ABSTRACT

Both farmland values and rental rates have seen significant increases over the past few crop years. The increase in land values, in particular, has members of the agricultural and outside investment communities concerned over the potential for a significant decline in land values and the resulting impacts on the profitability and viability of farm operations. This uses data on land values, rental rates, crop revenues, and interest rates in Illinois from various sources to analyze historical relationships among these factors. The data suggest that current land values are supported by both commodity and interest rate market fundamentals. However, uncertainty over future commodity prices and interest rates results in a wide range for potential land values in both the short- and long-terms. Farm operators, landowners, professional farm managers, and investors need to be aware of and carefully consider these factors in valuation farmland and setting appropriate rental rates and contract designs.

Farmland Value and Rental Rate Behavior in Illinois

By Nick Paulson & Gary Schnitkey

Introduction

Farmland values and rental rates in major corn belt states experienced significant increases once again in 2013. According to data from the USDA, the average value of farmland in Illinois increased by 16.4 percent to $7,800 per acre from 2012 to 2013. This is the third straight year of land value increases exceeding 15 percent in Illinois. Average cash rental rates have also continued to rise, increasing by 5.2 percent in 2013 following 8.3 and 15.8 percent increases in 2011 and 2012, respectively. With the longer term outlook for corn and soybean prices to fall below levels experienced in recent years, and uncertainty surrounding monetary policy and interest rates, the future path of land values and rental rates continues to be of primary concern to farmland owners, farm operators, and the investment community.

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Another farmland trend in the Midwest is the shift in type of rental arrangements being used among landowners and tenants. Fixed cash rental agreements have become the dominant type of contract, with a decline in the use of traditional crop share arrangements. Flexible or hybrid leases, which may contain both fixed and share components, are also becoming more popular in certain regions but still represent a relatively small percentage of farmland leases (Paulson, 2012). These trends have important implications for the sharing of risk among landowners and their farm operator tenants.

In this paper, we discuss recent trends in land values, rental rates, and rental agreements in the Midwest using data for Illinois from a variety of sources as the specific example. These trends include increasing land values and rental rates and a continued shift in rental agreement type towards fixed cash rent. We then compare the increase in land values and rental rates with current interest rate levels and examine the historical relationship between rental rates and crop revenues. We also examine the historical relationships between landowner returns on fixed cash rent and traditional crop share arrangements. Finally, we briefly discuss the resulting implications for farmland owners, farm operators, and professional farm managers.

Land Values and Rental Rates

The 2013 land values report from the USDA listed the average value of Illinois farmland at $7,800 per acre, an increase of 16.4 percent from the average value of $6,700 per acre in 2012. Figure 1 plots the annual percentage change in Illinois farm land values from 1977 to 2013. Illinois land values have increased at an average annualized rate of 12.4 percent over the past decade, more than tripling in value since 2003. This represents a more than doubling in the average annual growth rate of 4.8 percent experienced from 1987 to 2003.

While the more recent growth in land values represents a significant increase from the growth experienced during the 15 year period following the farm crisis of the 1980s, it is not as large – in relative terms – as the period preceding the crisis. Over the five year period from 1976 to 1981, average nominal farmland values in Illinois more than doubled, growing at an average annual rate of 15.5 percent.

Still, the increased growth in land values has created concerns over the potential for a significant decline similar to what was experienced during the 1980s farm crisis. However, in contrast to conditions leading up to and during that period, market fundamentals seem to provide support for the current level of farmland prices.

Figure 2 plots the average farmland value in Illinois from 1976 through 2013, both in nominal and real terms. Real farmland values are given in 2005 dollars and were computed using the producer price index (PPI) for farm products provided by the Bureau of Labor Statistics (BLS). Since 2003, IL land values have increased at average rate of 6.2 percent per year in real terms, compared to an average real growth rate of 3.8 percent per year from 1987 to 2003. Real annual growth in IL land values averaged 9.1 percent per year from 1976 to 1981.

Also included in Figure 2 is an estimated capitalized value of farmland. This capitalized value is taken as the average cash rental rate for cropland reported by USDA divided by the 10-year constant maturity US Treasury Note rate from the Federal Reserve (FRED, 2013). From 1987 to 2011, land values have mirrored capitalized values quite closely. In contrast, land values increased to more than double their implied capitalized values in the early 80s when the 10-year CMT rate ranged from 6 to 8 percent. Since 2009, average land values have been below capitalized values, suggesting land values are below that which would be implied by interest rates which line up with implied capitalization rates used by the market over the past 25 years.

