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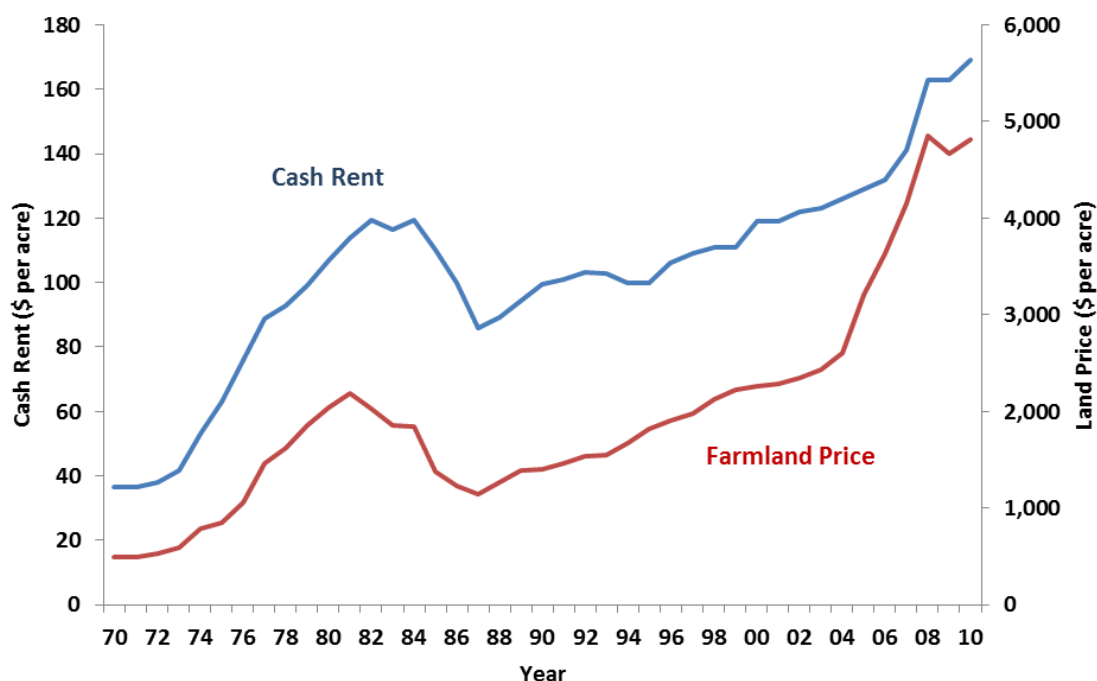
FARMLAND PRICE OUTLOOK: ARE FARMLAND PRICES TOO HIGH RELATIVE TO RETURNS AND INTEREST RATES?

Unlike many other assets, farmland prices have not fallen during the recent troubled economic times. This has led to questions on whether farmland prices will have large price declines similar to those experienced by many stocks during 2009 or by farmland during the 1980s. In this article, evidence is presented suggesting that land price declines are not likely in the near future. Before a large farmland price decline will occur, farmland returns likely will have to decrease or interest rates will have to increase. Either could occur, but neither seems likely in the near future. Over the next year, farmland returns are likely to increase because of above average commodity prices. Interest rates increases do not appear likely within the next year or two as the Federal Reserve seems intent on implementing more quantitative easing. In the longer-run, however, interest rate increases could occur, leading to declining farmland prices.

Illinois Farmland Prices

The U.S. Department of Agriculture regularly reports cropland prices and cash rents for the state of Illinois (see Figure 1 and Appendix Table 1). These data are used to evaluate trends in farmland prices and to evaluate whether farmland prices have increased more than would be warranted by changes in farmland returns and interest rates.


Figure 1. Illinois Average Cash Rents and Farmland Prices, 1970 - 2010.

The last time farmland prices declined was during the agricultural financial crisis of the mid-1980s. During this crisis, average farmland prices decreased from $2,023 per acre in 1981 to $1,149 per acre in 1987, a decline of 43% over a five-year period.

