

# PURDUE AGRICULTURAL ECONOMICS REPORT

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## INDIANA FARMLAND VALUES AND CASH RENTS CONTINUE DOWNWARD ADJUSTMENTS

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The agricultural press is devoting a significant amount of time to the low commodity prices and the corresponding decline in net farm income. The major decline in margins associated with Midwest crop production continues to ripple through the broader agriculture production sector. The effect of these low margins continue to show up in lower farmland values and cash rents. The Iowa farmland value survey reported an 8.9% decline in 2014. A second decline of 3.9% was reported in 2015. The Ag

Letter published by the Chicago Federal Reserve Bank reported district declines of 3% in farmland values in both 2014 and 2015. The 2014 Purdue Farmland Value survey indicated Indiana's farmland values were at a peak. In 2015, there was a state-wide decline of farmland values of about 5%. The 2016 Purdue Farmland Value Survey indicates a state wide decline of 8.2% to 8.7% (Table I). Declines of this size have not been seen since the mid-80s<sup>1</sup>.

<sup>1</sup> The Purdue Farmland Value Survey was first published in August 1974. Individuals surveyed include rural appraisers, commercial bank and Farm Credit Mid-

America agricultural loan officers, FSA personnel, farm managers, and farmers. Survey results provide information about the general level and trend in

The downward change in farmland values was consistent across land quality and regions of the state. On a state wide basis, farmland values declined for all three qualities of land. Top and average quality farmland declined 8.2% and poor farmland declined 8.7%. The only region of the state to report an increase was the Southeast region. In the Southeast, both top and average quality land increased year-to-year. However, when one looks at the period of December 2015 to June 2016, the values in all regions declined between 3.4% and 6.7%.

The region with the largest year-to-year decline was the North region with declines of 14.2%, 10.7%, and 10.2% for top, average, and poor farmland, respectively. Historically declines of 10% or more are rare. In addition, the farmland value change in this region did not support the conventional wisdom of top quality land maintaining its value better than lower quality farmland in a down turn. The Southwest reported declines between 4.8% and 10.9%. The 6.1% difference between the minimum and maximum decline in this region was only exceeded by the difference of 13.2% in the Southeast. The West Central, Central, and Northeast regions had declines between 4.2% to 9.5%.

Farmland values per bushel of corn follow much the same pattern across regions of the state as changes in farmland values. Survey respondents were also asked to project the value of farmland for December 2016. On average, respondents expect farmland values to continue their decline. The only positive changes expected were top quality farmland in the Southwest region (0.1%) and poor land in the Southeast region (0.4%). Southeast region respondents seem to be anticipating stable farmland values for the remainder of 2016. In all other regions, respondents anticipate further declines in farmland values. This result is not surprising given the outlook for continued low grain prices. State wide, respondents anticipate a decline of 1.9% to 2.2% during the last half of 2016. Projecting this trend through the first half of 2017 will result in an annual decline next year of about 4% state wide.



**Figure 1. County clusters used in Purdue Land Value Survey to create geographic regions**

Information was also gathered about the value of farmland moving out of production agriculture into commercial and residential uses (transition land). The June state wide average value of transition land declined to \$10,506 per acre. From the previous June, this was a decline of 11.2%. The state-wide average value of recreational land had a steep decline, dropping from \$4,523 in 2015 to \$3,433 in 2016, a decline of 24.1%. Transition and recreational land values are quite volatile and have a wide range of values. In these situations, the median value (the value dividing a series of ordered numbers in half) and mode (most frequently reported response) can provide additional information about values. The statewide median and mode for transition land values was \$10,000. The statewide median and mode for recreational land values was \$3,000.

farmland values and cash rents. It does not indicate the specific values for an individual farm.

Respondents were asked to estimate the value of rural home sites located on a blacktop or well-maintained gravel road with no accessible gas line or city utilities. Like transitional farmland and recreational farmland these properties have a very wide range in value. Because of this wide range, median values are reported. The median value for five-acre home sites ranged from \$7,750 per acre in the Southeast region to \$10,000 per acre in the Central and Southwest region (Table 2). Reported per acre median values of the larger tracts (10 acres) ranged from \$7,000 per acre in the Southeast region to \$10,000 per acre in the Southwest, Central, and Northeast region.

