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PURDUE AGRICULTURAL ECONOMICS REPORT

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Indiana Farmland Values & Cash Rents Issue

Contents:

Indiana Farmland Prices Continue to Rise in 2023

Todd H. Kuethe, Schrader Endowed Chair in Farmland Economics

Indiana farmland prices once again hit a new record high in 2023, according to the recent Purdue Farmland Value and Cash Rent Survey. Statewide, the average price of top quality farmland is $13,739 per acre, up 7.3% from June 2022 (Table 1). Average and poor quality farmland also hit new highs at $11,210 and $8,689 per acre, with an annual increase of 5.8% and 0.7%, respectively. While farmland prices reached a new peak in 2023, the appreciation rate from 2022 to 2023 was much lower than the record high price growth observed between 2021 and 2022.

State-level averages, however, mask the variability in farmland price changes across Indiana (Figure 1). In the Southeast region, for example, farmland prices grew by exceptionally high levels across all three quality grades (36.8%, 45.4%, and 55.8% for top, average, and poor quality lands), but, in the Southwest region, farmland prices fell across all three quality grades (–7.0%, –7.6%, and –10.5%). The highest land values were once again found in the Central region, with an average per acre price of $14,852 for top, $12,576 for average, and $9,657 for poor quality land.

Respondent expectations for the second half of 2023 also vary across regions and land qualities. Respondents expect modest increase in the Southwest region across all quality grades and for top and average quality land in the Southeast region. However, in the remaining classes in regions the respondents expect modest declines in values through December 2023.

The changes in values for farmland transitioning out of agricultural production and those of farmland used for recreational purposes also diverged in 2023. Statewide, the per acre value of farmland transitioning out of agricultural production increased by 4.1% between June 2022 and June 2023 to $25,228. However, the value of recreational land declined by –10.4% to $8,170 per acre.

Table 1: Average estimated Indiana land value per acre (tillable, bare land), per bushel of corn yield, and percentage change by geographic area and land class, selected time periods, Purdue Land Value Survey, June 2023[1]

			Land Value						Land Value/bu			Projected Land Value	
									Amount	Amount	% Change	Dec	% Change
	Land	Corn	June 2022	Dec 2022	June 2023	6/22-6/23	6/22-12/22	12/22-6/23	2022	2023	6/22-6/23	2023	6/23-12/23
Area	Class	Bu/A	$/A	$/A	$/A	%	%	%	$	$	%	$	%
North	Top	219	12,635	12,875	13,000	2.9	1.9	1.0	57.65	59.32	2.9	12,582	-3.2
	Average	185	9,596	9,904	10,083	5.1	3.2	1.8	51.87	54.50	5.1	9,679	-4.0
	Poor	154	7,323	7,614	7,468	2.0	4.0	-1.9	47.66	48.61	2.0	7,000	-6.3
Northeast	Top	220	12,878	13,925	13,793	7.1	8.1	-1.0	58.60	62.76	7.1	13,487	-2.2
	Average	191	11,195	11,884	11,583	3.5	6.2	-2.5	58.54	60.56	3.5	11,297	-2.5
	Poor	164	9,418	9,275	8,692	-7.7	-1.5	-6.3	57.54	53.10	-7.7	8,947	2.9
W. Central	Top	227	13,050	13,673	13,965	7.0	4.8	2.1	57.53	61.57	7.0	13,807	-1.1
	Average	198	10,914	11,297	11,490	5.3	3.5	1.7	55.20	58.12	5.3	11,437	-0.5
	Poor	171	9,012	9,033	9,321	3.4	0.2	3.2	52.56	54.36	3.4	8,991	-3.5
Central	Top	219	13,156	14,261	14,852	12.9	8.4	4.1	60.20	67.97	12.9	14,765	-0.6
	Average	195	11,278	12,120	12,576	11.5	7.5	3.8	57.77	64.42	11.5	11,978	-4.8
	Poor	170	9,270	9,736	9,657	4.2	5.0	-0.8	54.60	56.88	4.2	9,770	1.2
Southwest	Top	227	13,825	12,143	12,857	-7.0	-12.2	5.9	61.03	56.75	-7.0	13,179	2.5
	Average	193	10,222	9,179	9,450	-7.6	-10.2	3.0	52.96	48.96	-7.6	9,589	1.5
	Poor	160	8,022	6,982	7,182	-10.5	-13.0	2.9	50.06	44.82	-10.5	7,232	0.7
Southeast	Top	207	8,929	12,167	12,213	36.8	36.3	0.4	43.09	58.93	36.8	12,363	1.2
	Average	184	6,900	9,625	10,031	45.4	39.5	4.2	37.52	54.55	45.4	10,100	0.7
	Poor	159	5,214	8,444	8,125	55.8	62.0	-3.8	32.82	51.14	55.8	8,063	-0.8
Indiana	Top	221	12,808	13,432	13,739	7.3	4.9	2.3	57.92	62.13	7.3	13,637	-0.7
	Average	193	10,598	11,020	11,210	5.8	4.0	1.7	54.97	58.14	5.8	10,977	-2.1
	Poor	165	8,631	8,749	8,689	0.7	1.4	-0.7	52.27	52.63	0.7	8,635	-0.6
	Transition[2]		24,240	23,759	25,228	4.1	-2.0	6.2				25,766	2.1
	Recreation[3]		9,121	7,957	8,170	-10.4	-12.8	2.7				8,189	0.2

[1] The land values contained in this summary represent averages over several different locations and soil types. Determining the value for a specific property requires more information than is contained in this report and should include an evaluation by a professional appraiser.

[2] Transition land is land moving out of production agriculture into other, typically higher value, uses.

[3] Recreation land is land located in rural areas used for hunting and other recreational uses.