Between 1987 through 2004, farmland prices averaged an yearly increase of 4.8% per year. Then farmland prices entered into a period of rapid rise, increasing by an average of 15% between 2004 and 2008. These price increases were caused by demands for converting farmland to housing and other commercial uses. These development demands had a rippling effect, even impacting farmland that had no possibilities of development, as many individuals who sold farmland for development purchased farmland elsewhere, often using a 1031 exchange provision in the tax code to shelter gains from immediate taxation.
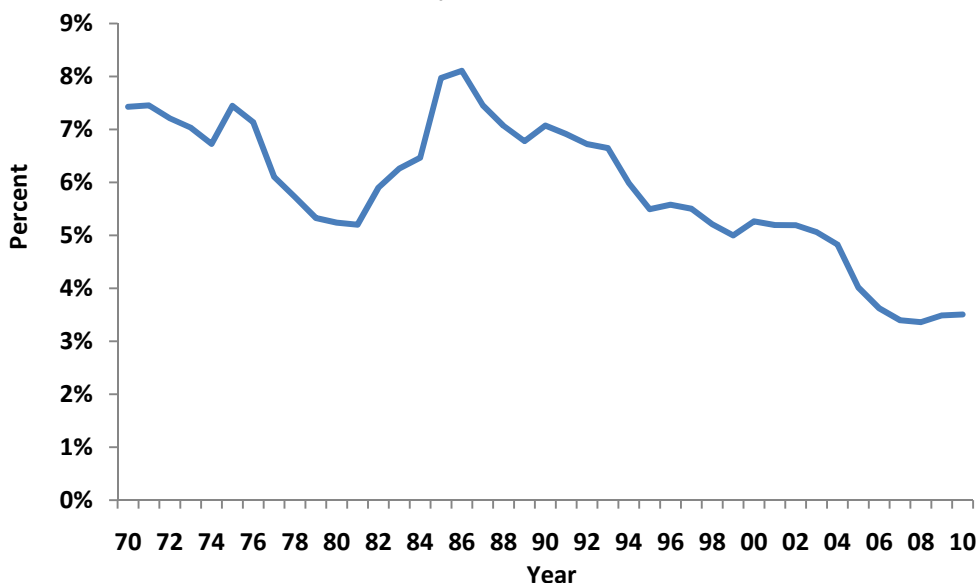
Development demands diminished greatly in 2007 and 2008. This diminished demand could have led to decreasing farmland prices; however, commodity prices increased at roughly the same time that development pressures subsided. Commodity price increases then led to higher farmland returns, providing support for farmland prices. The U.S. Department of Agriculture indicated that prices were relatively stable between 2008 and 2010: $4,850 in 2008, $4,670 in 2009, and $4,820 in 2010.

Farmland Price and Cash Rents

Cash rents represent the land owners' return to farmland. Like prices, cash rents have increased since 1987 (see Figure 1). Cash rents rose from $86 per acre in 1987 to $129 per acre in 2005, having an average yearly increase of 2%. Between 2006 and 2008, cash rent increased rapidly due to increases in commodity prices. Cash rents increased from $129 per acre in 2005 up to $163 per acre in 2008, an average yearly increase of 11%. The U.S. Department of Agriculture reported cash rent were relatively stable between 2008 and 2010: $163 in 2008, $163 in 2009, and $169 in 2010.

While both farmland prices and cash rents have increased since 1987, farmland prices have increased faster than cash rents, as illustrated by changes in "cash returns as a percent of farmland price". In 1986, cash rent as a percent of farmland price was 8.1%, the highest level during the period between 1972 and 2010 (see Figure 2). Since 1987, cash rent as a percent of farmland price decreased, reaching a low of 3.4% in 2008. Cash rents as a percent of farmland price increased slightly to 3.5% in 2009 and 2010.


Figure 2. Cash Rent as a Percent of Land Price, Illinois, 1970 - 2010.
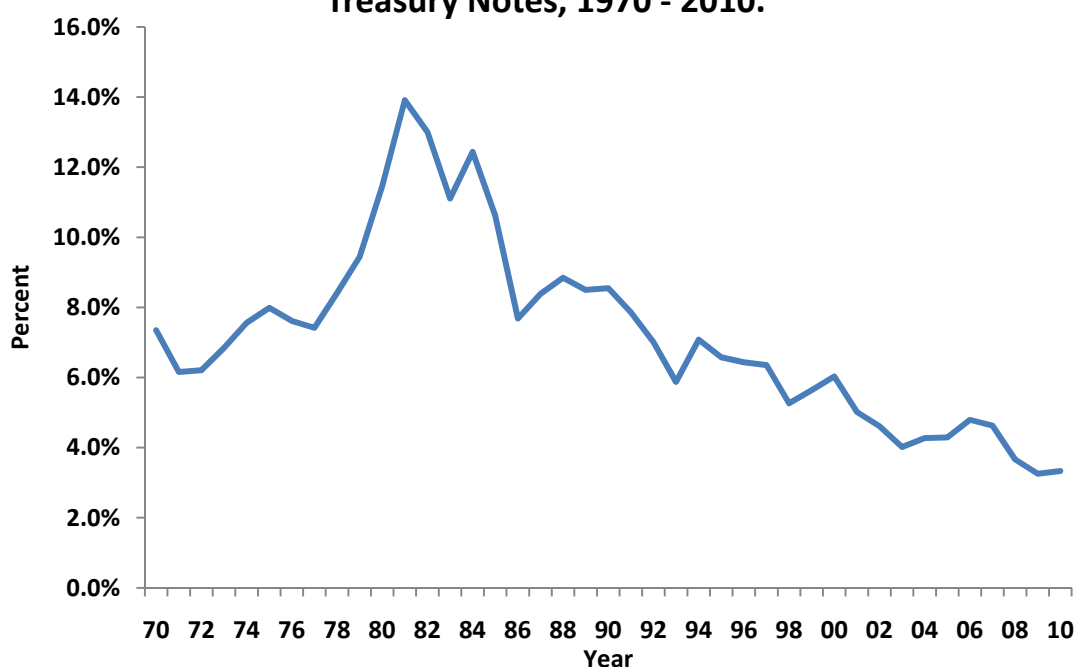
Declining rents as a percent of price may indicate concern for future farmland price increases. In essence, the return on which farmland price is based is becoming a less of a percent of farmland price. Overall, this would be expected to negatively impact farmland prices sometime in the future.