### FARMLAND MARKET FORCES

Respondents were asked to evaluate the importance of eleven market forces having the potential to influence the farmland market. These items included: 1) current net farm income, 2) expected growth in returns to land, 3) crop price level and outlook, 4) livestock price level and outlook, 5) current and expected interest rates, 6) returns on competing investments, 7) outlook for U.S. agricultural export sales, 8) U.S. inflation rate, 9) current inventory of land for sale, 10) cash liquidity of buyers, and 11) current U.S. agricultural policy.

Table 1. Average estimated Indiana land value per acre (tillable, bare land), per bushel of corn yield, and percentage change by geographical area and land class, selected time periods, Purdue Land Value Survey, June 2016<sup>1</sup>

Area	Land Class	Corn bu/A	Land Value					Land Value/Bu			Projected Land Value	
			Dollars Per Acre			% Change		Amount	Amount	% Change	Dec. 2016	% Change
			June 2015	Dec 2015	June 2016	6/15-6/16	12/15-6/16	2015	2016	6/15-6/16	2016	6/15-12/15
			\$/A	\$/A	\$/A	%	%	\$	\$	%	\$	%
North	Top	202	9,537	8,630	8,178	-14.2%	-5.2%	47.21	40.49	-14.2%	8,125	-0.6%
	Average	166	7,617	7,115	6,804	-10.7%	-4.4%	45.34	40.99	-9.6%	6,620	-2.7%
	Poor	128	5,611	5,350	5,041	-10.2%	-5.8%	41.26	39.38	-4.6%	4,784	-5.1%
Northeast	Top	188	9,061	8,893	8,594	-5.2%	-3.4%	47.44	45.71	-3.6%	8,339	-3.0%
	Average	162	7,588	7,533	7,243	-4.5%	-3.8%	47.13	44.71	-5.1%	7,028	-3.0%
	Poor	132	6,120	6,213	5,863	-4.2%	-5.6%	47.08	44.42	-5.6%	5,723	-2.4%
W. Central	Top	211	10,383	10,336	9,808	-5.5%	-5.1%	48.75	46.48	-4.7%	9,540	-2.7%
	Average	182	8,913	8,574	8,219	-7.8%	-4.1%	48.97	45.16	-7.8%	8,047	-2.1%
	Poor	155	6,926	6,652	6,341	-8.4%	-4.7%	44.40	40.91	-7.9%	6,249	-1.5%
Central	Top	198	9,578	9,311	8,913	-6.9%	-4.3%	47.42	45.02	-5.1%	8,653	-2.9%
	Average	170	8,176	7,816	7,552	-7.6%	-3.4%	47.26	44.42	-6.0%	7,325	-3.0%
	Poor	143	6,473	6,069	5,857	-9.5%	-3.5%	44.95	40.96	-8.9%	5,786	-1.2%
Southwest	Top	201	10,218	9,747	9,109	-10.9%	-6.5%	50.09	45.32	-9.5%	9,119	0.1%
	Average	163	7,522	7,343	7,017	-6.7%	-4.4%	45.04	43.05	-4.4%	6,890	-1.8%
	Poor	124	4,892	4,987	4,657	-4.8%	-6.6%	39.45	37.56	-4.8%	4,497	-3.4%
Southeast	Top	191	5,113	6,080	5,688	11.2%	-6.4%	27.79	29.78	7.2%	5,678	-0.2%
	Average	153	4,293	4,760	4,441	3.4%	-6.7%	28.62	29.03	1.4%	4,419	-0.5%
	Poor	111	3,423	3,547	3,356	-2.0%	-5.4%	30.03	30.23	0.7%	3,369	0.4%
Indiana	Top	198	9,266	8,977	8,508	-8.2%	-5.2%	46.33	42.97	-7.3%	8,344	-1.9%
	Average	166	7,672	7,381	7,041	-8.2%	-4.6%	45.40	42.42	-6.6%	6,885	-2.2%
	Poor	134	5,863	5,668	5,353	-8.7%	-5.6%	42.80	39.95	-6.7%	5,239	-2.1%
	Transition <sup>2</sup>	XXX	11,829	10,386	10,506	-11.2%	1.2%				10,586	0.8%
	Recreation <sup>3</sup>	XXX	4,523	3,477	3,433	-24.1%	-1.3%				3,373	-1.7%