The 10-year CMT is currently at historically low levels, falling to an average of 1.8 percent in 2012 and ranging around two percent thus far in 2013. Declining interest rates have certainly contributed to a portion of the increase in land values experienced over the past six crop years. The average farmland value in Illinois of $7,800 in 2013 is well below the capitalized value of $10,825 implied by the 2.06 percent 10-year CMT rate and the average rental rate of $223 per acre. A portion of this large disparity is likely explained by uncertainty surrounding the Fed's monetary policy, its impact on interest rates, and the resulting expectations for interest rates in the short and moderate-terms.

Rental Rates and Crop Revenues

The previous section compared average Illinois land values to capitalized values implied by current cash rent levels and interest rates. The appropriateness of the capitalized values relies on the soundness of the income generating measure associated with the asset – in this case the average cash rental rate for farmland in Illinois. Economic theory suggests that rental rates accrue as the residual return to landowners, and thus should be closely linked to the potential income which could be generated by the asset in its best use.

While low interest rates are no doubt a contributor to the current level of farm land values, rental rates have also been increasing, particularly since 2006. The average annual growth in farmland rental rates since 2003 is 6.1 percent. Annual growth since 2006 has been 7.8 percent, with more than 15 percent annual increases occurring from 2007 to 2008, and again from 2011 to 2012. Commodity prices have also seen significant increases over these time periods. Figure 3 illustrates the historical relationship between the average cash rental rates reported by the USDA and crop revenue levels. Crop revenues are calculated for a 50-50 corn-soybean rotation using actual Illinois yields and marketing year average prices received as reported by USDA-NASS.

From 1976 to 2005, cash rent levels averaged 40 percent of crop revenues. From 2006 through 2012 this average fell to 28 percent. These figures suggest that revenue levels have increased at a faster rate than cash rent levels in Illinois. Thus, cash rent levels have not increased beyond what would be considered historically reasonable levels relative to crop revenues.

Average cash rent data from the Illinois Society of Professional Farm Managers and Rural Appraisers

(ISPFMRA) tells a slightly different story. The rents reported in the ISPFMRA annual report reflect recently negotiated rental rates. In an environment of increasing rent levels, new negotiations will tend to be above the regional average. The relationship between newly negotiated rates and revenue levels is closer to what has been experienced historically, averaging 42 percent since 2006.

Potential Impact of Interest Rates and Crop Revenues

Both average and newly negotiated cash rent levels seem to be in line with recent crop revenue levels. However, expectations are for commodity prices to fall below current levels in the longer-term. If this occurs, many newly negotiated rents may need to be revisited, and rental agreements closer to the current regional averages will be more in line with historical levels relative to crop revenues.

Table 1 outlines three expected revenue and cash rental rate scenarios to consider over the next five years. The latest long-term projections from the USDA show an average corn price of $4.50 and an average soybean price of around $10.80 over the 2014 to 2018 timeframe. Under a 50-50 rotation, this would resulting in expected revenues of $653 per acre. Applying the historical relationship of average cash rental rates ranging from 30 to 40 percent of crop revenues implies an average cash rental rate of $228 per acre in Illinois, just slightly above the current average of $223 per acre reported for 2013. Two additional scenarios are also outlined in Table 1. The low price scenario considers corn and soybean price levels 20 percent below the USDA projections, while the high price scenario considers corn and soybean prices 20 percent above projections at levels similar to those experienced over the past few crop years.

For the low price scenario, expected crop revenues would be $522 per acre for a 50-50 corn-soybean rotation, with average cash rents projected at $183 per acre. Using a two percent capitalization rate, this rental rate would imply average land values at $9,135 per acre. Implied land values would fall to $6,090 at a three percent capitalization rate, and $4,568 at a four percent capitalization rate.

The scenario with prices at the level of USDA projections would imply an average Illinois cash rent of $228 per acre, just $5 per acre above the current average for 2013. Implied land values would range from $11,419 at a two percent capitalization rate to $5,709 per acre at a four percent capitalization rate. At a three percent capitalization rate, the implied land value would be $7,613 per acre which is very close to the average land value of $7,800 per acre reported for Illinois in 2013. Finally, the high price scenario implies average cash rents at $274 per acre in Illinois. In this scenario, capitalized land values range from over $13,700 per acre at the two percent rate to $6,851 per acre at the four percent rate.