Falling Interest Rates

However, falling interest rates have countered declines in cash rents relative to farmland prices. Falling interest rates tend to support increases in all asset prices – including farmland prices – for two reasons. First, declining interest rates make it easier to finance farmland purchases. As interest rates decrease, loan repayment amounts decrease, thereby increasing the demand for farmland. Second, interest rates represent returns on alternative, fixed income investments to farmland. As interest rates fall, the attractiveness of fixed income investments fall relative to farmland, thereby providing support for farmland prices.

Nominal interest rates have been on a general declining trend since the early 1980s. In 1983, the average interest rate on a 10-year constant maturity Treasury note was 13.91%. From this high, 10-year Treasury note interest rates have declined to a low of 3.26% in 2009 (see Figure 3). Treasury note rates have averaged 3.33% during the first nine months of 2010.

Figure 3. Interest Rate on 10-Year Maturity U.S. Treasury Notes, 1970 - 2010.

Capitalized Values: Quantifying Joint Impacts of Cash Rents and Interest Rates

Capitalized values are used to quantify impacts of both cash rent and interest rate changes on land values. A capitalized value represents the estimated discounted value of all future cash flows to farmland. For an asset with an infinite life, the capitalized value equals the cash rent divided by the interest rate:

Capitalized value = cash rent / interest rate on 10-year note
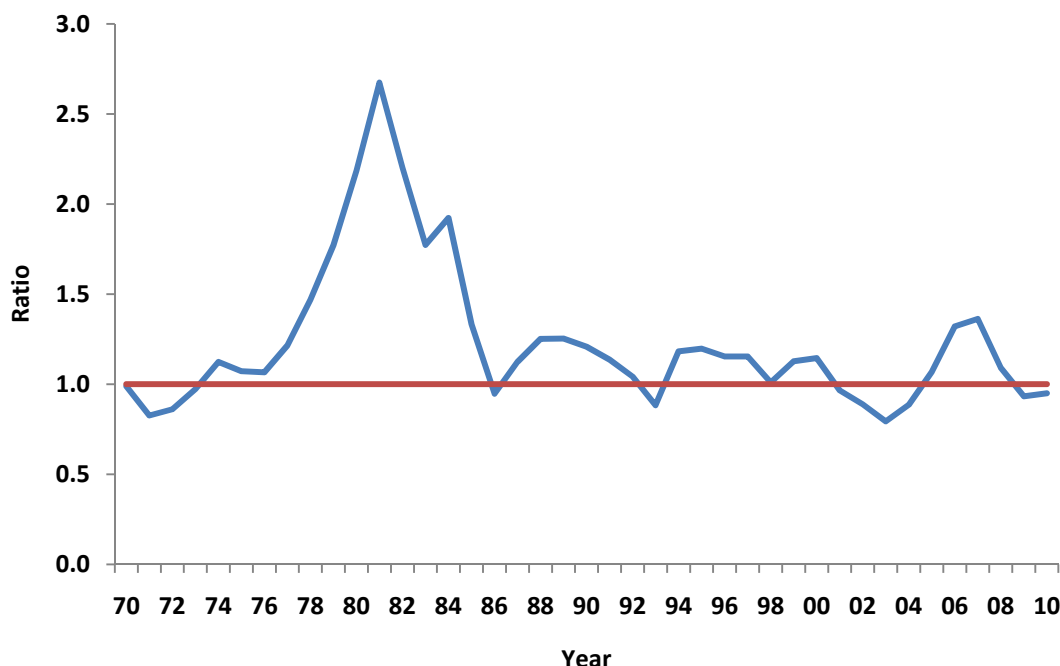
This formula assumes that the cash rent and interest rate remains the same throughout the future. Increases in cash rents and decreases in interest rates will increase capitalized values.

