Managing Margin Risk
Session 5: February 24

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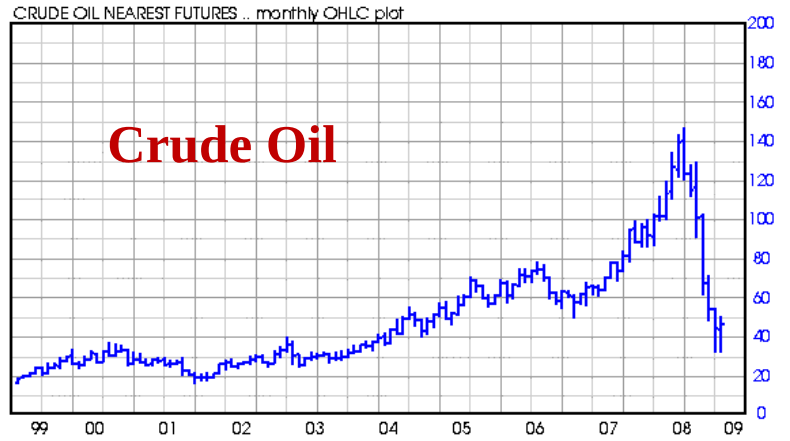
North Central Risk Management Education Center

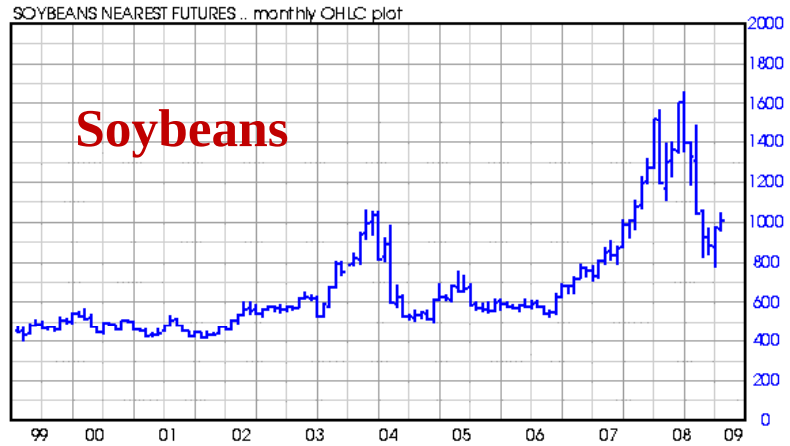
Putting it all together into a plan to manage margin risk

Outline

- 10-Step Margin Risk Management Plan
- Review of concepts
  - Updated ID-166 and breakeven price example
- What about farm financial position?

What is Margin Risk?





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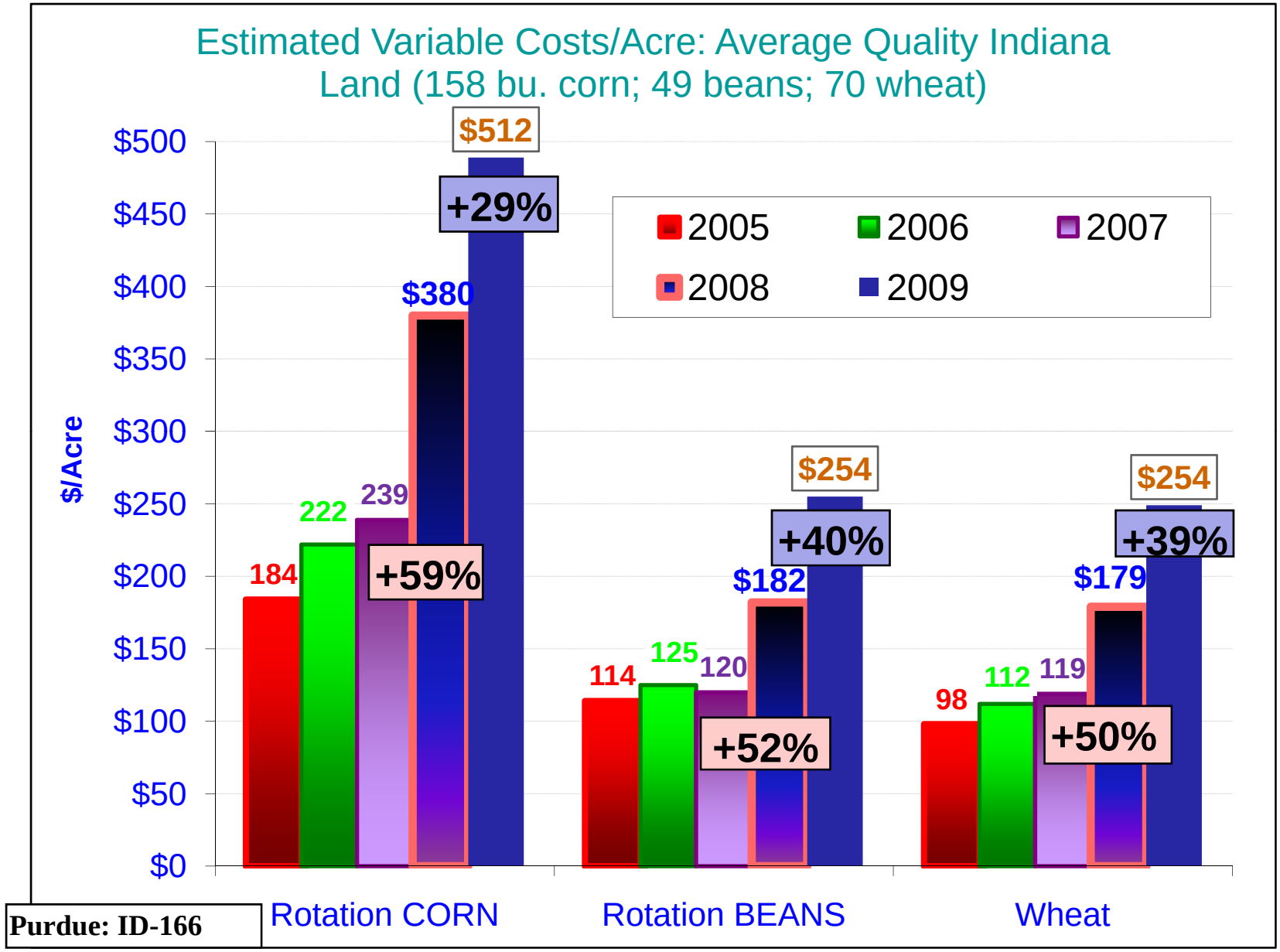