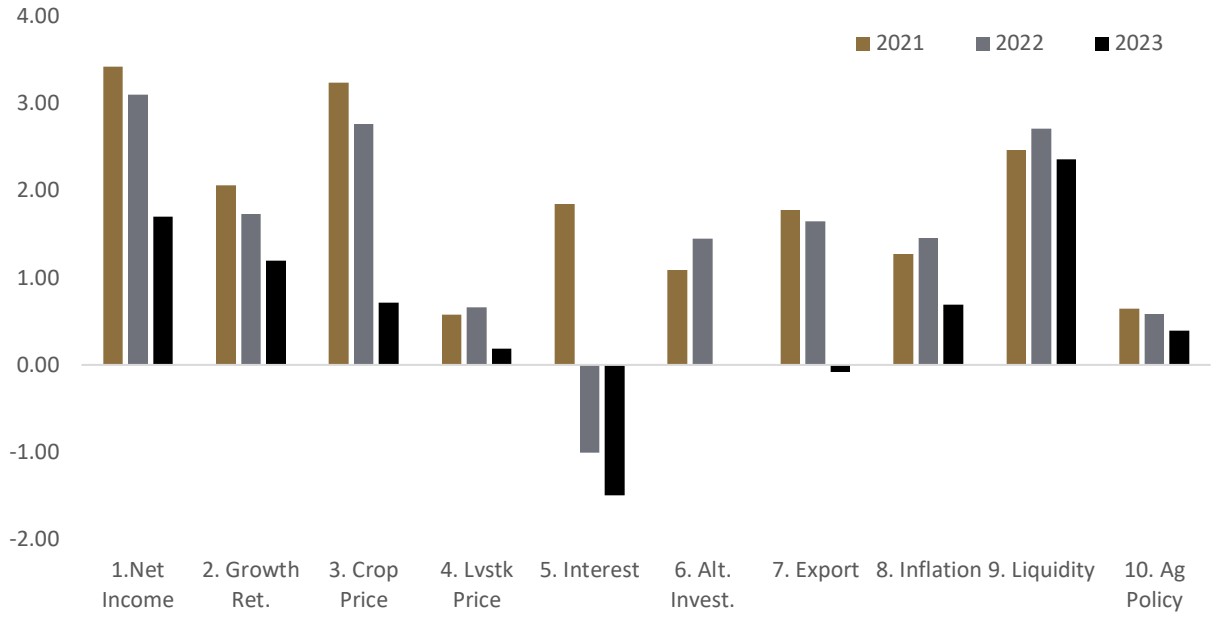
Farmland Market Forces

Respondents were asked to evaluate the importance of ten market forces that may potentially influence the farmland market: (1) current net farm income, (2) expected growth rate in farm returns, (3) crop price level and outlook, (4) livestock price level and outlook, (5) current and expected interest rates, (6) returns to alternative investments, (7) outlook for U.S. agricultural export sales, (8) U.S. inflation rate, (9) cash liquidity of buyers, and (10) current U.S. agricultural policy. Respondents rate each market force on a scale of –5 to +5, with –5 being the strongest negative influence. A positive influence is given a value between 1 and 5, with 5 representing the strongest positive influence. A score of 0 indicates the force was not influential. An average for each item was calculated, and averages for 2021, 2022, and 2023 are included in Figure 2. The horizontal axis shows the item from the list above.

In 2022, the only market force placing downward pressure on land values was interest rates. The 2023 survey suggests even stronger downward pressure, as both short term interest rates and farm mortgage rates increased. Rising interest rates are associated with increased costs of borrowing which puts downward pressure on purchases financed through mortgages. One respondent noted, "the farmland market could be cooling a bit due to higher mortgage rates. Even with a substantial down payment, the higher principal payments eat into cash returns from the additional land." However, another noted that "higher interest rates have not seemed to affect the farmland market at all yet because of farmers' strong cash position." As can be seen in Figure 2, farm sector liquidity is still placing upward pressure on land prices but to a lesser degree than in 2022. The positive influence of a number of other factors, such as commodity prices and inflation, has also subsided in 2023. These declines likely inform the muted expectations for farmland prices in the remainder of 2023. The only other factor placing downward pressure on farmland prices is agricultural exports, yet the respondents report a very small level of influence compared to prior years.

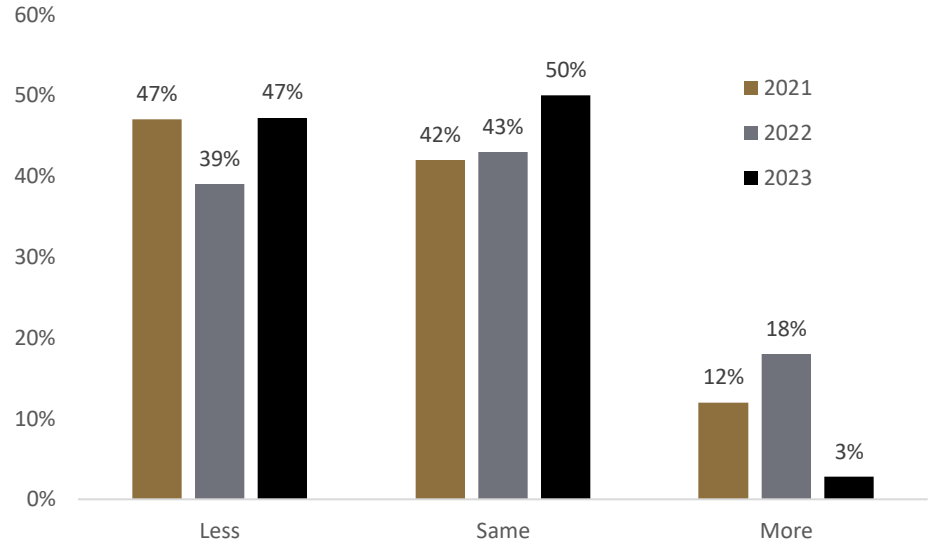
Figure 1: County clusters used in Purdue Land Values survey to create geographic regions

Figure 2: Influence of drivers of Indiana farmland values



Half of all respondents observed the amount of farmland for sale in 2023 was more or less equal to the amount observed in 2022. However, only 3% report an increase in the amount of land for sale in 2023, which further supports land price appreciation.

Figure 3: Percentage of respondents indicating less, same, or more farmland on the market than in the previous June



Five-Year Forecasts

Respondents were asked to forecast the five-year average corn price, soybean price, mortgage rate, and inflation rate (Table 2). Respondents are slightly less optimistic about commodity prices than they were a year ago. The projected corn and soybean prices fell by $0.10 and $0.03 between the 2022 and 2023 surveys. They also project further increases in interest rates but expect inflation to moderate slightly from the high levels observed in the wake of the COVID-19 pandemic.