<sup>1</sup> 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.

<sup>2</sup> Transition land is land moving out of production agriculture into other, typically higher value, uses.

<sup>3</sup> Recreation land is land located in rural areas used for hunting and other recreational uses.

Respondents used a scale from -5 to +5 to indicate the effect of each item on farmland values. A negative influence is given a value from -1 to -5, with a -5 representing the strongest negative influence. A positive influence was indicated by assigning a value between 1 and 5 to the item, with 5 representing the strongest. An average for each item was calculated.

Table 2. Median value of five-acre and ten-acre unimproved home sites

Area	Median value, \$ per acre							
	5 Acres or less for home site				10 Acres & over for subdivision			
	2013 \$/A	2014 \$/A	2015 \$/A	2016 \$/A	2013 \$/A	2014 \$/A	2015 \$/A	2016 \$/A
North	8,500	8,500	10,000	9,500	8,000	8,750	10,000	8,500
Northeast	8,500	10,000	9,500	9,000	10,000	10,000	9,000	10,000
West Central	10,000	10,000	11,000	8,000	9,000	14,000	10,000	9,750
Central	12,000	12,000	11,000	10,000	10,000	10,000	10,000	10,000
Southwest	10,000	9,500	10,000	10,000	10,000	9,500	10,000	10,000
Southeast	6,000	9,000	8,000	7,750	7,000	9,000	8,000	7,000

In order to provide a perspective on changes in these influences across time, data from 2014, 2015, and 2016 are presented in Figure 2. The horizontal axis indicates the item from the list above.

Given the large declines in grain prices and net farm income over the past two years, it is not surprising that respondents placed negative influences on net farm income, expected growth in returns, and crop prices. Even the cash position of buyers has turned slightly negative. Given that cash position was the strongest positive force in 2014, this has been a substantial change in just two years.

Interest rates were the strongest positive influence in 2016. This was followed by alternative investments and the supply of land on the market. Long-term interest rates have been expected to increase for a number of years, but there has been very little upward movement in interest rates. The weak economic growth of the world and U.S. economy have caused the Federal Reserve Bank to postpone further increases in short-term interest rates. The supply of farmland also continues to have a positive influence on the market. One characteristic of the farmland market in decline is a reduction in the quantity of farmland for sale. Rather than sell in a down market, farmland holders tend to postpone

