The Relationship Between the ACRE Program and Crop Insurance

Nick Paulson
Gary Schnitkey
Carl Zulauf

SCC-76
March 19-21, 2009
Galveston, TX
ACRE Program

• Beginning in 2009, producers have choice between:
  – (1) Traditional option
    • Direct payments
    • Marketing loans
    • Countercyclical payments
  – (2) ACRE option
    • Direct payments with 20% cut
    • Marketing loans with 30% cut in loan rates
    • ACRE revenue plan
ACRE Program

- ACRE based on a state-level revenue index
- Payments are crop specific
- Payments based on planted acres
- Revenue guarantee cannot change by more than 10% from previous year
ACRE Program: Two Triggers

1. Actual state revenue must fall below state guarantee level
2. Actual farm revenue must fall below farm guarantee level (farm benchmark)

• Implications
  – ACRE could pay at state level and some farms would not be eligible
  – Farm-level losses may not trigger ACRE payment
# State Revenue Trigger

<table>
<thead>
<tr>
<th>State Guarantee</th>
<th>State Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>.90</td>
<td>State Yield (Planted Acre Basis)</td>
</tr>
<tr>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>5-year Olympic Avg. State Yield (Planted Acre)</td>
<td>Capped at +/- 10% from previous year</td>
</tr>
<tr>
<td>X</td>
<td>U.S. Market Avg. Price</td>
</tr>
<tr>
<td>2-year U.S. Market average Price</td>
<td></td>
</tr>
</tbody>
</table>

Must Exceed
### Farm Revenue Trigger

<table>
<thead>
<tr>
<th>Farm Guarantee</th>
<th>Farm Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>5-year Olympic Avg Farm Yield</td>
<td>Farm Yield</td>
</tr>
<tr>
<td>( \times )</td>
<td>( \times )</td>
</tr>
<tr>
<td>2-year U.S. Market Average Price</td>
<td>U.S. Market Average Price</td>
</tr>
<tr>
<td>( + )</td>
<td></td>
</tr>
<tr>
<td>Crop Insurance Premium</td>
<td></td>
</tr>
</tbody>
</table>

- Must Exceed

Implies that farm-level yields will have to be provided.

Rules and documentation requirements for proving yield histories have not yet been released.
ACRE Payment

If both triggers are met, then the payment will be:

Planted acres
X State-level payment (state guarantee minus state revenue)
X .833 (.85 in 2012)
X Avg Historic Farm Yield / Avg Historic State Yield

Maximum state level payment is 25% of state guarantee
ACRE vs. Traditional

- **Traditional:**
  - $4 to $5 higher per acre direct payment
  - Very small chance of LDP or counter-cyclical payments

- **ACRE:**
  - $4 to $5 lower direct payment
  - Much higher chance of ACRE payments. In some years, payments could be large

- **Tradeoff:**
  - Give up certain dollars (Direct) for uncertain dollars (ACRE)
ACRE and Crop Insurance

- ACRE covers systemic revenue risk

- Individual insurance plans cover risk at the farm level
  - APH yield
  - CRC
  - Both value losses using futures prices
  - Cover price movements from fall/ spring to harvest
ACRE and Crop Insurance

• ACRE not a complete substitute for crop insurance
  – Historical revenue index vs. “expected” yield/revenue in a given crop year
  – U.S. season average price vs. futures

• Coverage will overlap
  – Affect policy type or coverage level choices?
Historical Evaluation
state Trigger

• Corn
  - State trigger met in 10 out of 31 years (32%)
  - Avg. payment over all years = $17 per planted acre
  - Avg. payment when ACRE occurs = $53 per planted acre

• Soybeans
  - State trigger is met in 5 out of 31 years (16%)
  - Avg. payment over all years = $6 per planted acre
  - Avg. payment when ACRE occurs = $37 per planted acre
Historical Evaluation

Farm Triggers

• Corn
  – Between 78% and 86% of farms meet farm trigger with no farmer-paid premium
  – Between 87% and 91% of farms meet farm trigger with $20 farmer-paid premium

• Soybeans
  – Between 81% and 93% of farms meet farm trigger with no farmer-paid premium
  – Between 90% and 98% of farms meet farm trigger with $20 farmer-paid premium
## Historical Evaluation - Corn