Table 2: Projected five-year average corn and soybean prices, mortgage interest, and inflation

	Price ($/bu)		Rate (%)	
Year	Corn	Soybeans	Interest	Inflation
2019	4.15	9.01	5.5	2.4
2020	3.77	9.07	3.9	2.1
2021	4.66	11.15	4.9	3.4
2022	5.65	12.84	6.4	5.8
2023	5.55	12.81	6.8	4.5
Average	4.76	10.98	5.5	3.6

Table 3: Average estimated Indiana cash rent per acre, (tillable, bare land) 2022 and 2023, Purdue Land Value Survey, June 2023

			Rent/Acre		Change	Rent/bu. of corn		Rent as % of June Land Value	
Area	Land Class	Corn Bu/A	2022 $/A	2023 $/A	22-23 %	2022 $/bu	2023 $/bu	2022 %	2023 %
North	Top	219	280	289	3.13	1.24	1.32	2.2	2.2
	Average	185	225	233	3.70	1.22	1.26	2.3	2.3
	Poor	154	179	185	3.10	1.18	1.20	2.4	2.5
Northeast	Top	220	293	291	-0.66	1.36	1.32	2.3	2.1
	Average	191	239	239	-0.13	1.27	1.25	2.1	2.1
	Poor	164	190	191	0.69	1.21	1.17	2.0	2.2
W. Central	Top	227	329	327	-0.56	1.44	1.44	2.5	2.3
	Average	198	289	278	-3.67	1.44	1.41	2.6	2.4
	Poor	171	247	243	-1.74	1.45	1.42	2.7	2.6
Central	Top	219	295	310	5.01	1.39	1.42	2.2	2.1
	Average	195	249	275	10.35	1.34	1.41	2.2	2.2
	Poor	170	211	238	12.95	1.30	1.40	2.3	2.5
Southwest	Top	227	309	296	-4.07	1.31	1.31	2.2	2.3
	Average	193	244	239	-2.22	1.23	1.24	2.4	2.5
	Poor	160	194	173	-10.71	1.19	1.08	2.4	2.4
Southeast	Top	207	225	299	32.78	1.10	1.44	2.5	2.4
	Average	184	179	246	37.22	1.00	1.34	2.6	2.4
	Poor	159	141	208	47.16	1.03	1.31	2.7	2.6
Indiana	Top	221	300	306	1.99	1.36	1.38	2.3	2.2
	Average	193	252	257	2.09	1.32	1.33	2.4	2.3
	Poor	165	207	212	2.50	1.29	1.28	2.4	2.4

Cash Rent

Statewide, cash rents increased by a modest amount between 2022 and 2023. However, in nominal terms, statewide cash rents for all three quality grades are at an all time high. Per acre cash rental rates for top, average, and poor quality land exceed the previous highs set in 2013, 2014, and 2021,

respectively. Indiana per acre cash rent for top quality land increase by 1.99% to $306. Cash rental rates for average and poor quality land increase by 2.09% and 2.50% to $257 and $212, respectively. Again, these modest changes at the state level mask some of the larger variation across land qualities and regions. For example, cash rental rates grew by 32.8% to 47.2% in the Southeast region for top, average, and poor quality land, but cash rental rates fell by –2.2% to –10.7% in the Southwest region. The highest cash rents, across all three quality grades, were observed in the West Central region. Across all regions and quality grades, rent as share of land value (the capitalization rate) held relatively steady between 2022 and 2023.

Looking Ahead

State-wide farmland prices in Indiana once again hit a new record high in 2023. The growth, however, was relatively modest compared to the record high appreciation observed in 2022. The continued growth in farmland prices was supported by a number of factors, such as farm incomes and liquidity. The experience, however, was not shared across all regions or quality grades. For example, farmland prices grew substantially in 2023 across the Southeast region yet fell by a modest degree in the Southwest region. Generally, respondents expect modest declines in the remainder of 2023, but, in the current economic climate, the future direction of farmland prices is difficult to determine, as one respondent notes, “future prices and values are very uncertain right now.”

Purdue Farmland Value and Cash Rent Survey

The Purdue Farmland Value and Cash Rent Survey is conducted each June. The survey is possible through the cooperation and contribution of numerous professionals knowledgable of Indiana’s farmland market. These professionals include farm managers, rural appraisers, land brokers, agricultural loan officers, farmers, and Farm Service Agency (FSA) county office directors. These professionals were selected because their daily work requires they stay well informed about farmland values and cash rents.

These professionals provide an estimate of the market value for bare poor, average, and top quality farmland in December 2020, June 2021, and a forecast for December 2021. To assess productivity of the farmland, respondents provide an estimate of long-term corn yield for top, average, and poor productivity farmland. Respondents also provide a market value estimate for land transitioning out of agriculture and for recreational land.

The data reported here provide general guidelines regarding farmland values and cash rent. To obtain a more precise value of an individual tract, contact a professional appraiser or farm manager that has a good understanding of the local market.

Prior reports are located at: https://purdue.ag/paer_archive

PURDUE AGRICULTURAL ECONOMICS REPORT

Article title:	Trends in Farmland Price to Rent Ratios in Indiana
Author:	Michael Langemeier, Professor of Agricultural Economics
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Farmland prices in west central Indiana increased by 5.3% in 2023, and are now 19.5% above the previous peak in 2014. Compared to the farmland price in 2007, current farmland prices in west central Indiana are 187% higher. Farmland prices are influenced by many factors including net income, the growth in earnings, crop and livestock prices, interest rates, alternative investment returns, inflation, liquidity, and agricultural policy. Cash rent, which is influenced by net return to land, along with interest rates, are often referred to as fundamental factors impacting farmland prices. Concerns are periodically expressed by many investment analysts that farmland prices are higher than justified by the fundamentals. One justification for this concern is that previous research has established the tendency of the farmland market to over-shoot its fundamental value.