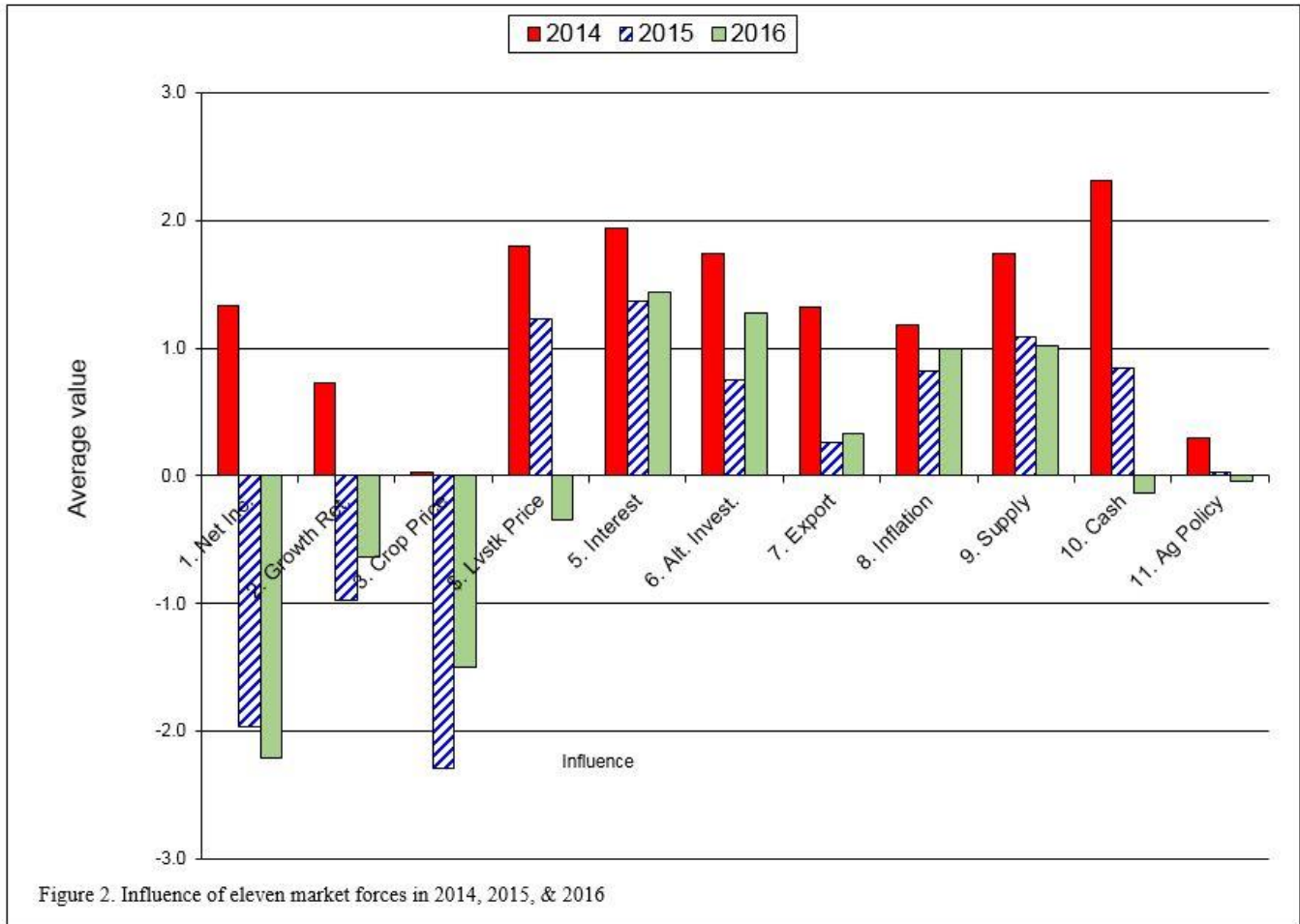
To obtain more information on how selling the supply of farmland may have changed, respondents were asked to compare the amount of farmland on the market in June 2016 to a year earlier and indicate if it was more, the same, or less. Figure 3 reports the results for 1999, 2012, and 2016. There is nothing special about 1999, other than

it was the first year the question was asked. In that year, the majority of the respondents reported the same supply when compared to the previous year. The largest number of respondents reporting an increase in the supply of farmland on the market was in 2011 at 22.6%. In 2016, only a small percentage of respondents indicated more farmland was on the market than a year earlier. For the 2016 respondents, 56% indicated there was less land on the market than in 2015.

Another noticeable change in market drivers is agricultural policy. For the last three years, respondents have indicated agricultural policy no longer has much influence on farmland values. In the past, agricultural policy has been an important influence in the farmland market. Numerous research studies have investigated the link between agricultural policy and distortions in the value of farmland. While the influence of agricultural policy may have declined, other U.S. government policies have had major influences on agriculture. One strong government policy influence has been the low interest rate monetary policy. A second was an energy policy that gave rise to a large increase in corn demand for ethanol. The U.S. farmland market has also been strongly influenced by the decision of Chinese policy makers to import large quantities of U.S. soybeans.

