An Economic Perspective on Farmland Value Trends

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Rising Farmland Values: Causes and Concerns
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Agenda

• The current situation
• What drives farmland values?
• How high will they go?
• How long will this last?
Current U.S. Land Market

Characterized by:

• Rapidly rising values
• Generally thin market
• Headline sales that may or may not be representative
• Very strong farmer demand (70%+ of sales)
• Investor interest
• General sense of optimism
How High?

• Prices likely headed higher, but......
  – Yes prices will go down *someday* but *probably* not anytime soon
  – Prices will likely go down substantially at some time in the future – commodity markets are volatile
  – Let’s take a short-stroll through history
All U.S. Agricultural Real Estate Values, 1913-2011, (2005 USD per Acre)
What Drives Value?

• General idea of purchasing capital assets
  – Obtain the rights to future earnings for a price less than the real earnings that it will produce

• Capital asset values are determined by **EXPECTATIONS** of the level of future earnings and their present value
  – Earnings are difficult to forecast
  – Interest rates and inflation drive present values and are equally difficult to forecast

• It is very difficult to understand when expectations are misinformed
  – Compounded by the fact that farmland is an infinite life asset with relatively low rates of turnover
A Simple Model of Farmland Values

The income capitalization model:

\[ \text{Farmland Value} = \frac{\text{Income}}{\text{discount rate} \text{ (\%)} - \text{growth rate} \text{ (\%)}} \]

Important points:

\[ \uparrow \text{Income} \quad \rightarrow \quad \text{land value} \quad \uparrow \]
\[ \uparrow \text{Discount rate} \quad \rightarrow \quad \text{land value} \quad \downarrow \]
\[ \uparrow \text{Income growth rate} \quad \rightarrow \quad \text{land value} \quad \uparrow \]

6\% discount rate less 1\% growth = 5\% “cap rate”

Cash rent multiple is the inverse of the cap rate
By this measure farmland looks pricey today

Reflect expected earnings growth and low interest rates

Value-to-Cash Rent Multiple for IA, IL, IN Cropland, 1967-2011

Sources: IL and IA compiled from NASS Reports, IN from Purdue Land Value
Interest Rate on 10-Year Treasury Bonds, 1970-2011

<table>
<thead>
<tr>
<th>Period</th>
<th>Average Interest Rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970 to 1979</td>
<td>7.5</td>
</tr>
<tr>
<td>1980 to 1989</td>
<td>10.6</td>
</tr>
<tr>
<td>1990 to 1999</td>
<td>6.7</td>
</tr>
<tr>
<td>2000 to 2009</td>
<td>4.5</td>
</tr>
<tr>
<td>Entire period 1970 to 2009</td>
<td>7.3</td>
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</tbody>
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Cash rent multiple begins to climb
Cash Rent per Bushel of Corn Yield, High Quality IN Farmland, 1976-2011
Land Values Under Alternative Capitalization Rates (Multiples) and Income Levels

- 3% (33)
- 4% (25)
- 5% (20)
- 6% (17)
- 8% (13)

**2011 Value HQ IN Farmland $6,521**

**Current Cash Rental Rate HQ IN Farmland, $230 per Acre**
Cap Rate Risk

- Monetary policy change = cap rate ↑
- Economic recovery = cap rate ↑
- Inflation = cap rate ↑
- Increased volatility/risk = cap rate ↑
- Slowing income growth in ag = cap rate ↑
Growth Needed in Future for 200 BP Interest Rate Increase and 10% Income Level Reduction *

\[ \text{Implied Growth Rate} = -\frac{1}{\text{multiple}} + r + \text{risk premium} \]

*Interest Rates based on average annual rate on 10 Year U.S. Treasury Bond

A Shock increases only interest rate and reduces income by 10%
holding price constant at 2010 level

Interest rate increase and income reduction applied
Land rent has averaged 35% of revenue over this period, high = 45%, low = 22%
So What About Corn Prices?

- Darrel Good and Scott Irwin forecast the new plateau prices as follows:

<table>
<thead>
<tr>
<th></th>
<th>Corn</th>
<th>Soybeans</th>
<th>Wheat</th>
</tr>
</thead>
<tbody>
<tr>
<td>Post Dec 2006</td>
<td>------</td>
<td>-----------</td>
<td>--------</td>
</tr>
<tr>
<td>Monthly Price</td>
<td>$4.60</td>
<td>$11.50</td>
<td>$5.80</td>
</tr>
<tr>
<td>Average</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High</td>
<td>$6.70</td>
<td>$19.10</td>
<td>$10.15</td>
</tr>
<tr>
<td>Low</td>
<td>$3.00</td>
<td>$8.20</td>
<td>$3.30</td>
</tr>
</tbody>
</table>

Land Values Under Alternative Capitalization Rates (Multiples) and Rent per Bushel of Corn, HQ IN Farmland

- 3% (33)
- 4% (25)
- 5% (20)
- 6% (17)
- 8% (13)

Box captures I&G’s corn price range with land receiving 35% of gross revenue @ 188 bu/ac
Fundamentals Today Make Prices Look Attractive

– Today’s fundamentals – earnings and interest rates make prices look attractive
  • Today’s fundamentals were not necessarily yesterday’s
  • Tomorrow’s fundamentals are not necessarily today’s
Two Key Takeaways

• Policy plays a key role in current situation
  – Biofuels
  – Crop insurance
  – Environmental policy

• Macro-economics plays a key role in the situation
  – Interest rates
  – Exchange rates
  – Demand (income growth)
Thoughts on Bubbles

.... you get a bubble when a very high percentage of the population buys into some originally sound premise.... that (the premise) becomes distorted as time passes and people forget the original sound premise and start focusing solely on the price action....

Excerpt from Warren Buffett’s interview with the Financial Crisis Inquiry Commission
So What are Some of the Elements of the Premise and are They Sound?

A. Population and economic growth in emerging economies puts great leverage on food demand

B. Biofuels create large, new sustained demand

C. Ability to expand supply is limited – land and productivity

D. Ag will work when inflation comes
A. Economic growth in populous emerging economies puts leverage on food demand
Big Demand Increases From Ethanol are Likely Over

B. World appetite for bio-fuels creates new, large demand?

2005 to 2010 Crops Average 689 million bushels ADDITIONAL/year

2011 to 2015 Crops Average 215 million bushels ADDITIONAL/year

C. Ability to expand supply is limited?

Price Risk is Substantial

Weekly Nearby Corn Futures Contract Prices, 2006-2011
Final Thoughts

• There is plenty of room for land prices to go higher

• There are substantial risks associated with higher moves
  – Interest rates (cap rates)
  – These prices and rates will encourage use of leverage
  – Demand growth will face challenges
  – Supply response is coming
  – Will we really end up at $4.60 on corn?