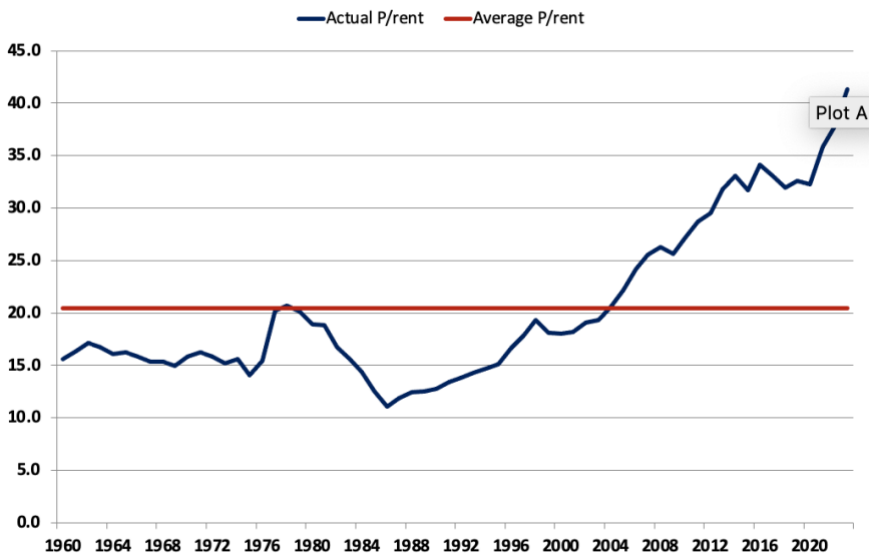
A standard measure of financial performance most commonly used for stocks is the price to earnings ratio (P/E). A high P/E ratio sometimes indicates that investors think an investment has good growth opportunities, relatively safe earnings, a low capitalization rate, or a combination of these factors. However, a high P/E ratio may also indicate that an investment is less attractive because the price has already been bid up to reflect these positive attributes.

This paper computes a ratio equivalent to P/E ratio for farmland, the farmland price to cash rent ratio (P/rent), and discusses trends in the P/rent ratio. We use land value and cash rent data for the 1960 to 2023 period for west central Indiana to illustrate the P/rent ratio. Data from 1975 to 2023 were obtained from the annual *Purdue Land Value and Cash Rent Survey*. For 1960 to 1974, the 1975 Purdue survey numbers were indexed backwards using the percentage change in USDA farmland value and cash rent data for the state of Indiana.

Price to Rent Ratio

The P/rent ratio for west central Indiana averaged 20.5 over the 63-year period from 1960 to 2023 (figure 1). The peak P/rent ratio before 1990 occurred during the 1977 to 1979 period. The P/rent ratio dropped substantially from 1980 to 1986 reaching a low of 11.1 in 1986. The rise from around 15 in 1976 into the 20s and down to 11.1 in 1986 corresponds to what is viewed as the bubble in farmland prices that was followed by one of the most difficult periods in history for production agriculture (i.e., the early-to-mid 1980s).

Figure 1. Farmland Price to Cash Rent Multiple for West Central Indiana, 1960 to 2023.



The P/rent ratio has been above the long-run average since 2004. From 2004 to 2014, the P/rent ratio increased from 20.6 to 33.0. Since 2014, the P/rent ratio has ranged from 31.7 in 2015 to 41.3 in 2023. The current value of 41.3 is relatively high compared to the historic average of 20.5 and a previous high of around 20, and thus at least raises concerns that current farmland prices are overvalued in relationship to returns. Having said that, one of the reasons often mentioned as a major explanatory factor associated with the recently high P/rent ratio is low interest rates. The average interest rate on 10-year treasuries from 1960 to 2023 was 6.0%. The interest rate on 10-year treasuries has been below its long-run average since 2001. Moreover, the rate has not been above 4% since 2008. It is important to note, however, that after averaging 2.95% in 2022, the 10-year treasury rate has been increasing, reaching a level of 3.75% in June. Over the 63-year period from 1960 to 2023, the P/E ratio for stocks is 19.6, which is similar to the long-run average P/rent ratio. Though the long-run averages are similar, the P/E and P/rent ratios do not necessarily track one another. The average correlation coefficient between these two measures is only 0.29. Though not the topic of this paper, diversification potential between the stock market and farmland is relatively high.

Cyclically Adjusted P/Rent

Shiller (2005; 2023) uses a 10-year moving average for earnings in the P/E ratio, often labeled either P/E10 or cyclically adjusted P/E (CAPE), to remove the effect of the economic cycle on the P/E ratio. When earnings collapse in recessions, stock prices often do not fall as much as earnings, and the P/E ratios based on the low current earnings sometimes become very large. Similarly, in good economic times P/E ratios can fall and stocks look cheap, simply because the very high current earnings are not expected to last, so stock prices do not increase as much as earnings. By using a 10-year moving average of earnings in the denominator of the P/E ratio, Shiller has smoothed out the business cycle by deflating both earnings and prices to remove the effects of inflation. Shiller also uses the P/E10 to gain insight into future rates of return. That is, if an investor buys an asset when its P/E10 is high, do subsequent returns from that investment turn out to be low, and vice versa?

The P/rent ratios reported thus far are the current year's farmland price divided by current year cash rent. Here, we model our P/rent10 after Shiller's cyclically adjusted P/E ratio. Cash rent and farmland prices are deflated, and the 10-year moving averages of real cash rent are calculated. The P/rent10 ratio is computed by dividing the real farmland price by the 10-year moving average real cash rent. A similar computation is done for operator net returns (P/NR-10). We also compute a P/rent5 ratio by dividing real farmland price by a 5-year moving average of real cash rent.

Figure 2. Current, 5-Year, and 10-Year Cyclically Adjusted P/rent Ratios for West Central Indiana, 1960 to 2023.