#### FIVE-YEAR FORECASTS

Respondents were asked to forecast the five-year average for corn price, soybean price, mortgage interest rate, inflation rate, and finally the change in farmland value. The price and rate estimates for the past five years



are presented in Table 3. The five-year average price of corn has been the most volatile. In 2012, respondents estimated the corn price would average \$5.56 per bushel. This year the five-year average estimate is \$4.03, a \$1.53 lower. The five-year estimates for soybeans have fared better. For 2012, '13, and '14 respondents expected a five-year average just over \$12.00 per bushel. Lower soybean prices led to a downward revision to the five-year estimate in 2015. The increase in soybean prices this summer, when the survey was taken, no doubt helped lift the 2016 price estimate.

With an average mortgage interest rate of 4.8%, respondents expect interest rates to remain low for the next five years. Concern about monetary policy leading to high inflation rates has declined. Over the past five years, inflation rate expectations have drifted lower.

Given these estimates, where do respondents expect farmland values to be in five years? As expected, there is much less consensus about where farmland values will be in five years when compared to the estimates for the end of 2016. There were three closely balanced groups. One group expects farmland values will be higher in five years. This was 35% of the respondents. The average increase for this group was 7.6%. For this group, the minimum increase was 1% and the maximum was 15%. The second group expected farmland values to be close to their current value. This does not necessarily mean no change in farmland values. There could be ups and downs over five years, but in five years the value will be about where it is today. This was 29% of the respondents. The last group expects farmland values to be lower in five years. This group accounted for 36% of the respondents. The average decline was 9.5% but ranged from a decline of 1.5% to a decline of 35%. Regardless of which group might be the most accurate about the next five years, two

thirds of the respondents are expecting the farmland market to be flat to down, a type of market we have not seen for the past 25-30 years.

### CASH RENT

The survey in 2015 was the first survey since 1999 to report a state wide decline in cash rents across all land qualities. State wide cash rents in 2015 declined 1.3% to 2.4%. Again this year, the survey found another state-wide decline in cash rents (Table 4). This year state-wide declines were more significant, ranging from 9.8% to 10.9%. The last time the cash rent market experienced a decline this large was 1987 when state-wide cash rent declined 8.8% to 10.8%. For 2016, top land had a cash rent of \$257 per acre, average land had a cash rent of \$204 per acre, and poor land had a cash rent of \$157 per acre.

Comparing regional cash rent changes, the Southwest region reported the smallest declines in cash rents ranging from 0% to 2.8%. The largest declines in cash rent were in the West Central region. Here cash rents declined by 11.4% to 14.2%. Changes in cash rents for the North, Northeast, Central, and Southeast regions declined by 1.5% to 11.4%.

The West Central region consistently has the highest cash rents. This is still the case with top quality land having a cash rent of \$296 per acre, average quality land had a cash rent of \$241 per acre, and poor quality land had a cash rent of \$193 per acre. This is followed by the Central, Southwest, North, Northeast, and Southeast regions. As with past surveys, rents in the Southeast region are the lowest.

Cash rent per bushel declined state wide and for each region and land class except the Southwest region where there was no change. State-wide top quality farmland cash rent per bushel of corn was \$1.30, while cash rent per bushel for average land was \$1.23, and cash rent per bushel for poor land was \$1.17 per bushel. As in the past, the difference in cash rent per bushel across land quality is small. For the state as a whole, the difference is only

13¢ per bushel. The largest regional difference in cash rent per bushel across land quality was \$0.16 in the Southwest region. The smallest was \$0.08 in the Southeast region.

On a state-wide basis, rent as a percent of land value remains around 3%. This is the third year in a row this measure of annual gross return has been around 3%. For the last 25 to 30 years, this value has been steadily declining. Looking across regions, the largest return is in the Southeast region with annual gross returns of 3.3% to 3.5%. All other regions except the Northeast have a gross annual return between 2.9% and 3.2%. For the Northeast, this measure of annual return is 2.6% or 2.7%.

