FARM BUSINESS MANAGEMENT

FARM ECONOMICS Facts & Opinions

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July 13, 2007 **FEFO 07-12**

Consider Higher Costs and Additional Risk When Negotiating 2008 Cash Rents

Cash rents likely will rise for the 2008 cropping year as a result of higher expected commodity prices. While higher commodity prices will increase farmland returns, caution should be exercised in increasing cash rents. Higher production costs and lower government payments will offset some of the revenue increases from higher commodity prices. Moreover, additional risk associated with crop farming suggests that farmers should receive a larger portion of returns. If cash rents increase so that a farmer receives the same margin in 2008 as in 2001 through 2005, farmers will be in much riskier positions. In central Illinois, farmer margins need to more than double for farmers to be in the same risk position in 2008 as compared to 2001-2005.

Historic Returns Compared to 2008 Budgets

Actual revenues and costs from 2001-2005 compared to projected 2008 returns illustrates changes in returns. The period 2001-2005 represents a period of lower commodity prices (2006 is excluded as commodity prices began to rise in that year). Historical yields, revenues, and costs are shown for corn and soybeans in the first two columns of Table 1. These averages come from central Illinois grain farms enrolled in Illinois Farm Business Farm Management (FBFM) with high productivity farmland. Budgets for 2008 are shown in the final two columns of Table 1.

In 2001-2005, central Illinois farmers received an average of $2.22 for corn and $5.89 for soybeans (see Table 1). Projected 2008 prices based on Chicago Board of Trade (CBOT) futures contracts are significantly higher than 2001-2005 prices. A $3.50 corn price and $8.50 soybean price are used in 2008 budgets. Given higher projected prices, crop revenue will be above 2001-2005 averages. Corn crop revenue is projected at $623 per acre in 2008, an increase of $236 over the 2001-2005 level of $387 per acre. Soybean revenue is projected at $442 per acre in 2008, a $142 increase over the 2001-2005 average.

Offsetting some of the projected crop revenue gains are higher costs. Total non-land costs for corn are projected at $314 in 2008, an increase of $57 per acre from 2001-2005 level of $257 per acre (see Table 1). The largest increases come from fertilizer ($27 per acre), seed ($11), crop insurance ($5), fuel and oil ($5), and interest ($5). Total non-land costs for soybeans are projected at $199 in 2008, an increase of $28 per acre over the 2001-2005 level of $171 per acre. Soybean cost categories with the highest increases include seed ($9 per acre), fertilizer ($8), fuel and oil ($5), and interest ($5).

Also offsetting higher crop revenues are lower projected government payments. Exact commodity programs will not be known until the 2007 Farm Bill is passed. Budgets in Table 1 assume a continuation of the 2002 Farm Bill. In 2001-2005, loan deficiency payments (LDPs) averaged $29 per acre for corn and $14 per acre for soybeans. Projected 2008 commodity prices result in no LDPs. Other government payments include direct and counter-cyclical payments. In 2001-2005, other government payments averaged $35 per acre. The $35 includes counter-cyclical payments. Counter-cyclical payments are not projected for 2008 projected prices. As a result, other government payments decline to $27 per acre.

Table 1. Historical and 2008 Estimated Crop Returns and Costs, Central Illinois High Productivity Farmland.

	Averages for 2001-2005		2008 Budgets	
	Corn	Soybeans	Corn	Soybeans
Yield per acre	174	51	178	52
Price per bu	$2.22	$5.89	$3.50	$8.50
LDP per bu	0.17	0.27	0.00	0.00
Crop revenue	$387	$300	$623	$442
LDP revenue	29	14	0	0
Other government payments	35	35	27	27
Crop insurance proceeds	6	3	0	0
Gross revenue	**$457**	**$352**	**$650**	**$469**
Fertilizers	$63	$22	$90	$30
Pesticides	$37	30	40	26
Seed	$37	25	48	34
Drying	$9	2	9	2
Storage	$7	3	9	4
Crop insurance	$6	4	11	8
Total direct costs	**$159**	**$86**	**$207**	**$104**
Machine hire/lease	$6	$5	$6	$5
Utilities	4	3	4	3
Machine repair	12	10	13	11
Fuel and oil	9	8	14	13
Light vehicle	1	1	2	1
Mach. depreciation	23	20	20	18
Total power costs	**$55**	**$47**	**$59**	**$51**
Hired labor	$8	$8	$8	$8
Building repair and rent	4	2	3	2
Building depreciation	5	3	4	2
Insurance	7	7	9	9
Masc.	6	6	6	6
Interest (non-land)	13	12	18	17
Total overhead costs	**$43**	**$38**	**$48**	**$44**
Total non-land costs	**$257**	**$171**	**$314**	**$199**
Operator and land return	**$200**	**$181**	**$336**	**$270**
Operator and land returns for[2]:				
1/2 corn -- 1/2 soybeans	$199		$314	
2/3 corn -- 1/3 soybeans	$194		$314	
all corn	$183		$314	

[1] Averages for grain farms enrolled in Illinois Farm Business Farm Management.