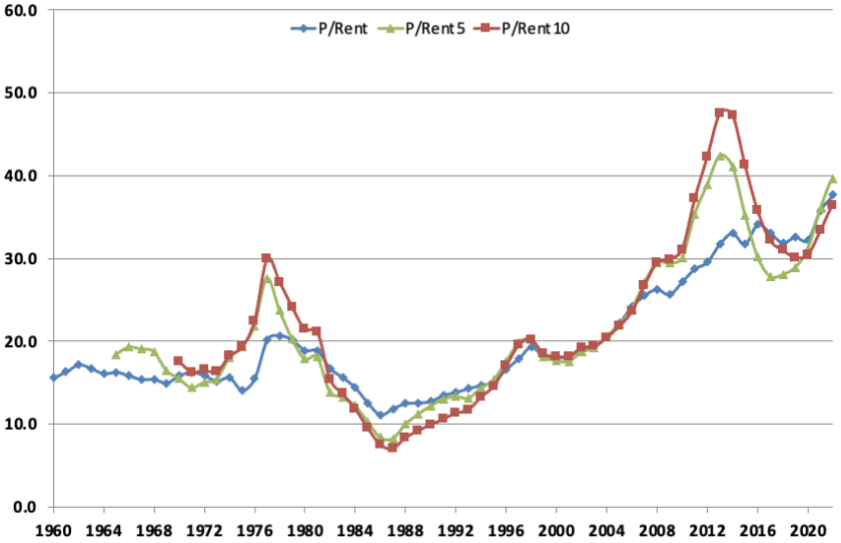


Figure 2 compares the current P/rent ratio with the P/rent5 and P/rent10 ratios. From 2011 to 2015, the P/rent 10 ratio was substantially higher than the P/rent ratio. Essentially, during this time period, current cash rent, used to compute the P/rent ratio, was higher than the 10-year average cash rent. The P/rent5 ratio was also higher than the P/rent ratio during this time period, however this ratio was not as high as the P/rent10 ratio. Assuming that cash rent and interest rates were primary drivers of farmland prices during this period, those purchasing farmland were likely using current cash rents rather than a longer run average of cash rents when evaluating the expected long-run returns from owning land. The P/rent10 ratio is currently lower than the P/rent and P/rent5 ratios, indicating that the ten-year average real cash rent is higher than the current and five-year average real cash rents.

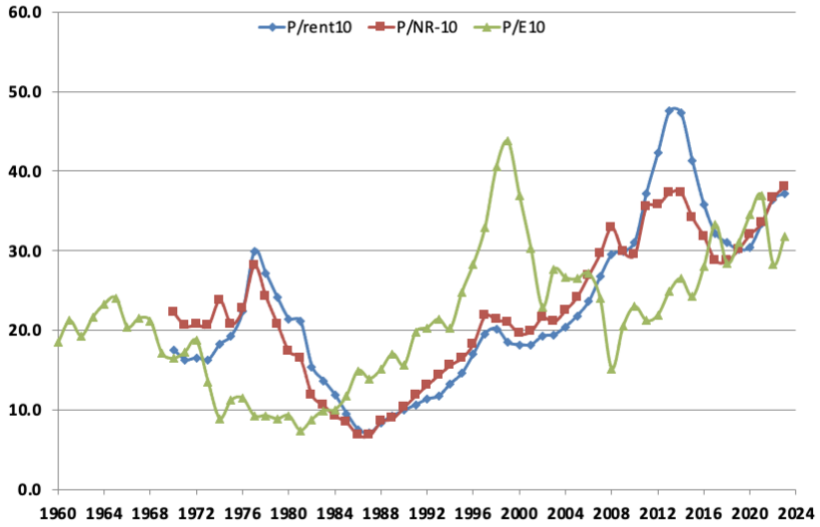
The P/rent10, P/NR-10, and Shiller's P/E10 ratios are illustrated in figure 3. The P/rent10 ratio peaked in 2013 at 47.5. The ratio then steadily declined, reaching a low of 30.1 in 2019. The ratio increased from 30.5 in 2020 to 37.2 in 2023. The current P/rent10 ratio is still relatively high compared to the long-run average (using 1960 to 2023 data) of 22.6. Does the current P/rent10 ratio signify a bubble or is something else going on? With regard to this question, we would like to make two points. First, interest rates have been very low compared to the long-run averages since 2008. The rate on 10-year treasuries has averaged only 2.5% since 2008. Second, as we note below, the P/rent10 and P/NR-10 ratios appear to be equilibrium.

The P/NR-10 ratio fell through the first half of the 1970s when real returns grew faster than land values, increased from around 20 in the mid-1970s to 28.2 in 1977, and then fell to 6.8 in 1987. The P/NR-10 ratio then increased steadily until it reached a peak of 37.3 in 2014. The P/NR-10

ratio has ranged from 28.7 to 38.1 since 2014. From 2015 to 2018, the P/NR-10 ratio was smaller than the P/rent10 ratio, indicating that ten-year average cash rents were smaller than ten-year average net returns to land. In 2019, the P/rent10 and P/NR-10 ratios were similar. For the last four years, the P/NR-00 ratios have been slightly higher than the P/rent10 ratio. In the long-run, you would expect the two ratios to be similar. In fact, the average P/rent10 and P/NR-10 ratios for the 1960 to 2023 period were 22.6 and 22.4, respectively. The current ratios (37.2 for P/rent10 and 38.1 for P/NR-10) appear to be close to an equilibrium.

It is evident from figure 3 that there is not a close link between the P/E10 ratio and the P/rent10 ratio. The P/E10 ratio was much higher than the P/rent ratio from 1995 to 2002. In contrast, the P/E10 ratio was quite a bit lower than the P/rent ratio from 1976 to 1981, from 2011 to 2015, and during the last couple of years.

Figure 3. Ten-Year Moving Average of Cyclically Adjusted P/rent, P/OO, and P/E Ratios, 1960 to 2023.



Buy at a High Ratio: Get a Low Future Return?

Shiller also discusses the relationship between the P/E10 ratio and the annualized rate of return from holding S&P 500 stocks for long periods. In general, his results show that the higher the P/E10 ratio at the time of purchase, the lower the resulting multiple year returns, like for the next 10 or 20 years. The west central Indiana farmland and cash rent data from 1960 to 2023 are used to compute 10-year and 20-year annualized rates of return. Returns are the sum of the average of cash rent as a fraction of the farmland price each year, plus the annualized price appreciation over the holding period.

