>-1.106</td>
<td>0.150</td>
<td>0.000</td>
<td>-0.699</td>
<td>0.135</td>
<td>0.000</td>
<td>-0.581</td>
<td>0.138</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Log likelihood               | -211.0 |        |      | -150.7 |        |      | -174.5 |        |      | -162.5 |        |      |
Prop > Chi2                   | 0.028** |        |      | 0.030** |        |      | 0.007*** |        |      | 0.000*** |        |      |
Pseudo R2                     | 0.036  |        |      | 0.049  |        |      | 0.053  |        |      | 0.145  |        |      |

Notes: ***, **, * denote significance at the 1%, 5% and 10% levels, respectively.
Latent class summary

• Class A (34%) – Control neutral farmers
  ▲ income, ▼ partners, (n.s.) control, ▲ machinery & ▼ leave
  ▼ Family history

• Class B (18%) – Managerial farmers
  ▲ income, ▲ partners, ▲ control, ▼ machinery & ▼ leave
  ▲ More professional and ▲ rely on experts

• Class C (23%) – Income & control neutral farmers
  (n.s) income, ▲ partners, (n.s) control, ▲ machinery & ▼ leave
  ▲ Flexible work, ▼ university degree & ▲ family history

• Class D (25%) – Business as usual farmers
  ▲ income, ▼ partners, ▲ control,
  ▼ JV interest, ▼ flexible work, ▲ university degree, ▲ family history & ▲ JV risky
Conclusions

• There is significant level of (niche) farmer interest in JV structures – focused on cost reduction

• Limited ability to predict JV interest using the socio-demographic /attitudinal variables

• Grain growers have diverse preferences for JV characteristics – but overall, loss of control is the key concern

• Substantial farmer segments are more open to collaboration and ‘sharing control’

• Structures that can accommodate members with different preferences for control are worth exploring
Thank you
Take Home Messages

• There is a small, but significant niche farmer interest in the adoption of JV structures, despite the current low levels of adoption.

• Exploring unobserved heterogeneity of farmer JV preferences indicates that farmers are interested in a diverse range of JV structure characteristics

• Limited ability to predict market segment membership using socio-demographic /attitudinal variables

• Important farmer segments were identified that are more open to collaboration and considering a range of JV decision models

• Structures that can accommodate members with different preferences for control need exploring