Both the implied rental rates and capitalized land values are quite sensitive to the various corn and soybean price levels considered. Land values fall within a more than $4,500 range at the two percent capitalization rate, while the range from the low to high price scenario is nearly $2,300 per acre at the four percent capitalization rate.

Land values are even more sensitive to the assumed capitalization rate. Thus, a rise in interest rates may be the more likely factor which could negatively impact land values in the short term. This is particularly true when considering relatively low capitalization rates. With interest rates at historically low levels, even small absolute changes result in large relative swings. For example, a 100 basis point increase when rates are at two percent represents a 50 percent increase, whereas the same basis point increase when rates are at five percent represents only a 20 percent rate increase. The resulting impact on capitalized values also displays the same type of sensitivity.

Figure 4 plots capitalized land values for each price scenario across a range of capitalization rates. As the figure illustrates, land values become more highly sensitive to changes in the capitalization rate as they become lower, while the sensitivity is reduced significantly as the capitalization rate approaches and exceeds the four to five percent range.

Given that interest rates are at historically low levels, the most likely future direction of rates is likely for them to be stable or to begin increasing. Uncertainty surrounding the short- and longer-term path of interest rates likely explains a portion of the departure from the historical relationship between the 10-year CMT rate and Illinois land values over the past few crop years illustrated in Figure 2. The average land value and cash rental rates of $7,800 and $223 per acre, respectively, in 2013 imply a capitalization rate of approximately 2.8 percent. This includes a fairly significant risk premium above the current 10-year CMT rate which has averaged just over two percent thus far in 2013.

Cash and Share Rental Rates

Over the past decade, rental agreement types have been trending away from traditional share rental arrangements to fixed cash rent. This is true throughout the Midwest region, but has been most pronounced in Illinois. While ownership rates have remained relatively constant, the proportion of acreage rented under fixed cash rent agreements has increased while share rental acreage has declined (Schnitkey, 2013b).

The move towards more cash rent agreements shifts a greater share of return risk exposure to the farm operator tenant. Furthermore, the increased exposure to both price and yield risk under a cash rent agreement can only be partially offset by purchasing crop insurance at available coverage levels (Paulson, Sherrick, and Schnitkey, 2010).

Economic theory would suggest that the increased risk exposure for the tenant under a cash rent agreement would imply greater expected returns for the tenant as risk premium. Figure 5 illustrates this effect over time by plotting the average cash rental rate in Illinois along with a "Share Rent Equivalent" measure calculated from the Illinois Farm Business Farm Management Association (FBFM, 2013). The equivalent measure is based on an average landlord rate received if the land were operated under a traditional 50-50 share rent agreement.

Note that the share rent equivalent measures is more volatile, illustrating the additional risk involved for the landlord under a share rent contract. From 1987 through 2005, the share rent equivalent measure was at a fairly stable premium above the average cash rent level. Figure 6 plots the equivalent share rent premium (share rent equivalent less average cash rent) over time. The premium averaged roughly $25 per acre from 1987 through 2006. Since 2006, the premium relative to the average cash rental rate in Illinois increased to more than $120 per acre.

Also included in Figure 5 are average cash rental rates reported in an annual survey conducted by the Illinois Society of Professional Farm Managers and Rural Appraisers dating back to 2007 (ISPFMRA, 2013). The rental rates are based on recently negotiated leases and, particularly in an environment of increasing rental rates, will generally be above the region wide average reported by the USDA which includes older leases in addition to new negotiations. The ISPFMRA cash rent averages closely mirror the equivalent share rent measures over the 2007 to 2012 crop years. This is an indication that the risk premium gap between share rent contracts and newly negotiated leases is much closer to zero than for older leases. Again, this would be the case in an increasing rental rate environment. If rental rates begin to stabilize or decline, potentially due to lower price expectations, we could see a reversal in the premium with negotiated cash rental rates being above their respective share rent equivalent measures.

Discussion and Conclusions

Both farm land values and rental rates continued to rise in 2013. In Illinois, land values increased by more than 15 percent for the third straight year, while the average rental rate increase by more than five percent. The rate at which land values has been increasing has caused some concern over the potential for a significant decline in land values in the future.