Percent of IL FBFM farms receiving payments

<table>
<thead>
<tr>
<th>Year</th>
<th>ACRE</th>
<th>85% CRC</th>
<th>85% APH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1977</td>
<td>90%</td>
<td>73%</td>
<td>25%</td>
</tr>
<tr>
<td>1983</td>
<td>83%</td>
<td>83%</td>
<td>83%</td>
</tr>
<tr>
<td>1984</td>
<td>83%</td>
<td>18%</td>
<td>15%</td>
</tr>
<tr>
<td>1986</td>
<td>100%</td>
<td>24%</td>
<td>2%</td>
</tr>
<tr>
<td>1988</td>
<td>72%</td>
<td>81%</td>
<td>81%</td>
</tr>
<tr>
<td>1991</td>
<td>77%</td>
<td>42%</td>
<td>38%</td>
</tr>
<tr>
<td>1997</td>
<td>99%</td>
<td>23%</td>
<td>23%</td>
</tr>
<tr>
<td>1998</td>
<td>98%</td>
<td>62%</td>
<td>5%</td>
</tr>
<tr>
<td>1999</td>
<td>96%</td>
<td>38%</td>
<td>7%</td>
</tr>
<tr>
<td>2005</td>
<td>97%</td>
<td>67%</td>
<td>34%</td>
</tr>
</tbody>
</table>
## Historical Evaluation - Corn

Percent of IL FBFM farms receiving payment

<table>
<thead>
<tr>
<th>Year</th>
<th>ACRE</th>
<th>85% CRC</th>
<th>85% APH</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980</td>
<td>0%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>1981</td>
<td>0%</td>
<td>30%</td>
<td>3%</td>
</tr>
<tr>
<td>1982</td>
<td>0%</td>
<td>48%</td>
<td>2%</td>
</tr>
<tr>
<td>1995</td>
<td>0%</td>
<td>49%</td>
<td>49%</td>
</tr>
<tr>
<td>2002</td>
<td>0%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>2004</td>
<td>0%</td>
<td>57%</td>
<td>1%</td>
</tr>
</tbody>
</table>
Monte Carlo Model

- IL state-level yields (Weibull, ML parameters)
- US MYA prices (Lognormal)
- Insurance/ Futures prices (Lognormal)
- Farm-level yields (Weibull, iFarm 09)
  - Low/ high risk
  - Low/ high correlation with state yield
- Historical correlation structure imposed (Iman and Conover)
- Various insurance coverage levels
Results Summary - Corn

• 2009 ACRE price component ~ $4

• Scenario 1: 2009 crop year
  – $4/4.04 insurance price
  – $3.74 expected US MYA price (FAPRI 2009)

• Scenario 2
  – $4/4.04 insurance price
  – $4 expected US MYA price

• Scenario 3
  – $4.50 insurance price
  – $4 expected US MYA price
Results Summary - Corn

- Can assume producer markets at HP (less basis) or at MYA price
  - If HP is used, revenue insurance dominates yield insurance
  - If MYA is used, revenue insurance still dominates without ACRE
  - With ACRE and using MYA price, yield insurance performs slightly better in most cases
Results Summary

<table>
<thead>
<tr>
<th>85% (70%) Coverage</th>
<th>Scenario 1</th>
<th>Scenario 3</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>5% cVaR</td>
<td>Min Revenue</td>
</tr>
<tr>
<td>Low Risk High Corr</td>
<td>APH</td>
<td>APH</td>
</tr>
<tr>
<td>Low Risk Low Corr</td>
<td>APH (CRC)</td>
<td>APH</td>
</tr>
<tr>
<td>High Risk High Corr</td>
<td>APH</td>
<td>APH</td>
</tr>
<tr>
<td>High Risk Low Corr</td>
<td>APH (CRC)</td>
<td>APH (CRC)</td>
</tr>
</tbody>
</table>
Conclusions

- Coupling ACRE with yield insurance may offer better risk reduction at a lower cost than with CRC

- Considerations:
  - Farm-state yield correlation
  - Assumptions on timing of marketing

- Magnitude of effect proportional to:
  - Farm yield risk
  - Coverage level
Conclusions

• Robust across corn/soybean/wheat and correlation/farm risk/price scenarios

• Other:
  - If ACRE is elected, may be able to reduce coverage level within insurance plans to achieve similar levels of risk reduction
    • i.e. 85% CRC + Traditional $\rightarrow$ 70% CRC + ACRE
  • Premium savings will, in general, offset reduction in direct payments
  • Depends on level of correlation between farm and state yields