Capitalized values were calculated for each year between 1970 and 2010. These capitalized values then were compared to land prices by calculating price-to-value ratios. A price-to-value ratio equals land price divided by capitalized value. A price-to-value ratio equal to 1 indicates that land price equals capitalized value. Price-to-value ratios above one mean the land prices exceed capitalized values. Land prices may come under pressure to fall if price-to-value ratios become high, indicating that fundamental factors are not supporting land prices.

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The calculation of price-to-value ratios are illustrated for 2010 (see Appendix Table 1 for all capitalized values). In 2010, cash rent was $169 per acre and the 10-year Treasury note rate was 3.33%, giving a capitalized value of $5,075 per acre ($169/.0333). In 2010, the average Illinois price was $4,820, giving a 2010 price-to-value ratio is .95 ($4,820 land price / $5,075 capitalized value). This means that land price is 95% of capitalized value.

The 2010 price-to-value ratio can best be interpreted relative to its historical levels (see Figure 4). Between 1970 through 2010, the highest price-to-land price ratios occurred during the 1980s. Price-to-value ratios were 2.19 in 1980, 2.67 in 1981, and 2.20 in 1982. This was the period immediately before the dramatic fall in land prices during the 1980s. Between 1980 and 1982, the high price-to-value ratio indicated that land prices were not supported by fundamental economic factors such as farmland returns or interest rates.

Figure 4. Land Price Divided by Capitalized Value, Illinois, 1970 - 2010.

Between 1990 and 2010, the price-to-value ratio averaged 1.07, indicating that farmland prices were reasonably in line with cash rents and interest rates. Since 1990, the highest price-to-value ratios occurred in 2006 and 2007, the period immediately after land prices increased due to urban development pressures. Price-to-value ratios were 1.32 in 2006 and 1.36 in 2007. At this point, there was some concern that farmland prices were above those supported by cash rents and interest rates. In 2008, cash rents increased bringing capitalized values to line with prices. The 2010 price-to-value ratio of .95 indicates that price is in the proper relationship to current cash rent and interest rate.

Importance of Interest Rate Declines on Land Value Increases

A great deal of focus is deservedly given to cash rents and farmland returns when examining the outlook for farmland prices. This focus, however, may ignore the importance that interest rate declines have played in increasing farmland prices. Capitalized values indicate that land prices would be much lower had not interest rates declined.

To illustrate, capitalized values are compared for 1990 and 2010. The capitalized value was $1,163 per acre in 1990 and $5,073 per acre in 2010. The 1990 capitalized value, based on a $99 per acre cash rent and an 8.55% Treasury rate, is $1,163 per acre ($99 / .0855). The 2010 capitalized value, based on a $169 per acre cash rent and a 3.33% interest rate, is $5,075 per acre ($169 / .0333). Suppose that interest rates did not decline between 1990 and 2010. Then the 2010 capitalized value would be based on the 1990 rate of 8.55%, giving a capitalized value of $1,976 ($169 / .0855). Had not interest rates declined, the 2010 capitalized value would be over $3,098 per acre lower than its current value ($3098 difference = $5,075 capitalized value in 2010 - $1,977 capitalized value using an 8.55% rate).

Farmland Price Outlook

Current farmland prices are in line with cash rent and interest rate levels. Hence, farmland prices in the future will be impacted by changes in farmland returns and interest rates rather than by adjustments back to fundamental relationship indicated by cash rents or interest rates.

At this point, farmland returns and cash rents appear to be under no downward pressure over the next several years. In fact, recent commodity price increases likely will cause cash rents to increase. These rental increases may support farmland price increases over the next several years. Farmland price increases in the 3% range over the next year would cause prices to still be in line with capitalized values.

Corn and soybean prices will decline in the future from their current levels of over $5.00 per bushel for corn and over $11.00 per bushel for soybeans. Price declines could occur because of yields near or above average leading to building of stocks. Moreover, other factors – such as changes in demand and changes in government policy – could lead to lower commodity prices. Like in the past, farmland returns will be variable and will experience low periods in the futures. However, the long-run return outlook for crop production generally is favorable due to increasing use of commodities in developing countries.