However, land values seem to be in line with both earnings potential – as measured by the average cash rental rate – and the market for interest rates – as measured by the 10-year CMT rate. The increasing crop revenues over the past seven crop years and, even more so, the low level of interest rates differ considerably from the market conditions preceding the 1980s farm crisis. In fact, despite their rapid increase, the average land value in Illinois is currently below the implied value using the 10-year CMT as the capitalization rate.

The capitalized value is also dependent on the accuracy of the earnings measure used, which in this case is the average cash rental rate for Illinois farmland. Analysis of the historical data indicates that cash rental rates are also in line with crop revenues. The average rental rate is actually well below levels which would be implied by the historical relationship between rental rates and revenue levels. Newly negotiated leases, reported by the ISPFMRA in their annual survey, are much more in line with this historical relationship.

While current land values seem to be supported by both commodity prices and interest rate market fundamentals, capitalized values are very sensitive to both. With the longer-term projections for commodity prices to decline from current levels, a decline in land values of up to 20 percent is possible. Future land values could be even more sensitive to changes in interest rates given the historically low rate environment. Even small changes in interest rates – in absolute terms – from their current levels could have a large relative effect on land values. This differs from an environment of higher interest rates where similar absolute changes would have smaller relative effects.

Finally, the trend away from share rental arrangements towards fixed cash rent contracts has continued throughout the Midwest, shifting more risk exposure to tenant operators. While there is evidence of a risk premium when comparing average cash rental rates to equivalent share rent measures historically, newly negotiated cash rental rates reported by the ISPFMRA suggest that this premium is converging toward zero. Cash rental rates are being bid up closer to the expected share rent return level so that tenants are taking on more risk for the same expected return. Access to a broader variety of risk management tools such as crop insurance and more advanced marketing strategies may be facilitating this shift, but it is difficult to fully offset the increased risk exposure from moving to a fixed cash rent contract.

With the future for both commodity prices and interest rates remaining relatively uncertain, landowners, tenants, and professional farm managers need to carefully consider these issues. The valuation of farmland in today's market requires careful consideration over expectations for the direction of interest rates, and appropriately building in an appropriate risk premium into the capitalization rate when making those valuations. Bidding on land through cash rental agreements should be done cautiously, especially for contracts covering multiple years. Share and, increasingly, flexible cash or hybrid leases remain attractive alternatives to manage risk, but might require the tenant to be willing to negotiate a higher rate, in expectation, by adjusting sharing rates for both revenues and, if applicable, production costs.

References

BLS. 2013. Producer Price Indexes, Bureau of Labor Statistics. http://www.bls.gov/ppi.

FBFM. 2013. Size-Type Standards, selected years. Illinois Farm Business Farm Management.

FRED. 2013. Federal Reserve Economic Data, Federal Reserve Bank of St. Louis. http://research.stlouisfed.org/fred2/series/DGS10.

ISPFMRA. 2013. "2013 Illinois Farmland Values & Lease Trends." Illinois Society of Professional Farm Managers and Rural Appraisers, Bloomington, IL.

Paulson, N.D. 2012. "Revisiting Flexible Cash Leases." *Journal of the American Society of Farm Managers and Rural Appraisers* 75(1): 165-177.

Paulson, N.D., G.D. Schnitkey, and B.J. Sherrick. 2010. "Rental Arrangements and Risk Mitigation of Crop Insurance and Marketing: Impacts in the Corn Belt." *Agricultural Finance Review* 70(3): 399-413.

Schnitkey, G. 2013a. "Farmland Prices and Interest Rates." http://farmdocdaily.illinois.edu/2013/05/farmland-prices-interest-rates.html.

Schnitkey, G. 2013b. "Farmland Ownership and Rental Percentages in Illinois: A 2007 to 2012 Perspective." http://farmdocdaily.illinois.edu/2013/07/farmland-ownership-rental-illinois-2007-2012.html.

USDA. 2013a. "Land Values Summary (various years)." National Agricultural Statistics Service, United States Department of Agriculture, Washington D.C.

USDA. 2013b. Cash Rents Summary (various years). National Agricultural Statistics Service, United States Department of Agriculture, Washington D.C.

Westcott, P. and R. Trostle. 2013. USDA Agricultural Projections to 2022. Outlook No. OCE-131, February 2013. Economic Research Service, USDA, Washington DC. Available at http://www.ers.usda.gov/media/1013562/oce131.pdf.