[2] The corn results represent a blend of corn-after-soybeans and corn-after-corn returns. For calculating operator and farmland returns, corn-after-soybeans is assumed to yield 5 bushels more than the corn shown above while corn-after-corn is assumed to yield 5 bushels less. Corn-after-soybeans is assumed to have $5 less costs than above and corn-after-corn is assumed to have $5 more costs.

Operator and farmland returns equal total revenue minus non-land costs. In 2001-2005, operator and farmland returns averaged $257 per acre for corn and $171 per acre for soybeans. Given a ½ corn – ½ soybeans rotation, operator and farmland return averaged $199 per acre (see Table 1). This means that there were $199 per acre to split between the landlord and the farmer. If cash rent averaged $150 per acre, farmers received an average return of $49 per acre. For 2008, operator and farmland returns are projected at $314 per acre for the ½ corn – ½ soybean rotation, an increase of $115 over the 2001-2005 average.

Additional Risk

Farmers will face additional risk for three reasons. First, price variability likely will be higher over the next several years. Reasons why are detailed in *2007 U.S. Corn Production Risks: What Does History Teach Us?"* (www.farmdoc.uiuc.edu/marketing/mobr/mobr_07-01/mobr_07-01.html). Evaluating standard deviations from an option pricing model illustrates these increases. Table 2 shows expected values and standard deviations for 2002 through 2007 implied by CBOT contracts at the end of February of each year. These statistics represent the expected value and variability of the December contract for corn and the November contract for soybeans.

Table 2. Expected Prices and Variability of Harvest Time Futures Contracts Implied by Futures and Options Contracts in February.[1]

	Corn			Soybeans		
Year	Expected Value	Standard Deviation	C.V.[2]	Expected Value	Standard Deviation	C.V.[2]
2002	2.32	0.43	0.19	4.56	0.83	0.18
2003	2.40	0.46	0.19	5.22	0.85	0.16
2004	2.95	0.65	0.22	7.36	1.68	0.23
2005	2.40	0.53	0.22	6.10	1.35	0.22
2006	2.65	0.63	0.24	6.20	1.41	0.23
2007	3.91	0.99	0.25	7.96	1.64	0.21

[1] Expected values and standard deviations are implied from futures and options contracts at the end of February of each year. The December contract is used for corn and the November contract for soybeans.

[2] Coefficient of variation equals standard deviation divided by the expected value.

Standard deviation estimates for corn are .43 in 2002, .46 in 2003, and .65 in 2004 (see Table 1). This represents the period before commodity prices increased because of ethanol demand. In 2007, the standard deviation estimate is .99, roughly twice that of levels in 2002 and 2003. Similarly, the estimate of soybean price standard deviation is 1.64, roughly twice that of the 2002 level of .83 and the 2003 level of .85.

The second reason risk will increase is because Federal commodity programs will not provide as much downside price protection. A continuation of the 2002 Farm Bill would cause loan rates and target prices to be significantly below expected prices. For example, corn prices must fall by about $1.50 per bushel before LDPs result given a $3.50 per bushel expected corn price. In 2001-2005, expected prices were closer to $2.00, meaning that prices had to fall very little before LDPs were received.

Three, revenue for crop insurance must fall more in periods of high prices before insurance payments are received. A revenue product sets its guarantee by multiplying the coverage level by the Actual Production History (APH) yield times an expected price. As the expected price increases, larger revenue losses must occur before crop insurance makes payments. As an example, take a farm with a 160 bushel APH yield using a 75% coverage level. Under a $2.50 base price, the revenue guarantee is $300 per acre (160 bushel APH yield x $2.50 price x .75 coverage level). In this case, revenue has to fall $100 from its expected level of $400 (160 bushels APH yields x $2.50 expected price) before payments occur. Under a $3.50 base price, the revenue guarantee is $420. In this case, revenue has to fall $140 from its expected level of $560 before crop insurance makes payments.

Farmer Margins and Risks

To quantify additional risks, possibilities of negative farmer returns are examined for price and yield combinations representing 2001-2005 and 2008. For these two scenarios, costs for corn and soybeans are taken from Table 1. Relative to 2001-2005, costs for 2008 are $57 per acre higher for corn and $28 per acre higher for soybeans. Prices and yields are drawn from distributions whose means and standard deviations are shown in Table 3. Price means represent the average for 2001-2005 while 2008 are projections. Price standards deviations for 2001-2005 represent the average standard deviation for 2002 through 2005 (see Table 2) while 2008 price standard deviations are based on the implied standard deviations from option contracts in February 2007 (see Table 2). Expected yields are higher in 2008 to account for trend yield increases. Yield standard deviations for 2001-2005 and 2008 are assumed to be the same and have been determined using historical yields from FBFM farms.