Purdue: ID-166

10 Step Risk Management Plan

1. Identify AREAS of Margin Risk

- Market Prices
- Yields
- Input Costs
- Land Lease Costs

2. Evaluate how each area could impact your business

a. Define the risk-reward trade offs
   -Downside risks
   -Upside Opportunities
b. Evaluate the implications of these tradeoffs for your business

3. Examine ways to manage margin risks

a. Costs control-Know your costs

-Withdraw from P & K fertility savings bank?

- Trim extra services-do them yourself

-Trim extra inputs

-Cut family living expenses

-Consider re-financing if interest rates drop enough

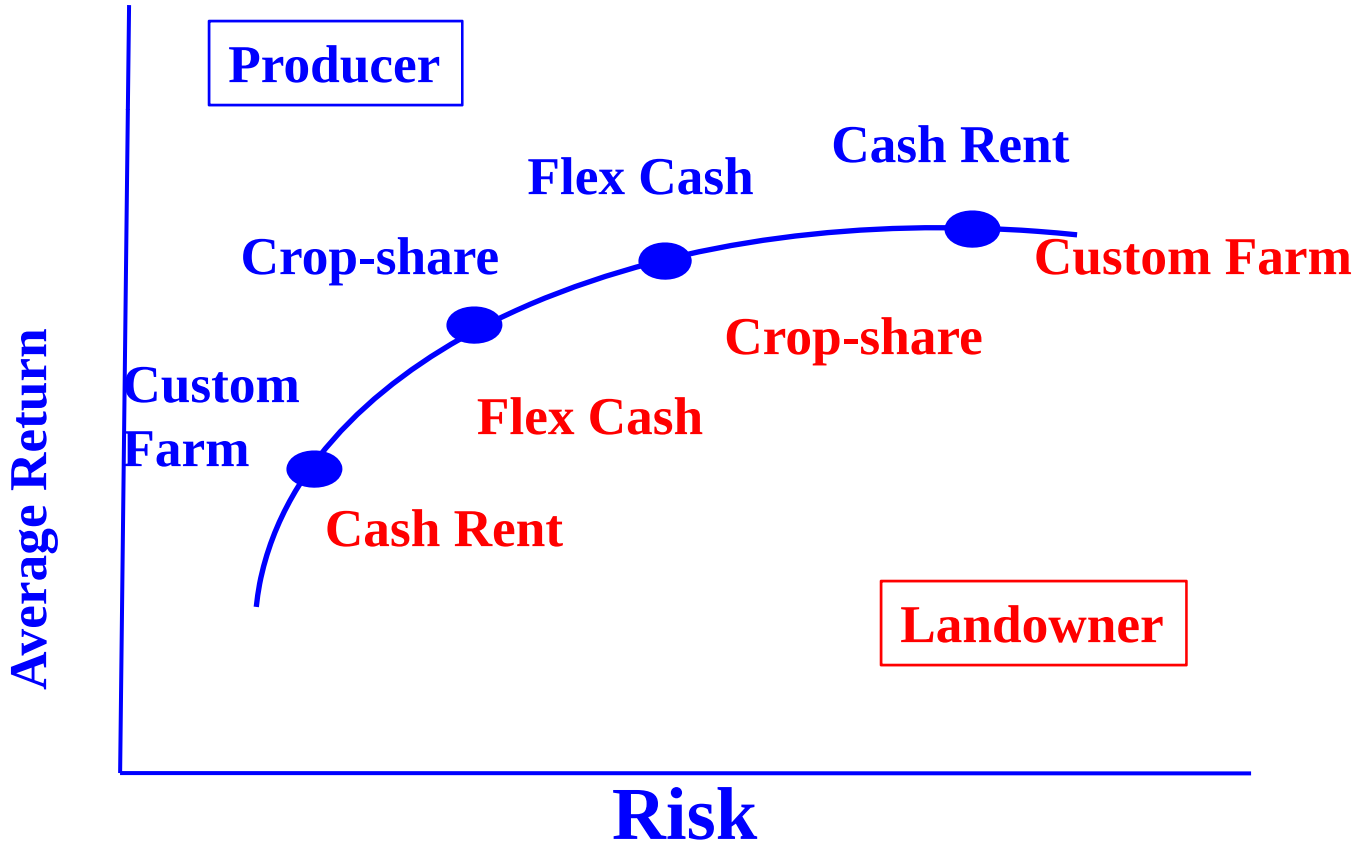
-Rotations

b. Lease arrangements

-Shift to lower risks rental arrangements

-Try to renegotiate lease terms/levels

Landowner/Producer Risk-Return Tradeoff



c. Government program alternatives

- **ACRE**
- **SURE**

Average Crop Revenue Election

State Level ACRE Guarantee > **Actual State Revenue**

AND

Farm Level ACRE Guarantee > **Actual Farm Revenue**

THEN

Farm Receives an ACRE payment based on ratio of farm's historical yield to State historical yield

Note: All Yields are Planted Acre Yields

Average Crop Revenue Election

State ACRE Guarantee = 90%
*** 5-Year Olympic State Avg. Yield ***
2-year Natl. Average Mkt. Yr. Price
Restricted to < 10% change/year