Table 1. Price, Revenue, and Cash Rent Level Scenarios

	Low Price	USDA Outlook	High Price
Corn Price ($/bu)	$3.60	$4.50	$5.40
Soybean Price ($/bu)	$8.64	$10.80	$12.96
Expected Revenue ($/acre) (50/50 Rotation)	$522	$653	$783
Cash Rent ($/acre) (35% of Expected Revenue)	$183	$228	$274
Land Value ($/acre) (2% Capitalization Rate)	$9,135	$11,419	$13,702
Land Value ($/acre) (3% Capitalization Rate)	$6,090	$7,613	$9,135
Land Value ($/acre) (4% Capitalization Rate)	$4,568	$5,709	$6,851

Figure 1. Annual Percentage Change in Illinois Farmland Values, 1977 to 2013

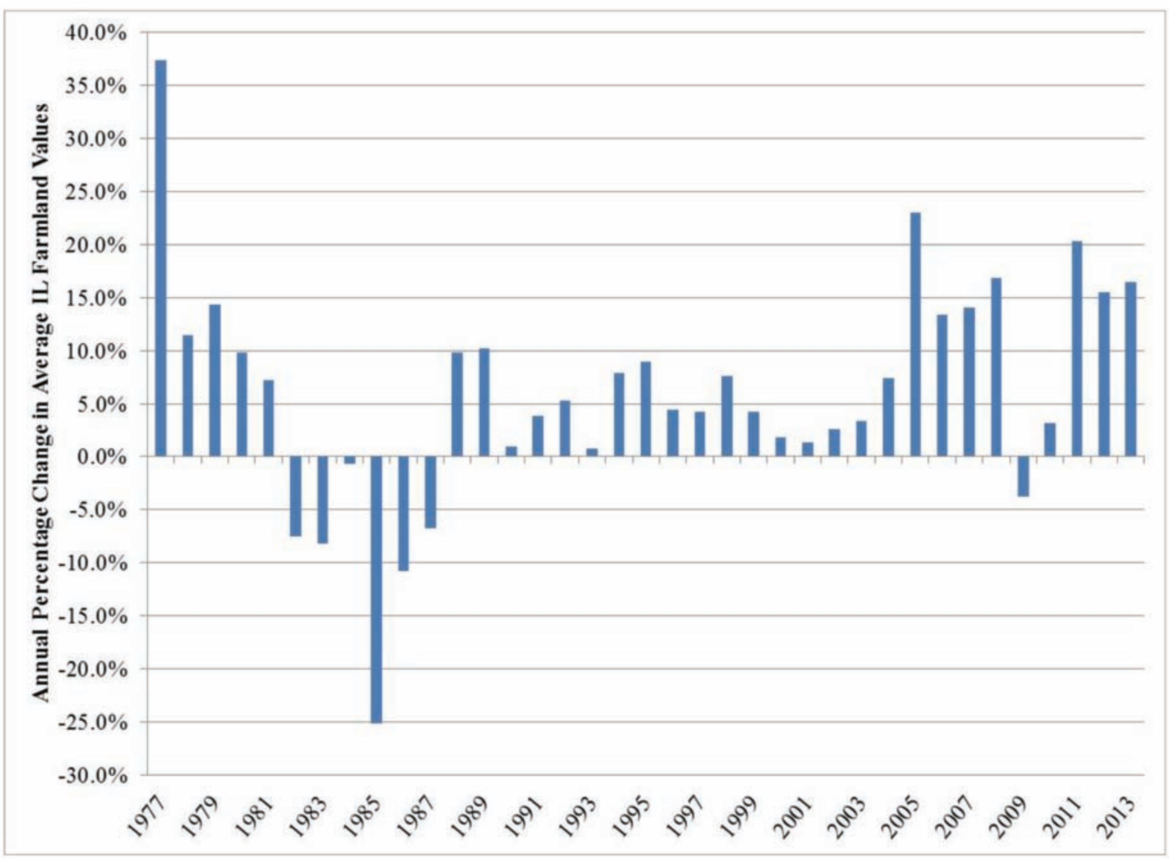

Figure 2. Nominal, Real, and Capitalized Farmland Values in Illinois, 1976 to 2013