The results for farmland show a negative relationship similar to that exhibited in Shiller's stock data. The 10-year holding period returns for farmland show a strong negative relationship (Figure 4). That is, if one purchased farmland when the P/rent10 ratio was very high, like now, they tended to have a low 10-year rate of return. Alternatively, if one purchased farmland when the P/rent10 was intermediate or low, they tended to have moderate to high 10-year returns. The 10-year returns ranged from a small negative to 20%. The 20-year holding period returns also exhibit a strong negative relationship with the P/rent10 ratio (figure 5). The 20-year holding returns range from 6 to 14%.

Figure 4. Ten-Year Rate of Return (left axis) and P/rent10 at the Time of Purchase, 1960 to 2012.

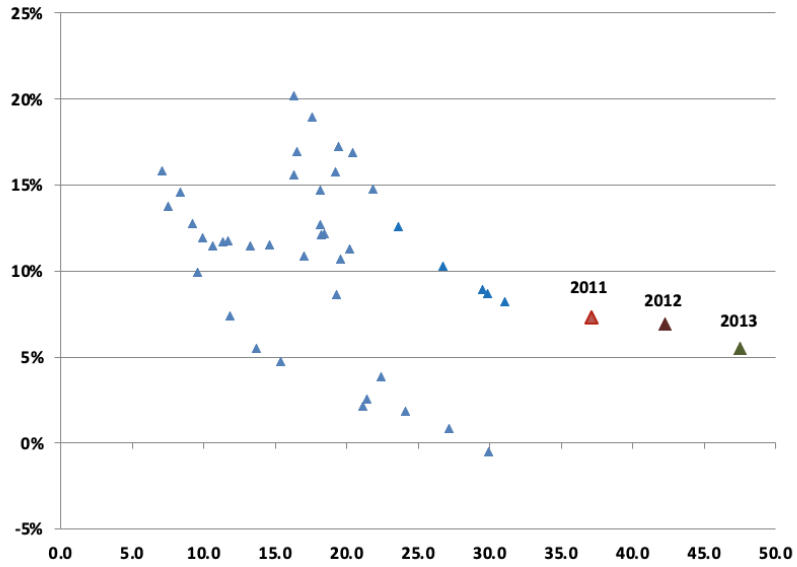
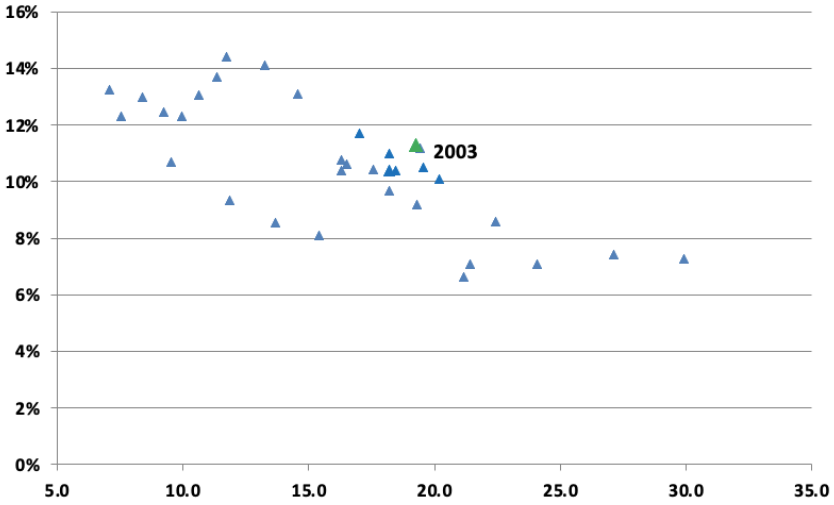


Figure 5. Twenty-Year Rate of Return (left axis) and P/rent10 at the Time of Purchase, 1960 to 2003.



As noted above, figure 4 presents the ten-year rate of return for farmland and the P/rent10 ratio for land purchased in west central Indiana from 1960 to 2013. The P/rent10 ratio in 2013 (i.e., 47.5) was higher than any ratio experienced since 1960. Despite this fact, the ten-year rate of return for farmland purchased in 2013 was still 5.5%. The P/rent10 ratio for land purchased in 2014 is 47.3. The P/rent10 ratio in 2015 is 41.2. From 2016 to 2023, the P/rent10 ratios range from 30 to 37. Will rates of return for land purchased since 2014 stay above 5%? The answer to this question depends on what happens to net returns to land and interest rates. If net returns remain strong and interest rates stay relatively low, the answer to the question is probably yes. The 20-year rate of return for land purchased in 2003 is 11.2%, which is in the middle of the range of 20-year rates of return illustrated in figure 5. Since 1996, the 20-year rate has been in a fairly tight range (i.e., 10 to 12%). It will be interesting to see if the 20-year rate of return declines as the P/rent10 ratio increases in the next few years. For land purchased in 2004 the

P/rent10 is 20.4. In the following five years, this rate will increase to approximately 30. After 2010, the P/rent10 is expected to be above 30.

Final Comments

Our analysis indicates that the P/rent ratio (price per acre divided by cash rent per acre) is substantially higher than historical values. In order to maintain the current high farmland values, cash rents would have to remain relatively high, and interest rates would also have to remain relatively low. Most agricultural economists expect crop net returns to be lower than the levels experienced in 2021 and 2022 in the next few years. What about the capitalization rate, which is computed by dividing cash rent by land values (i.e., the inverse of the P/rent ratio)? The implied capitalization rate in 2023 using west central Indiana data is 2.4. Several factors impact the capitalization rate including interest rates and macroeconomic factors such as rent growth, GDP, credit risk, and asset class. The relationship between the capitalization rate and interest rates is not a one-to-one relationship. Specifically, capitalization rates have a much narrower range than interest rates. Having said that, the recent increases in interest rates puts upward pressure on the capitalization rates. This along with lower net crop returns suggests that the P/rent ratio should at least stabilize, and depending on the impact of interest rates on capitalization rates could even decline in the near future.