>

Actual State Revenue =
Actual State Planted Acre Yield *
MAX[Natl. Average Mkt. Yr. Price OR 70% Loan Rate]

AND

Farm ACRE Benchmark =
Farm's 5-Year Olympic Avg. Yield *
2-year Natl. Average Mkt. Yr. Price + Ins Premium

>

Actual Farm Revenue =Actual Farm's Planted Acre Yield *
MAX[Natl. Average Mkt. Yr. Price OR 70% Loan Rate]

THEN

Farm Payment = 0.833 (0.85 in 2012) * Actual Planted or Considered Planted Acres *
[Farm's 5-Year Olympic Average Yield / State's 5-year Olympic Average Yield] *
MIN[(State ACRE Guarantee – Actual State Revenue) OR State ACRE Guarantee * 25%]

Note: All Yields are Planted Acre Yields

Indiana Corn, Bean and Wheat Yields

5 Year Olympic Avg.

Year	Indiana Corn Yield	Indiana Bean Yield	Indiana Wheat Yield
2004	168	51.5	62
2005	154	49	72
2006	157	50	68
2007	154	46	56
2008	160	45	69
3 Year Avg.	157.0	48.33	66.33

2007 & 2008 Crop Prices?

	U.S. Corn Price	U.S. Soybean Price	U.S. Wheat Price
2007	$4.20	$10.10	$6.48
2008 (Feb 09)	$3.90	$9.25	$6.80
2007 & 08 Avg.	$4.05	$9.675	$6.64

Indiana State ACRE Guarantee for 2009????

		Yield	Price	Pay On	State Revenue Guarantee /Acre	Maximum payment = 25% of State Revenue Guarantee
09	Corn	157.0	*$4.05	* .90	$572	$143
09	Beans	48.33	*$9.675	*.90	$421	$105
09	Wheat	66.33	*$6.64	*.90	$396	$99

Costs to be in ACRE

- Will receive 20% LESS direct payments
  - Maybe $4 to $6 per average Indiana base acre
  - Depends on your farms bases and yields
- Loan levels are reduced by 30%
  - Not a factor if you do not tend to use the FSA loan program
  - If you do tend to use the loan program, then it's the costs of higher interest rates for your costs of capital vs. where the FSA office will lend to you
  - Maybe $2.00 to $3.00 per acre
- Total costs estimates per Indiana base acre
  - Maybe $4 to $8 per acre

2002 vs. 2008 Farm Bill ($/bu.)

	National Loan		Direct Payments	Target Prices	
	02 - 07	08 - 12	02 - 12	02 - 07	08 - 12
CORN	$1.95 (04-07)	$1.95	$.28	$2.63 (04 – 07)	$2.63
Soybeans	$5.00	$5.00	$.44	$5.80	$5.80 (08-09) $6.00 (10-12)
Wheat	$2.75 (04 – 07)	$2.75	$.52	$3.92 (04 – 07)	$3.92 (08-09) $4.17 (10-12)

Additional Interest Costs to Give up 30% of Loan

	Loan rate per bushel	30% Reduction	Assume 4% differential on interest rate	Assume 9 months of storage	Yield Per Acre	Higher Interest Cost/Acre
Corn	$1.95	*.30	*.04	*.75	*158=	$2.77
Beans	$5.00	*.30	*.04	*.75	*49 =	$2.21
Wheat	$2.75	*.30	*.04	*.75	*70 =	$1.73

Corn: 2009 Estimated Average Indiana Payments/ACRE

Dec 09 Futures = $3.90

09 Indiana State Yield

U.S. Average Price	146	149	152	155	**158**	161	164	167	170
$2.80	$136	$129	$122	$115	$108	$101	$94	$87	$80
$3.00	$112	$104	$97	$89	$82	$74	$67	$59	$52
$3.20	$88	$80	$72	$64	$56	$48	$40	$32	$24
$3.40	$63	$55	$46	$38	$29	$21	$12	$4	
$3.60	$39	$30	$21	$12	$3				
$3.80	$15	$5							
$4.00									
$4.20									
$4.40									
$4.60									
$4.80									

Beans: 2009 Estimated Average Indiana Payments/ACRE

Nov 09 Futures
= $8.30

09 Indiana State Yield

U.S. Average Price	45	46	47	48	**49**	50	51	52	53
$7.00	$88	$82	$76	$71	$65	$59	$53	$47	$42
$7.20	$81	$75	$69	$63	$57	$51	$45	$39	$33
$7.40	$73	$67	$61	$55	$49	$42	$36	$30	$24
$7.60	$66	$59	$53	$47	$40	$34	$28	$21	$15
$7.80	$58	$52	$45	$39	$32	$26	$19	$13	$6
$8.00	$51	$44	$37	$31	**$24**	$17	$11	$4	
$8.20	$43	$36	$30	$23	$16	$9	$2		
$8.40	$36	$29	$22	$15	$8	$1			
$8.60	$28	$21	$14	$7					
$8.80	$21	$13	$6						
$9.00	$13	$6							

Wheat: 2009 Estimated Average Indiana Payments/ACRE

U.S. Average Price	09 Indiana State Yield 62	64	66	68	**70**	72	74	76	78
$4.00	$99	$99	$99	$99	$97	$90	$84	$77	$70
$4.20	$99	$99	$99	$92	$85	$78	$71	$64	$57
$4.40	$99	$96	$88	$81	$74	$66	$59	$52	$44
$4.60	$93	$85	$77	$70	$62	$54	$47	$39	$31
$4.80	$82	$74	$66	$58	$50	$42	$34	$26	$18
$5.00	$72	$64	$55	$47	**$39**	$30	$22	$14	$5
$5.20	$62	$53	$44	$36	$27	$18	$10	$1	
$5.40	$51	$42	$33	$24	$15	$6			
$5.60	$41	$32	$22	$13	$4				
$5.80	$31	$21	$11	$2					
$6.00	$20	$10							

SURE - Disaster Assistance

- SUpplemental REvenue Assistance Program
- Participation requires that all crops be insured at CAT level or higher
- NAP (Non-insured Assistance Plan) for uninsurable crops ($250/crop/county)
- Pasture and minor crops are excluded
- Whole farm loss must exceed 50% or county be declared as disaster area

SURE - Disaster Assistance

- Revenue guarantee is capped at 90% of expected crop revenue
- Payment is 60% of the loss
- Usefulness for risk management in Indiana is limited because of limited yield variability

d. Crop insurance alternatives

- Many insurance products available

  Individual-based coverage

  County-based coverage

  How well do your yields track with county?