### EXPECTED CHANGES IN CASH RENT

Information was presented previously about expected corn and soybean prices, mortgage interest rates and the rate of inflation. Those items also influence changes in cash rent. Respondents were asked to indicate if they expected 2017 cash rents to be higher, the same, or lower. If they expected an increase or decrease, they were asked to indicate the percentage change. Only 3% of the respondents thought 2017 cash rents would be higher. The average increase expected was 8.75%. Respondents expectations ranged from an increase of 2% to 15%. The group expecting no change in cash rent

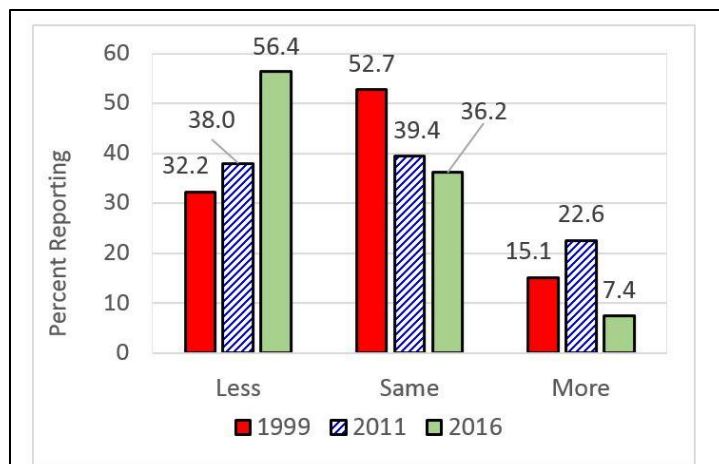


Figure 3. Percentage of respondents indicating there was less, the same, or more land on the market than the previous June

Table 3. Projected five-year average corn and soybean prices, mortgage interest, and inflation

Year	Price \$ per bu.		Rate % per year	
	Corn	Beans	Interest	Inflation
2012	5.56	12.04	5.2%	3.1%
2013	5.52	12.16	5.1%	2.7%
2014	4.70	12.02	5.0%	2.7%
2015	4.02	9.76	5.0%	2.4%
2016	4.03	10.03	4.8%	2.3%
Average	\$4.77	\$11.20	5.0%	2.6%

accounted for 40% of the respondents. The remaining 57% of the respondents expect cash rent to be lower in 2017. The average decline for the group was 8.3%. Respondents expectations ranged from a decrease of 1% to 35%. The average across all respondents was for a decline of 4.5%.

As with farmland, these expectations indicate a continued decline in the rental market. If cash rent declines in 2017, it will be the third decline in a row. There has not been a period of three consecutive declines in cash rents since the 1980s.

Table 4. Average estimated Indiana cash rent per acre, (tillable, bare land) 2015 and 2016, Purdue Land Value Survey, June 2016

Area	Land Class	Corn Bu./A	Rent/Acre		Change '15-'16 %	Rent/bu. of Corn		Rent as % of June Land Value	
			2015 \$/A	2016 \$/A		2015 \$/bu.	2016 \$/bu.	2015 %	2016 %
North	Top	202	284	260	-8.5%	1.41	1.29	3.1	3.2
	Average	166	227	202	-11.0%	1.35	1.22	3.0	3.0
	Poor	128	167	148	-11.4%	1.23	1.16	3.0	2.9
Northeast	Top	188	262	236	-9.9%	1.37	1.26	2.9	2.7
	Average	162	203	192	-5.4%	1.26	1.19	2.7	2.7
	Poor	132	156	150	-3.8%	1.20	1.14	2.6	2.6
W. Central	Top	211	334	296	-11.4%	1.57	1.40	3.4	3.0
	Average	182	281	241	-14.2%	1.54	1.32	3.3	2.9
	Poor	155	224	193	-13.8%	1.44	1.25	3.4	3.0
Central	Top	198	296	271	-8.4%	1.47	1.37	3.2	3.0
	Average	170	241	221	-8.3%	1.39	1.30	3.0	2.9
	Poor	143	188	177	-5.9%	1.31	1.24	3.0	3.0
Southwest	Top	201	278	273	-1.8%	1.36	1.36	2.7	3.0
	Average	163	216	210	-2.8%	1.29	1.29	2.7	3.0
	Poor	124	149	149	0.0%	1.20	1.20	2.9	3.2
Southeast	Top	191	202	199	-1.5%	1.10	1.04	3.6	3.5
	Average	153	152	147	-3.3%	1.01	0.96	3.2	3.3
	Poor	111	118	111	-5.9%	1.04	1.00	2.8	3.3
Indiana	Top	198	285	257	-9.8%	1.43	1.30	3.1	3.0
	Average	166	229	204	-10.9%	1.36	1.23	3.0	2.9
	Poor	134	175	157	-10.3%	1.28	1.17	3.0	2.9