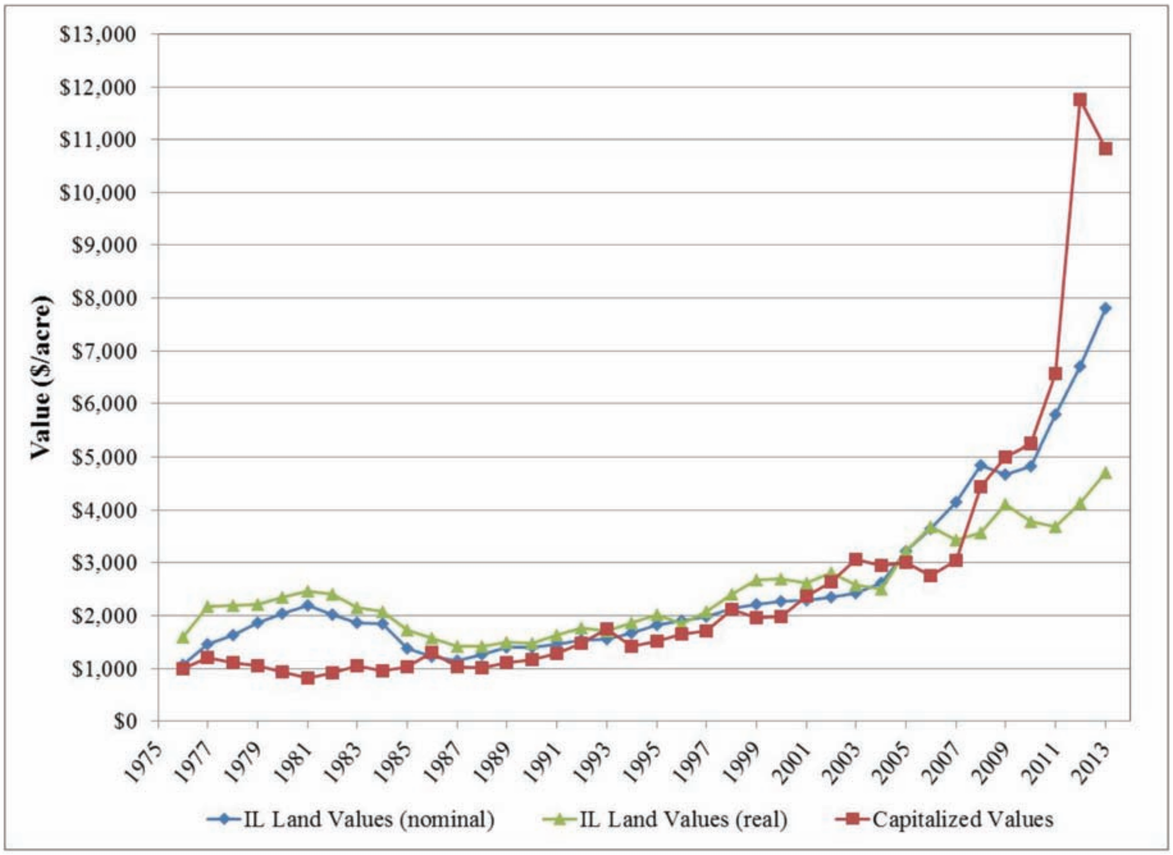

Figure 3. Ratio of Average Cash Rent to Crop Revenues, 1976 to 2012