  Is prevented planting/replant coverage important to you? (enterprise unit ?)

  Do you qualify for biotec discount?

  Is grain quality an issue

Crop Insurance Alternatives

- Yield insurance or Revenue insurance

  Revenue insurances have higher premiums

  (so do many marketing tools)

  Are you forward pricing?

  Spring - higher price window?

  What level of coverage?

  What unit for insurance?

Crop Insurance Alternatives

- Forward pricing in early Spring tends to increase average revenue and downside risk
- Crop insurance provides higher 5% VaR (downside protection) at little or no cost
- HIGHER INCOME AND LOWER RISK
- Evaluate your situation and work with a knowledgeable crop insurance agent

e. Market pricing alternatives

- Prices are critical to margins-Impact all of the revenues.
- Research suggest that it is difficult to do better than the average market price over time.
- Objective is to achieve a pricing performance of 2% to 5% above the average for peers in your area.
- Use diversification in marketing timing and strategies; Plus your marketing knowledge to achieve this.
- On average, the average producer easily survives

Hints From History

- Old crop prices for corn and soybeans tend to peak in the late winter through planting time.
- Storage into summer tends to not pay on average-consider
  - Selling cash grain by June 15,
  - And replace with futures or call options if still bullish
- Spring pricing window has tended to provide 20 to 40 cents per bushel higher prices than taking the harvest price—consider 25% to 35% priced for new crop.

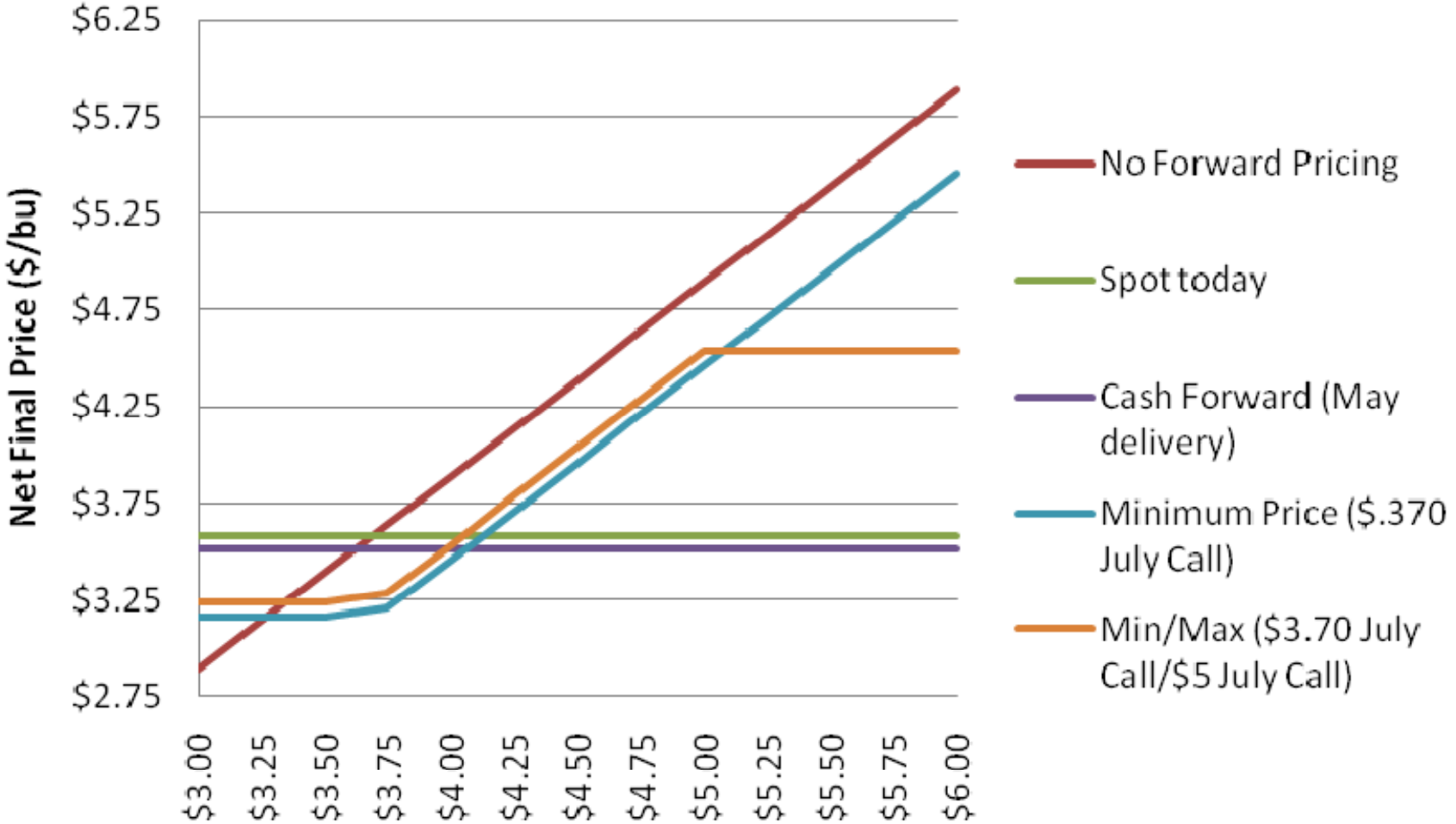
Hints From History

- Consider putting some bushels in your elevator's spring pricing window program
- Moving above 50% priced by planting time probably should be done with options.
- With storage you want to take advantage of spring pricing window and earn as much carry from storage as possible
- Read signals each year and consider adjustments. But limit the amount of adjustment so you still have adequate diversification