We demonstrated that farmland values have tended to have a cyclical component in which farmland values move too high relative to the underlying fundamentals and then over time move too low relative to fundamentals. We use a cyclically adjusted P/rent ratio to show that a very high P/rent ratio, as we have now, tends to be associated with low subsequent returns. Simply stated this means that the historical relationships show that those who bought farmland when the P/rent ratio was high tended to have low subsequent returns. On the other hand, those who bought farmland when the P/rent ratio was intermediate or low, tended to have intermediate or high subsequent returns. The current record high P/rent ratio could be a warning to current farmland buyers that their odds of favorable returns on these purchases are probably not high. Our reading from examining 63 years of history is that the current relationship between farmland prices and cash rents suggests that farmland prices are elevated. If we are correct, this means that those purchasing farmland at current prices may experience "buyer's remorse" in coming years. However, there remain some possible situations in which farmland values could be maintained or even increase. Positive influences on land include relatively low interest rates, the relatively small percent of land currently on the market, the attractiveness of farmland to pension fund managers, and the fact that land is a good hedge against inflation.

References

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PURDUE AGRICULTURAL ECONOMICS REPORT

Article title:	Cash Rental Rates: USDA-NASS vs. Purdue Survey
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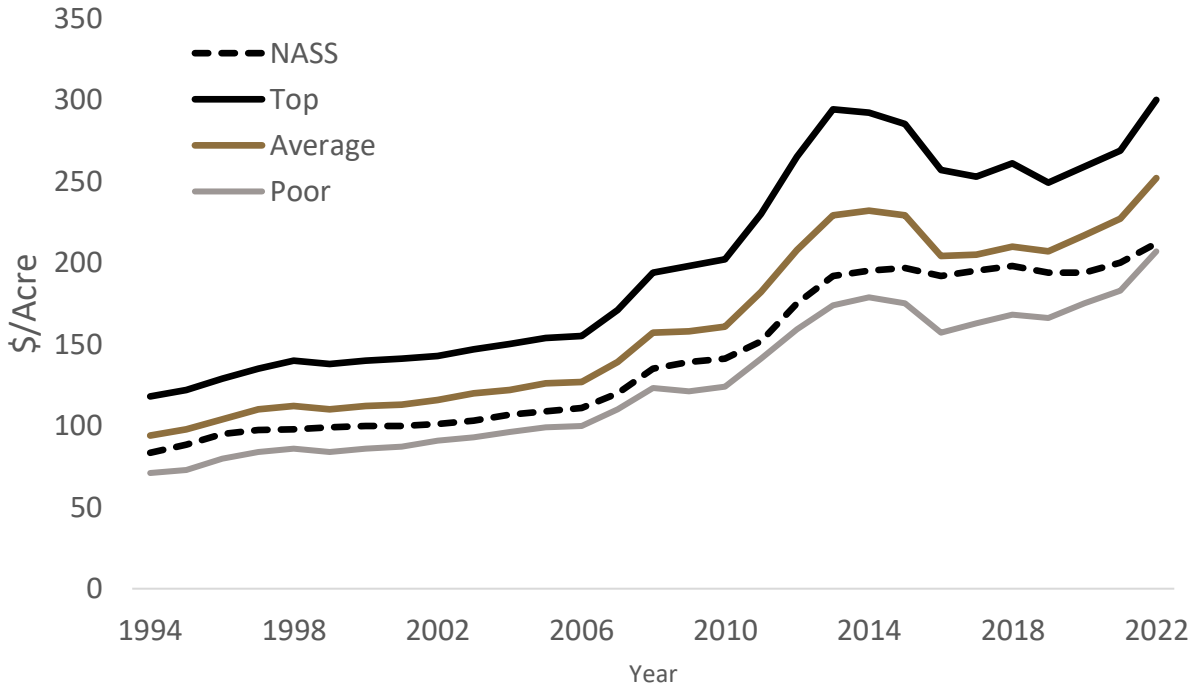
Cash rental rates are an important component of sound farm financial management. Each June, the *Purdue Farmland Value and Cash Rent Survey* collects cash rental rate information from numerous professionals knowledgeable of Indiana's farmland market, including farm managers, rural appraisers, agricultural loan officers, and others. The results provide estimates of the average per acre cash rental rate for bare poor, average, and top quality farmland. The results are reported at the state level and for six regions. The survey is designed to provide helpful information to both famers and land owners.

The National Agricultural Statistics Service (NASS) of the United States Department of Agriculture (USDA) also collects cash rental rate information through the *Cash Rents Survey*. The *Cash Rents Survey* collects information from approximately 280,000 farms and ranches across the United States. Respondents report their total acres operated and acres rented for cash, with the option to also report rent per acre or total dollars paid in rental expense.

Each summer, USDA-NASS reports average per acre cash rental rates at the State level derived from the responses to the *Cash Rent Survey*. These values are plotted, along with the *Purdue Farmland Value and Cash Rent Survey* results, in Figure 1 from 1994 through 2022. It can be observed that the NASS cash rental rates per acre generally fall between the Purdue estimates for average and poor quality land. In addition, the USDA-NASS series exhibits smaller changes from year to year or are "smoothed."