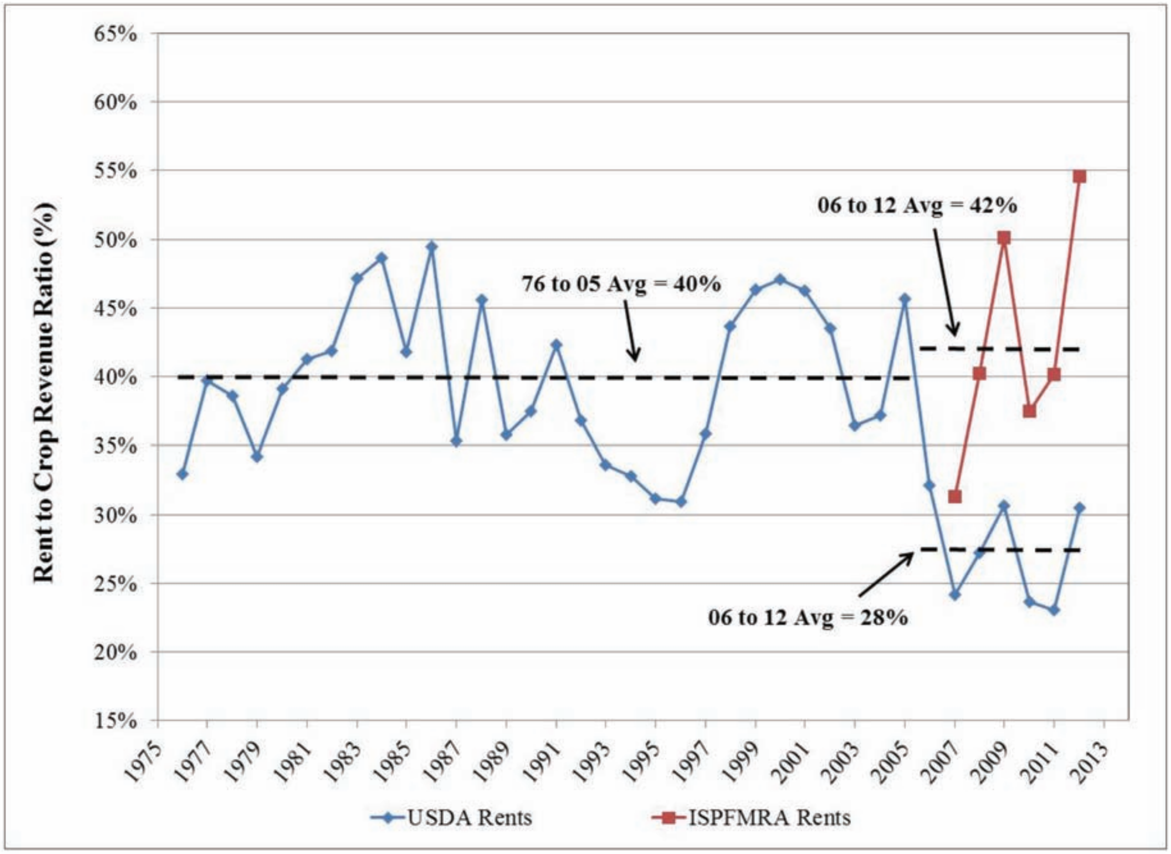

Figure 4. Capitalized Land Values at Various Rental Income and Capitalization Rate Levels