Old Crop Pricing Example

- Using February 23, 2009 prices
- July 2009 Corn Futures: $3.71
- Assume Basis: ($0.11), i.e. 11 under
- July 2009 $3.70 Call: $0.40
- July 2009 $5.00 Call: $0.10

Payoff Diagram: Old Crop Corn Pricing Alternatives



New Crop/Pre-Harvest Pricing

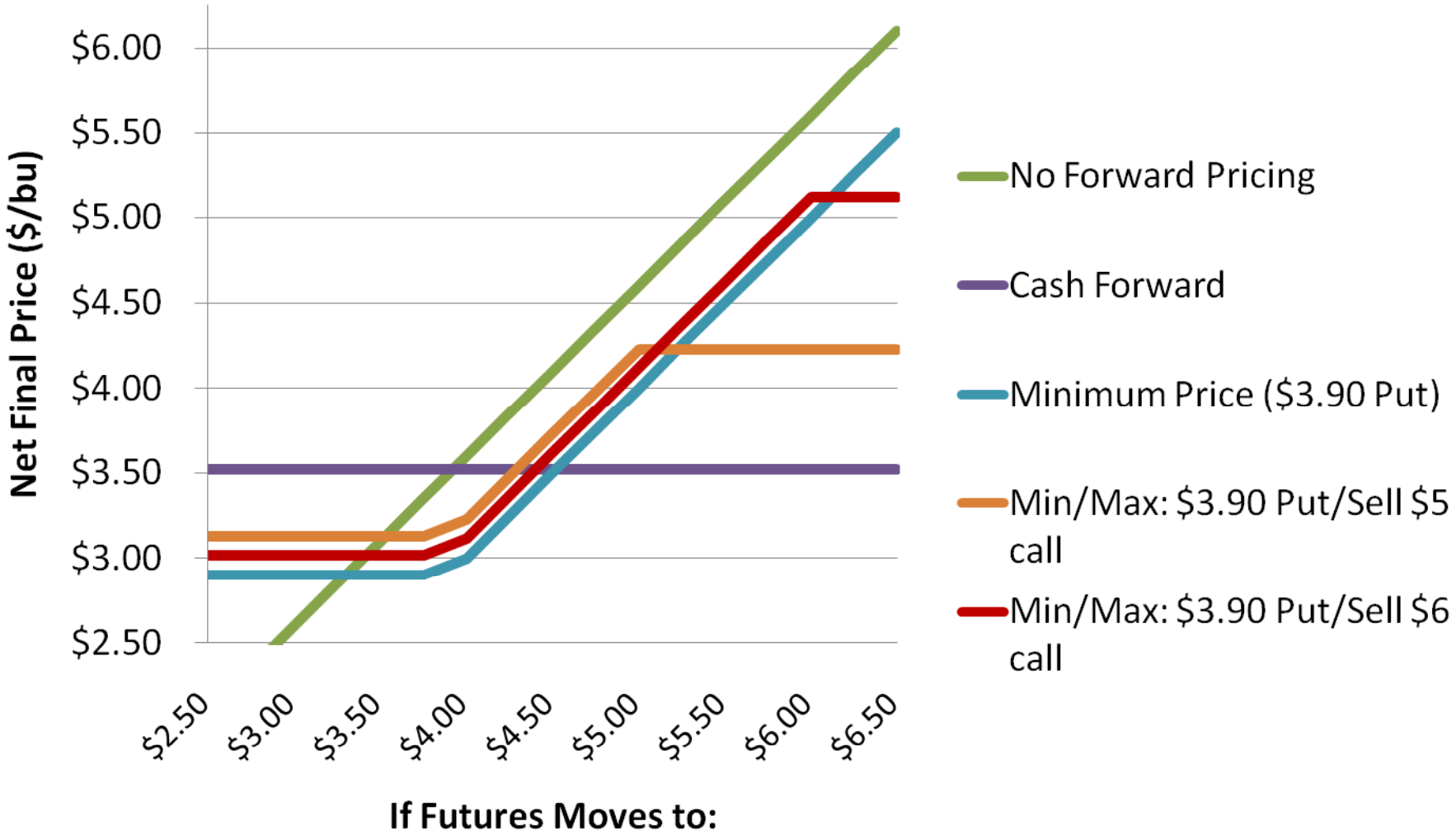
- Pricing strategies that tend to work well in the Pre-harvest period include:
  - Forward cash contracts
  - Minimum Price contracts
  - Min/Max Contracts

  - Selling futures to hedge
  - Buying put options

New Crop Pricing Example

- Using February 23, 2009 prices
- Dec 2009 Corn Futures: $3.91
- Assume New Crop Basis: ($0.40), i.e. 40 under
- Dec 2009 $3.90 Put: $0.58
- Dec 2009 $5.00 Call: $0.25
- Dec 2009 $6.00 Call: $0.14

New Crop Corn Payoff Diagram: Pre-Harvest Pricing Alternatives



4. Evaluate individual farm financial position

Financial Measures

- Debt/Asset Ratio

- Cash Flow Requirements/Expected Gross

	Oscar Owner (Owns 100% land)	Tom Typical (Owns 50% land)	Chad Cash Rent (Owns 0% land)
Land	$400,000	$400,000	$400,000
Machinery	$100,000	$100,000	$100,000
Total Assets	$500,000	$500,000	$500,000
Liabilities	-$50,000	-$200,000	-$350,000
Net Worth	$450,000	$300,000	$150,000
Debt/Asset Ratio	**.10**	**.40**	**.70**
Cash Required	$73,000	$95,000	$112,000
Expected Gross	$120,000	$120,000	$120,000
Cash/EG	60.8%	79.2%	93.3%