In my opinion, the longer run risk for a large farmland prices decrease comes more from interest rate increases than from farmland return declines. At this point, further interest rate declines seem unlikely because interest rates already are at very low levels compared to historical averages. Moreover, there does not appear to be any upward pressures on interest rates currently. The Federal Reserve has indicated that it will continue policies, such as quantitative easing, that keep interest rates low. Sometime in the future, though, the Federal Reserve will have to end expansionary monetary policies and enter a period of tightening. At this point, interest rates could increase.

Two notes on interest rate increases. First, it will not take much of an increase in interest rates to put downward pressure on land prices. For example, the 2010 capitalized value is $5,075, based on a $169 per acre cash rent and a 3.33% Treasury note rate. An 1% increase in interest rate to 4.33% reduces capitalized value to $4,112, a decrease of $961 per acre. From a historical standpoint, a 4.33% rate on a Treasury note is still not a high interest rate. Hence, even modest interest rates more towards historical average levels could lead to downward pressure on farmland prices.

Second, when interest rates rise, they may do so quickly. For example, interest rates increased 4.47% in a two-year period from 1979 to 1981. This suggests that when downward pressure does come from interest rate increases, that pressure may come in dramatic fashion.

Summary

Currently, farmland prices in Illinois are in line with historical relationships suggested by capitalized values. These capitalized values take into consideration cash rent and interest rate levels. The rise in commodity prices experienced this summer and fall likely will lead to upward pressure on cash rents, thereby leading to higher farmland prices.

There are always concerns about farmland price declines. At this point, interest rate increases could lead to downward pressure on farmland prices.

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Appendix Table 1. Illinois Cash Rents and Land Prices, 10-Year Treasury Note Rates, and Land Return Measures.

Year	Cash Rent[1]	Land Price[1]	Rent Divided by Price	10 year Treasury Note[2]	Capitalized Value[3]	Land Price Divided by Cap. Value
	$ per acre	$ per acre			$ per acre	
1976	76	1,062	7.14%	7.61%	996	1.07
1977	89	1,458	6.10%	7.42%	1,200	1.22
1978	93	1,625	5.72%	8.41%	1,106	1.47
1979	99	1,858	5.33%	9.44%	1,048	1.77
1980	107	2,041	5.24%	11.46%	934	2.19
1981	114	2,188	5.20%	13.91%	818	2.67
1982	119	2,023	5.90%	13.00%	918	2.20
1983	116	1,857	6.26%	11.11%	1,047	1.77
1984	119	1,845	6.47%	12.44%	959	1.92
1985	110	1,381	7.97%	10.62%	1,036	1.33
1986	100	1,232	8.11%	7.68%	1,300	0.95
1987	86	1,149	7.46%	8.38%	1,022	1.12
1988	89	1,262	7.07%	8.85%	1,008	1.25
1989	94	1,391	6.78%	8.50%	1,110	1.25
1990	99	1,405	7.07%	8.55%	1,163	1.21
1991	101	1,459	6.92%	7.86%	1,284	1.14
1992	103	1,536	6.73%	7.01%	1,474	1.04
1993	103	1,548	6.65%	5.87%	1,752	0.88
1994	100	1,670	5.99%	7.08%	1,412	1.18
1995	100	1,820	5.49%	6.58%	1,520	1.20
1996	106	1,900	5.58%	6.44%	1,646	1.15
1997	109	1,980	5.51%	6.35%	1,716	1.15
1998	111	2,130	5.21%	5.26%	2,109	1.01
1999	111	2,220	5.00%	5.64%	1,969	1.13
2000	119	2,260	5.27%	6.03%	1,974	1.15
2001	119	2,290	5.20%	5.02%	2,372	0.97
2002	122	2,350	5.19%	4.61%	2,646	0.89
2003	123	2,430	5.06%	4.02%	3,064	0.79
2004	126	2,610	4.83%	4.27%	2,948	0.89
2005	129	3,210	4.02%	4.29%	3,007	1.07
2006	132	3,640	3.63%	4.79%	2,755	1.32
2007	141	4,150	3.40%	4.63%	3,046	1.36
2008	163	4,850	3.36%	3.67%	4,445	1.09
2009	163	4,670	3.49%	3.26%	5,005	0.93
2010	169	4,820	3.51%	3.33%	5,073	0.95

[1] Data from N.A.S.S., U.S.D.A., *Land Values and Cash Rent.* Various issues. The Economic Research Service calculated cash rents prior to 1987. There may have been a change in methodology that caused changes in cash rents between 1986 and 1987 not totally due to rent changes.

[2] Data from St. Louis Fed website. Series is 10-year Treasury constant maturity monthly series (GS10). The 2010 rate is an average of rates through September.

[3] Equals cash rent divided by Treasury note rate.