<sup>1</sup> The cash rent reported in this summary represents averages over several different locations and soil types. Determining an appropriate cash rent for a specific property requires more information than is contained in this report. You may also want to obtain advice from a professional that manages agricultural properties.

### COMBINING FARMLAND VALUES AND CASH RENT

One of the principles of economics and finance is that capital assets derive their value from the net cash return generated by the asset. The simplest form of this relationship can be expressed as  $V = E \div C$ ,  $E$  represents the net annual earnings from the asset,  $C$  represents the capitalization rate. The capitalization rate is influenced by interest rates, risk premiums associated with being a landowner, expected rates of inflation, and expected growth rates in the net return.  $V$  is the expected value of the asset.

Doing a few algebraic manipulations, the

expression above can be expressed as  $V \div E = I \div C$ . This expression indicates the value-earnings ratio (or the price-earnings ratio) is equal to one divided by the capitalization rate. This relation tells us how many times earnings buyers are willing to pay to be landowners. It also tells us the value-earnings ratio is determined by the capitalization rate. As earnings rise and fall, the asset value will rise and fall, but if the capitalization rate remains constant, the ratio of value to earnings will remain the same. The value-earnings ratio for 1975 to 2016 is presented in Figure 4.

In 1975, people were willing to pay 13.7 times current cash rent to be landowners. This increased to 20.6 in 1978. With the sharp rise in long-term interest rates in the late 70s and early 80s the multiple dropped to 12.4 in 1986 (higher interest rates increased the capitalization rate). With the downward trend in interest rates (and lower capitalization rates) since 1986, the multiple rose to 34.4 in 2014. The values in 2014, 2015 and 2016 have been fairly constant.

SUMMARY

The collapse in grain prices and the impact of tighter gross margins are working their way through the agricultural economy. While the underlying reasons for multiple years of tight gross margins now are not the same as in the 1980s, a series of years with downward adjustments in farmland values and cash rents like the 1980's may still be the result.

Survey respondents are projecting a continuation of low grain prices, low and stable long-term interest rates, low inflation rates, and lower growth in farmland earnings. If they are correct, the per unit cost of production needs to be lowered further. Lowering per unit cost of production will take time and will likely be a combination of adjustments in lower input costs, higher yields, and lower cash rents

and farmland values, each contributing a small change.

Many of this year's respondents indicate they believe declining farmland values and cash rents are likely to continue being part of reducing per unit production costs. Over the last two years, Indiana farmland values have declined about 13%. While this is only about one-half of the adjustment amount for the first two years of decline in the 1980s, declines this large are rare in the farmland market and it appears the downward value adjustment process is not yet complete. The same is true for the cash rent market where a decline of approximately 12% has occurred over the past two years.

This implies important questions for individuals. How would a continuation of declining farmland values and rents alter your situation or impact your business? What has been your historic breakeven point? What is your current financial position and how would continued downward adjustments affect that position?

If the difference between where you are and where you want to be is small, then you can focus on alternatives for solving this problem. However, if the distance between where you are and where you want to be is large, then you may need to consider a set of more dramatic alternatives. Given the magnitude of the price and income changes that have occurred and the expectations of survey respondents, it seems more adjustments are called for.

