Cotton Abandonment

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Abandonment

Abandonment is believed to be caused by a variety of factors:

- Weather and related variables, obviously
- Crop insurance benefits
- Farm bill attributes
- Cost of production
Texas Abandonment

Source: USDA, NASS
El Niño/La Niña-ENSO Values

Average ENSO values (SEP-AUG); Source: NOAA
ENSO Values and Planted Cotton Acres

Average Annual ENSO Value vs Texas Abandonment Rate; Source: USDA-NASS, NOAA
Other Factors

Pre-season (Sep-May) Moisture, High Plains Average; Source: NOAA
Other Factors

Growing Degree Days (May-Sep), Lubbock, TX; Source: NWS
Other Factors

Proportion of Texas Cotton Acres Insured at 65% or higher (all types); Source: RMA
Other Factors

Cost of Production Share at Planting

Share of Total Cost of Production at or before Planting, Prairie Gateway; USDA-ERS
## Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>t-value</th>
<th>p-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>12.609</td>
<td>6.103</td>
<td>2.066</td>
<td>0.047</td>
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<tr>
<td>ENSO</td>
<td>-0.053</td>
<td>0.027</td>
<td>-1.937</td>
<td>0.061</td>
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<tr>
<td>GDD</td>
<td>-0.006</td>
<td>0.003</td>
<td>-2.187</td>
<td>0.036</td>
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<tr>
<td>GDD(^2)</td>
<td>0.000</td>
<td>0.000</td>
<td>2.316</td>
<td>0.027</td>
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<tr>
<td>Insurance</td>
<td>0.339</td>
<td>0.187</td>
<td>1.815</td>
<td>0.079</td>
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<tr>
<td>Pre-Season</td>
<td>0.037</td>
<td>0.375</td>
<td>1.001</td>
<td>0.324</td>
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<tr>
<td>Moisture</td>
<td></td>
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<tr>
<td>Farm Bill</td>
<td>0.779</td>
<td>0.955</td>
<td>0.812</td>
<td>0.422</td>
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<tr>
<td>Harvest Price</td>
<td>-0.169</td>
<td>0.163</td>
<td>-1.042</td>
<td>0.304</td>
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<tr>
<td>ln*Pre</td>
<td>-0.075</td>
<td>0.052</td>
<td>-1.433</td>
<td>0.161</td>
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<tr>
<td>ln*FB</td>
<td>-0.824</td>
<td>1.038</td>
<td>-0.794</td>
<td>0.432</td>
</tr>
</tbody>
</table>

F-value = 8.051, Adjusted $R^2 = 0.602$
The Role of Moisture on Insurance

Predicted Abandonment vs. Total Insurance Effect (w w/o Pre-season Rainfall)
Discussion

- There is a significant upward trend in abandonment in Texas over time.
  - Mean of 10% in 1980 to a mean of 34% in 2022
- Higher proportion of acres in TX means a higher US average abandonment, on average
- Slight downward trend in ENSO values (move towards more La Niña average ENSO)
  - Lower ENSO values are associated with higher abandonment
- Crop insurance matters…but maybe not as much as everyone thinks
  - With no pre-season moisture considered, impact of crop insurance is large
  - Considering average pre-season moisture, the impact of crop insurance is muted
Conclusions

- At the margin, crop insurance influences abandonment decisions
  - BUT, that relationship is complex
    - Insurance price
    - Pre-season and in-season moisture
    - Cost of production

- ENSO values are important
  - Reflect dominant weather patterns; suite of weather variables that will be impacted

- Predicting abandonment is difficult
  - Variance is greater in the La Niña phase than El Niño phase

- Harvested acres determine production in cotton, not planted. Understanding abandonment is critical to projections of cotton