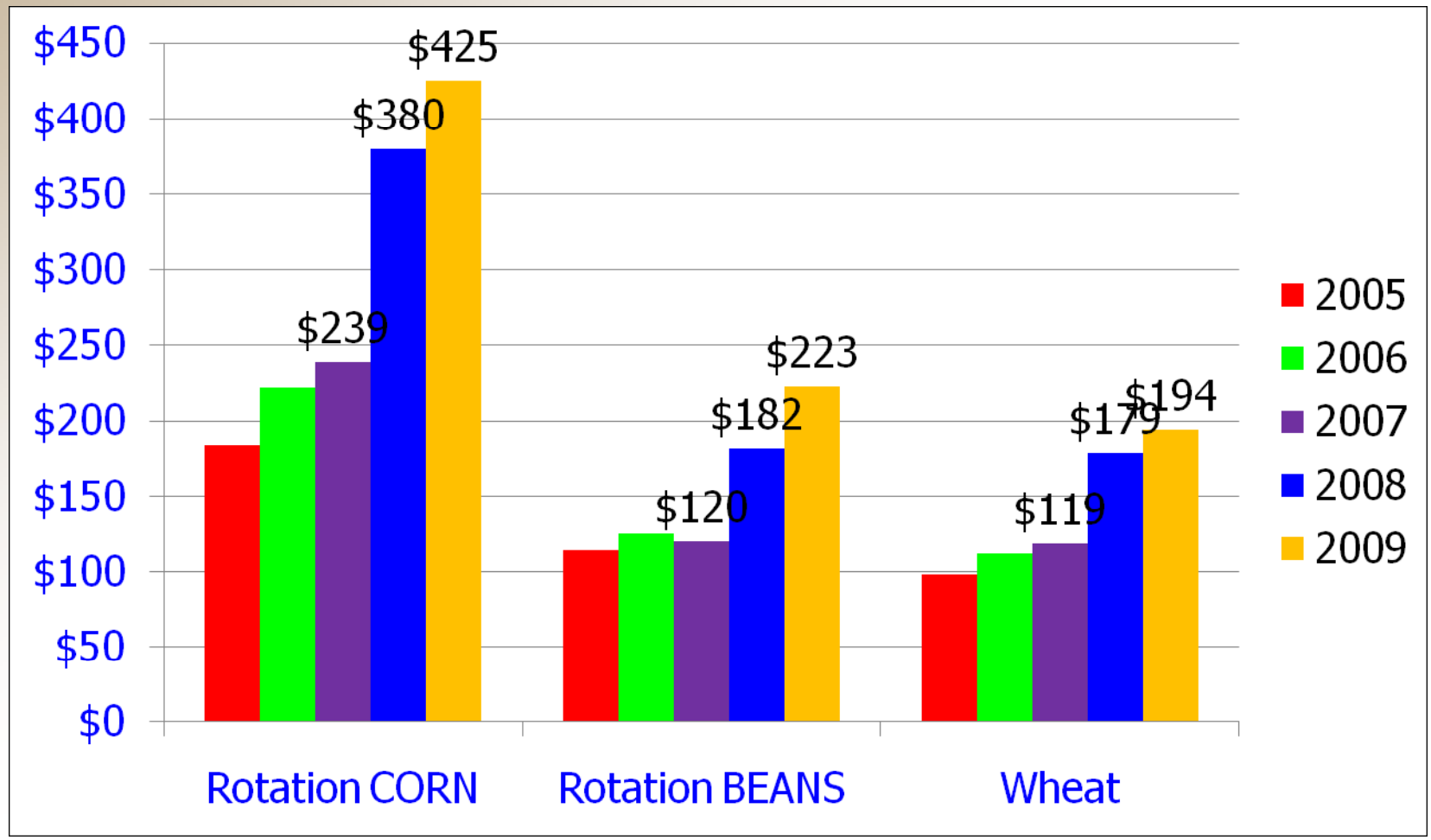
5. Evaluate individual ability and willingness to take risks

Ability depends on debt and cost structure

Willingness depends on how the farm family deals with risk

- Can you sleep at night?

Estimated Variable Costs/Acre: Average Quality Indiana Land (158 bu. corn; 49 beans; 70 wheat)



Example Variable Costs (corn)

• Fertilizer $/Acre	**$180.00**
• Seed $/Acre	**$ 89.00**
• Pesticides $/Acre	$ 41.00
• Machinery fuel & repairs $/Acre	**$ 30.00**
• Custom work & seasonal hired labor $/Acre	$ -
• Crop insurance $/Acre	$ 27.00
• Interest and other expenses $/Acre	**$ 17.00**
• Drying charge $/Acre	**$ 24.00**
• Storage handling charge $/Acre	**$ 17.00**
• **Total variable cost $/Acre**	**$ 425.00**

Example Fixed Costs (corn)

• Machinery/building ownership cost ($/year)	$150,000
• Labor cost (unpaid and hired labor) ($/year)	$ 80,000
• Utilities (Electricity, gas, telephone…) ($/year)	$ 3,600
• **Total fixed cost (2,000 Acre) ($/Acre)**	**$ 117**
• Land use cost ($/Acre)	$ 170
• **TOTAL COST (variable + fixed) ($/Acre)**	**$ 712**

Calculating Breakeven Price

• Crop value (yield*price) ($/Acre)	$ **692**
• Government payment ($/Acre)	$ 20
• Crop insurance ($/Acre)	$ -
• Variable cost ($/Acre)	$ 425
• Fixed cost ($/Acre)	$ 117
• Land use cost ($/Acre)	$ 170
	$ 0

Corn Total Cost Breakeven

Yield	Total Cost Breakeven (fertilizer costs constant)	Total Cost Breakeven (fertilizer based on expected yield)
130	$5.32	$5.03
150	$4.61	$4.61
180	$3.84	$3.88
200	$3.46	$3.54

Soybeans Total Cost Breakeven

- Variable cost for soybeans are $223 per acre, fixed cost $117 and land $170 per acre. Government payment $20 per acre.