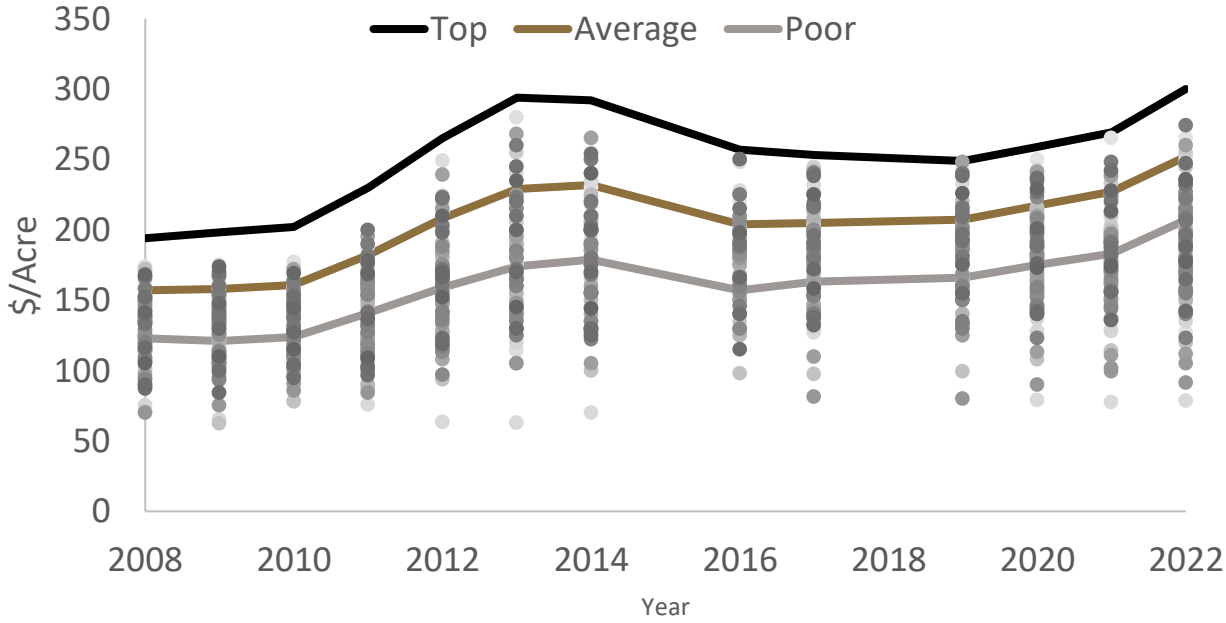
There are a number of reasons why Purdue and USDA-NASS aggregate cash rental rates may differ. The first is the differences in the pools of respondents for both surveys. While USDA-NASS surveys only farm operators, the Purdue survey includes a number of other market experts, including professional farm managers. Generally, farmland that is professionally managed rents for higher per acre value when compared to farmland that is not professionally managed (Schnitkey, et al, 2022). The second reason the two sources of information may differ is the way in which cash rental rates are collected. The Purdue survey asks respondents about the average cash rental rate for bare farmland at a given quality grade in their county, and respondents also provide the expected long-run corn yield for each quality grade in their county. The USDA-NASS survey, on the other hand, provides the option to report the farm-level rental expense on a total or per acre basis.

Figure 1: State-level cash rental rates, Purdue Land Values survey vs. USDA-NASS



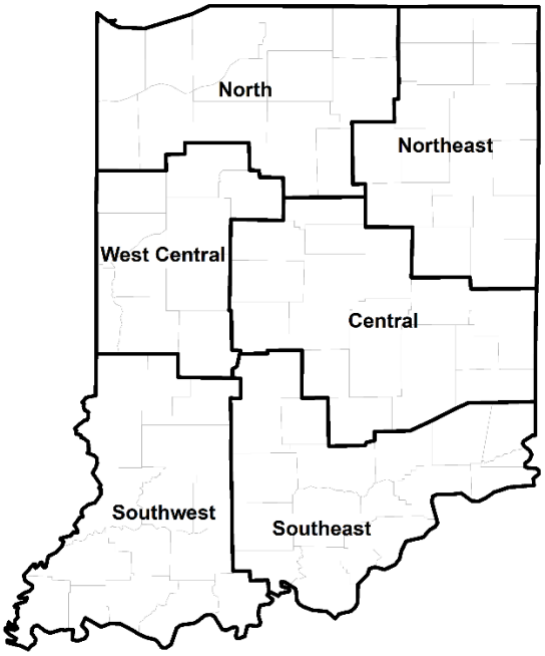
In some years, USDA-NASS also publishes county-level cash rental rates for counties with a sufficient number of responses. Figure 2 plots the county-level USDA-NASS rental rates along with the state-level average per acre cash rents obtained from the Purdue survey from 2008 through 2022. Again, it can be seen that the majority of USDA-NASS county-level rent estimates are clustered between the Purdue estimates for average and poor quality land. However, Figure 2 also illustrates the high variability of county-level rents across Indiana. In some counties, the average rents across the county approach those of state-wide top quality land.

Figure 2: State-level cash rental rates, Purdue Land Values survey vs. USDA-NASS



As mentioned previously, the Purdue survey results are also reported for six regions across the state of Indiana (Figure 3). Figure 4 plots the average per acre cash rental rate for top, average, and poor quality land in each region from 2008 through 2022. The dashed line represents the average of the USDA-NASS county-level rent estimates within each region for the counties for which estimates were published. Again, the patterns observed at the state level in Figure 1 hold for each of the regions. Specifically, USDA-NASS estimates tend to fall between the average and poor quality land estimates from the Purdue survey, and the USDA-NASS estimates appear to exhibit less variation across years.

Figure 3: County clusters used in Purdue Land Values survey to create geographic regions



Summary

When setting cash rental rates, farmers and landowners should consider information from both the Purdue survey and USDA-NASS. Each source of information offers a variety of benefits and challenges. Farmland rental rates vary substantially both across and within counties. Further, most commercial-scale farms rent land from several landlords, and as a result, rental rates can also vary within a single farm enterprise. For this reason, it can be difficult to establish the appropriate rental rate for a specific parcel from aggregate values reported by either USDA-NASS or the Purdue survey.

Purdue Farmland Value and Cash Rent Survey

The Purdue Farmland Value and Cash Rent Survey is conducted each June. The survey is possible through the cooperation and contribution of numerous professionals knowledgable of Indiana's farmland market. These professionals include farm managers, rural appraisers, land brokers, agricultural loan officers, farmers, and Farm Service Agency (FSA) county office directors. These professionals were selected because their daily work requires they stay well informed about farmland values and cash rents.

These professionals provide an estimate of the market value for bare poor, average, and top quality farmland in December 2020, June 2021, and a forecast for December 2021. To assess productivity of the farmland, respondents provide an estimate of long-term corn yield for top, average, and poor productivity farmland. Respondents also provide a market value estimate for land transitioning out of agriculture and for recreational land.

The data reported here provide general guidelines regarding farmland values and cash rent. To obtain a more precise value of an individual tract, contact a professional appraiser or farm manager that has a good understanding of the local market.

Prior reports are located at: https://purdue.ag/paer_archive

Figure 4: Regional cash rental rates, USDA-NASS vs Purdue Land Value survey