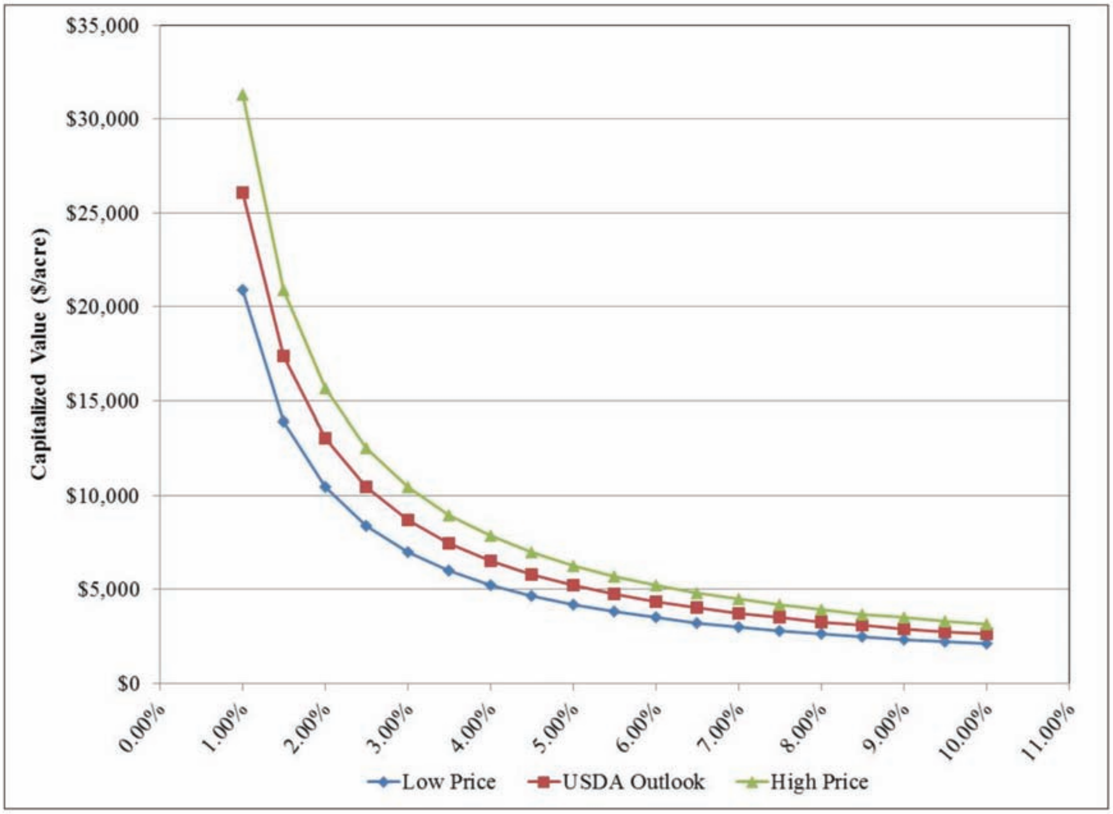

Figure 5. Rental Rate Measures in Illinois, 1987 to 2012

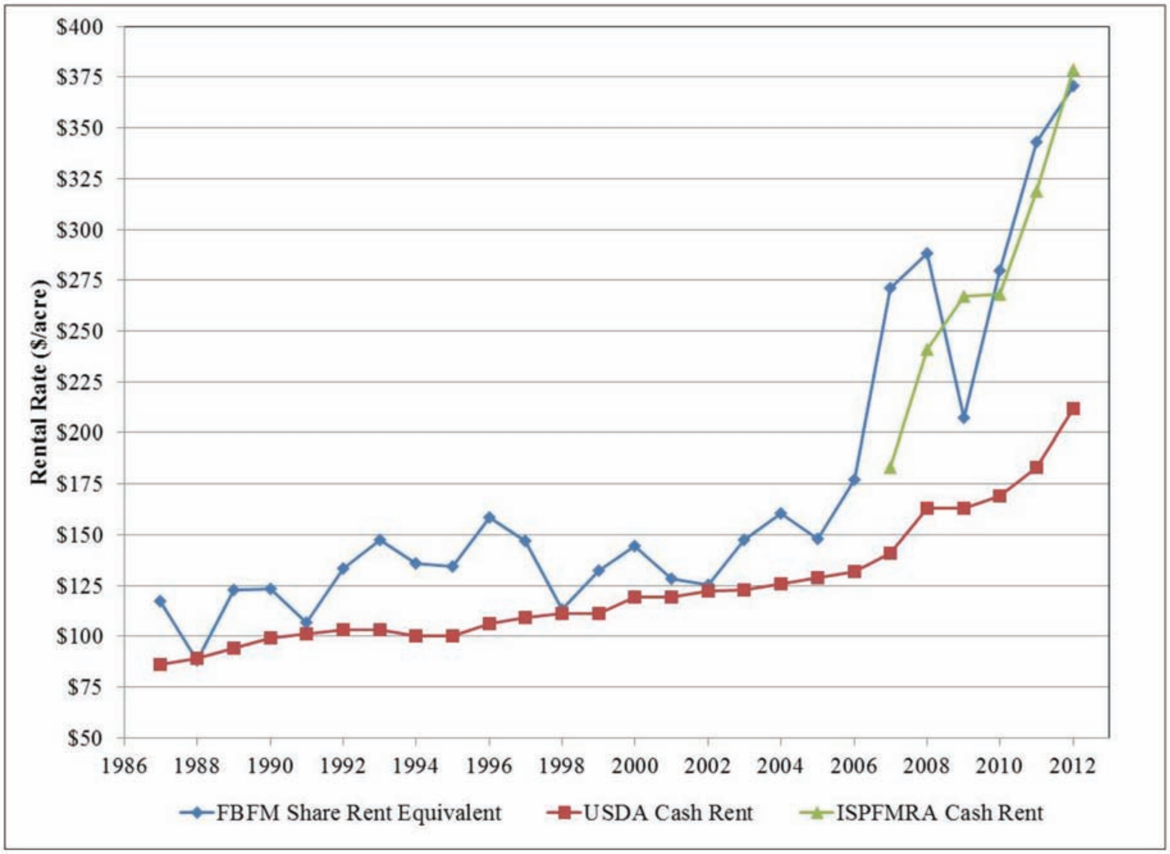

Figure 6. Equivalent Share Rent Premium Levels in Illinois, 1987 to 2012