Soybean Total Cost Breakeven

Yield	Total Cost Breakeven (fertilizer costs constant)	Total Cost Breakeven (fertilizer based on expected yield)
45	$10.89	$10.71
50	$9.80	$9.80
55	$8.90	$9.07
60	$8.17	$8.47

How does your farm financial position affect your breakeven?

- Your ability to bear risk is affected by your cash flow requirements.

- What price do you need to cover your cash flow needs?
  - **Cash Flow Breakeven**

Corn Cash Flow Breakeven

(assume same fertilizer, vary land costs)

Yield	Oscar Owner (Owns all land)	Tom Typical (Owns 50% land)	Chad Cash Rent (Owns 0% land)
130	$4.02	$4.66	$5.32
150	$3.48	$4.05	$4.61
180	$2.90	$3.37	$3.84
200	$2.60	$3.04	$3.46

Corn Cash Flow Breakeven

(assume same fertilizer, vary land costs, "live off of depreciation")

Yield	Oscar Owner (Owns all land)	Tom Typical (Owns 50% land)	Chad Cash Rent (Owns 0% land)
130	$3.43	$4.09	$4.75
150	$2.98	$3.55	$4.11
180	$2.48	$2.95	$3.43
200	$2.24	$2.66	$3.09

6. Evaluate overall economic environment

- Fundamental drivers of bullish market all turned bearish last summer
- Financial crisis is real, and recession will be long and deep
- The bottom may not yet be in for stock/ag markets
- Expect more movement to the down side than to the upside in 2009
- Best guess is that recession will continue through this year and into early 2010
- Expect recovery to be slow-No booms back to high prices, but with possibilities of somewhat greater inflation in the longer-run

So What, If the Optimists Prevail??

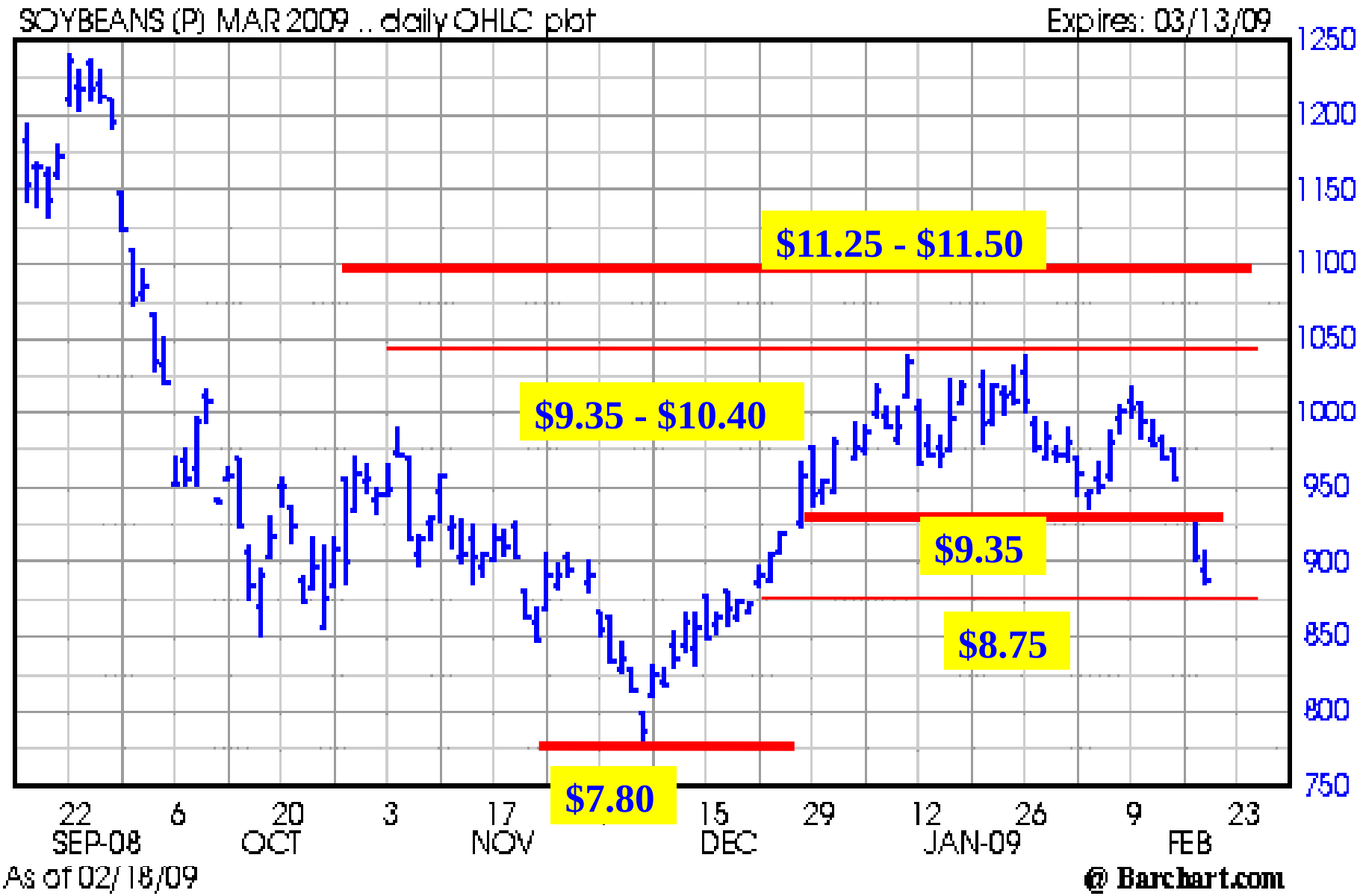
2008-09 –Mid-2010??