Returns are simulated under the two scenarios assuming that the 2002 Farm Bill is in place. LDPs result when prices are below loan rates ($1.95 per bushel for corn and $5.00 per bushel for soybeans). Counter-cyclical payments result when prices are below target prices less direct payment ($2.35 for corn and $5.36 for soybeans). Corn and soybeans are grown in a ½ corn – ½ soybean rotation. Crop Revenue Coverage (CRC) crop insurance polices are taken out on both corn and soybeans at 75% coverage levels.

Table 3. Yield and Price Parameters Used in the Simulations.

	Scenario	
	2001-2005	Projected 2008
Corn Price		
Mean	2.22	3.50
Standard deviation	0.52	0.99
Soybean Price		
Mean	5.90	8.00
Standard deviation	1.18	1.64
Corn Yields		
Mean	179	182
Standard deviation	21	21
Soybean Yields		
Mean	51	52
Standard deviation	7	7

Results of this risk comparison are shown in Table 4. Comparisons are illustrated for a $50 expected farmer margin. In 2001-2005, a $50 expected farmer margin implies a $149 cash rent (see Table 4). Given a $50 expected farmer margin, the chance of having a negative margin is 11%. When the farmer margin is negative, the average farmer margin is -$19 per acre (see Table 4).

The cash rent associated with a $50 expected farmer margin in 2008 is $264 per acre. Given a $264 cash rent in 2008, the chance of having a negative farmer margin is 35% (see Table 4). Hence, setting the cash rent so that the expected farmer margin is $50 in 2001-2005 and in 2008 increases the chance of negative farmer margins from 11% (1 in 10 years) to 35% (over 1 in 3 years). Moreover, the severity of losses increases when they occur. At a $50 expected farmer margin, the average farmer margin when the farmer

margin is negative is -$19 per acre in 2001-2005 compared to -$64 per acre in 2008 (see Table 4).

To have the same risk in 2008 as in 2001-2005, farmers must receive significantly higher expected farmer margins. To have the same chance of negative margins of 11% associated with a $50 farmer margin in 2001-2005, the expected farmer margin needs to be $135 per acre in 2008, implying a cash rent of $179 per acre (see Table 4). In all cases shown in Table 4, expected farmer margins must more than double for the same chance of negative returns in projected 2008 conditions as in 2001-2005.

Table 4. Comparison of Returns and Risks Under Average 2001-2005 Conditions and Projected 2008 Conditions, Central Illinois High Productivity Farmland.

Expected Farmer Margin	Cash Rent		Chance of Negative Farmer Margin		Avg. Farmer Margin When Margin is Negative	
	2001-2005	2008P	2001-2005	2008P	2001-2005	2008P
$25	$174	$289	28%	43%	-$24	-$75
30	169	284	26%	41%	-23	-72
35	164	279	20%	40%	-22	-70
40	159	274	17%	39%	-21	-68
45	154	269	14%	37%	-20	-66
50	149	264	11%	35%	-19	-64
55	144	259	9%	34%	-19	-62
60	139	254	7%	32%	-18	-60
65	134	249	5%	31%	-17	-57
70	129	244	4%	29%	-16	-56
75	124	239	3%	28%	-15	-53
80	119	234	2%	26%	-14	-51
85	114	229	2%	24%	-14	-49
90	109	224	1%	23%	-14	-46
95	104	219	1%	22%	-13	-44
100	99	214	1%	20%	-11	-43
105	94	209	*	19%	-9	-40
110	89	204	*	18%	-8	-38
115	84	199	*	16%	-7	-36
120	79	194	*	15%	-6	-34
125	74	189	*	14%	-4	-31
130	69	184	*	13%	-2	-30
135	64	179	*	11%	-2	-28
140	59	174	*	9%	-1	-27

* Indicates less than 1% chance.
2008P stands for projected 2008 conditions

Summary

Increased risk during the upcoming year suggests caution in increasing cash rents. Much larger farmer margins will need to be in place for similar risk levels as compared to the 2001-2005.

Given the increase in risk, rental arrangements that changes payments to landlords based on realized price and yield outcomes may be warranted. These arrangements would allow farmers to decease their shares of farmland returns while maintaining the same risk position. Leases that vary payments include share rent leases, share with supplemental rent leases, and flexible cash leases.

Acknowledgments

Data used in this study comes from the local Farm Business Farm Management (FBFM) Associations across the State of Illinois. Without their cooperation, information as comprehensive and accurate as this would not be available for educational purposes. FBFM, which consists of 6,000 plus farmers and 60 professional field staff, is a not-for-profit organization available to all farm operators in Illinois. FBFM field staff provides on-farm counsel with computerized recordkeeping, farm financial management, business entity planning and income tax management. For more information, please contact the State FBFM Office located at the University of Illinois Department of Agricultural and Consumer Economics at 217-333-5511 or visit the FBFM website at www.fbfm.org.

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