- Deflation price tendencies?
- Low crop and animal prices
- Declining input costs including feed
- Cutting breeding herds/flocks
- Tight margins
- Cuts in tax rates
- Declining (low) interest rates
- Business incentives to invest
- Softening cash rents and land values

Mid-2010 to 2015??

- Some inflation tendencies
- Rising interest rates
- Rising crop and animal prices
- Rising input costs and higher feed
- More favorable margins
- Higher income tax rates
- Stable to higher cash rents and land values

7. Evaluate the outlook for each risk area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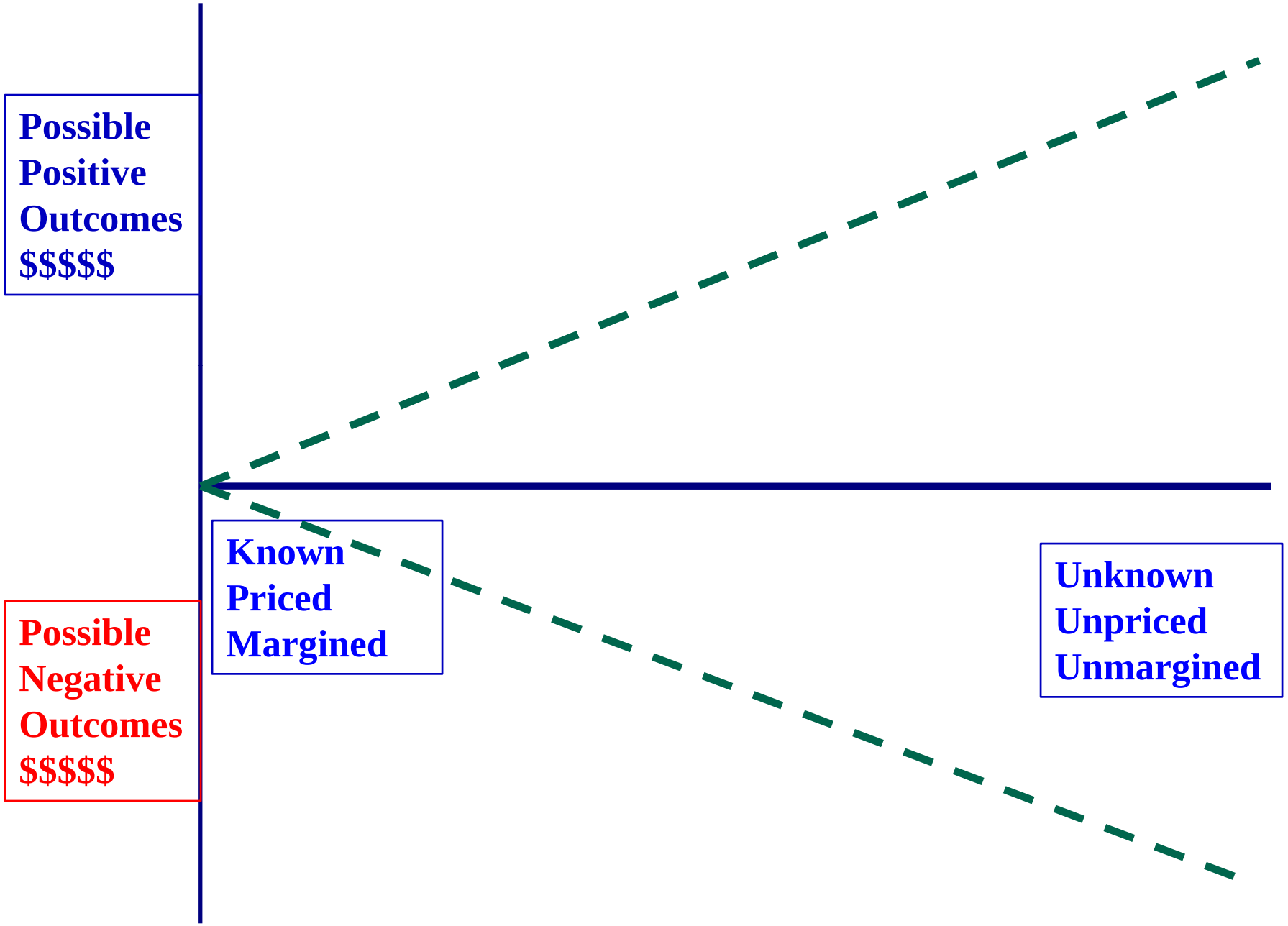
8. Evaluate strategies for managing margin risk

Rapidly Changing Environment

Time Exposure


Possible
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Outcomes
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Risk Management Concepts

1. Define and/or review business mission/objectives
2. Examine/define your risk/reward tradeoffs
3. Reduce time exposure: Margin-Margin-Margin: Buy inputs and price outputs
4. Diversification in purchasing inputs and pricing outputs-Think 2% to 5% above average

   -Diversify over time

   -Diversify over strategies
5. Increase financial strength to extent you can
6. Turn from aggressive (offensive) to conservative (defensive) management

Consider Timing Risks Due to When You Establish Input Costs and Crop Prices

----------Quarters----------

Spring 09	Summer 09	FALL 09	Winter 10	Spring 10	Summer 10
H-2	H-1	HARVEST	H+1	H+2	H+3
Market Price						
Input Costs						

9. Select and implement a risk management strategy

10. Review results and outcomes-learn and modify as needed.

Assignments

- Follow the 10-steps to write your margin risk management plan

Course Website

- http://www.agecon.purdue.edu/extension/programs/marginrisk.asp
- Scroll down to where it says "Login to course website"
  - Login: **margin**
  - Password: **risk2009**

- To email in questions, either give them to your host or send them to Corinne Alexander: cealexan@purdue.edu