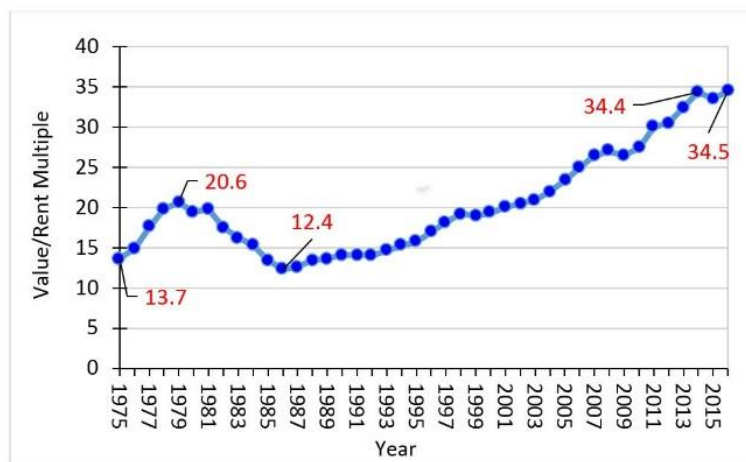


Figure 4. Value to Earnings Multiple for Average Indiana Farmland, 1975 to 2016



# TRENDS IN LAND PRICES, CASH RENTS, AND PRICE TO RENT RATIOS FOR IOWA, ILLINOIS, AND INDIANA

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Farmland prices declined over much of the Corn Belt region during the last couple of years. However, farmland prices remain substantially above historical prices. For example, despite having dropped approximately 12% since 2014, average farmland prices in Indiana are still approximately six times what they were in 1990 and approximately double what they were in 2007 (Dobbins and Cook, 2016). Concerns are still being expressed 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.

This paper examines recent trends in cash rents and farmland prices for Iowa, Illinois, and Indiana, and examines the relationship between farmland price and cash rent for each state. We use USDA-NASS farmland price and cash rent data for each state from 1973 to 2015

to examine recent trends, and to compute farmland price to cash rent ratios. To further examine trends in farmland prices and cash rents, we use data from surveys by Iowa State University (Ag Decision Maker), the Illinois Society of Professional Farm Managers and Rural Appraisers, and Purdue (Dobbins and Cook).

## TRENDS IN CASH RENTS AND LAND VALUES

Table I reports peak years and percentage declines from the peak to 2015 for cash rent and farmland prices in Iowa, Illinois, and Indiana. Using the USDA-NASS data, the peak years occurred one year later than that reported using state surveys. Also, the percentage declines, using the USDA-NASS data, were smaller for each state than they were using the state surveys. Using the state surveys, cash rents and farmland prices peaked

in 2013 in Iowa and Illinois, and 2014 in Indiana. Percentage declines in cash rents from the peak year to 2015 ranged from 1.3% in Indiana to 12.3% in Illinois. For farmland prices, the percentage declines from the peak year to 2015 ranged from 3.8% for Indiana to 17.1% for Illinois.

State survey cash rent data for 2016 is available for Iowa and Indiana, and state survey farmland price data for 2016 is available for Indiana. Percentage declines in cash rent from the peak year through 2016 were

State		Peak Cash Rent (CR)	% CR Decline from Peak to 2015	Peak Farmland Price (P)	% P Decline from Peak to 2015
<u>Iowa</u>					
	USDA-NASS	2014	-3.8%	2014	-6.3%
	Iowa State	2013	-8.9%	2013	-12.4%
<u>Illinois</u>					
	USDA-NASS	2014	-2.6%	2014	-0.1%
	Illinois Society of Profession Farm Managers and Rural Appraisers	2013	-12.3%	2013	-17.1%
<u>Indiana</u>					
	USDA-NASS	2015	0.0%	2014	-0.1%
	Purdue	2014	-1.3%	2014	-3.8%

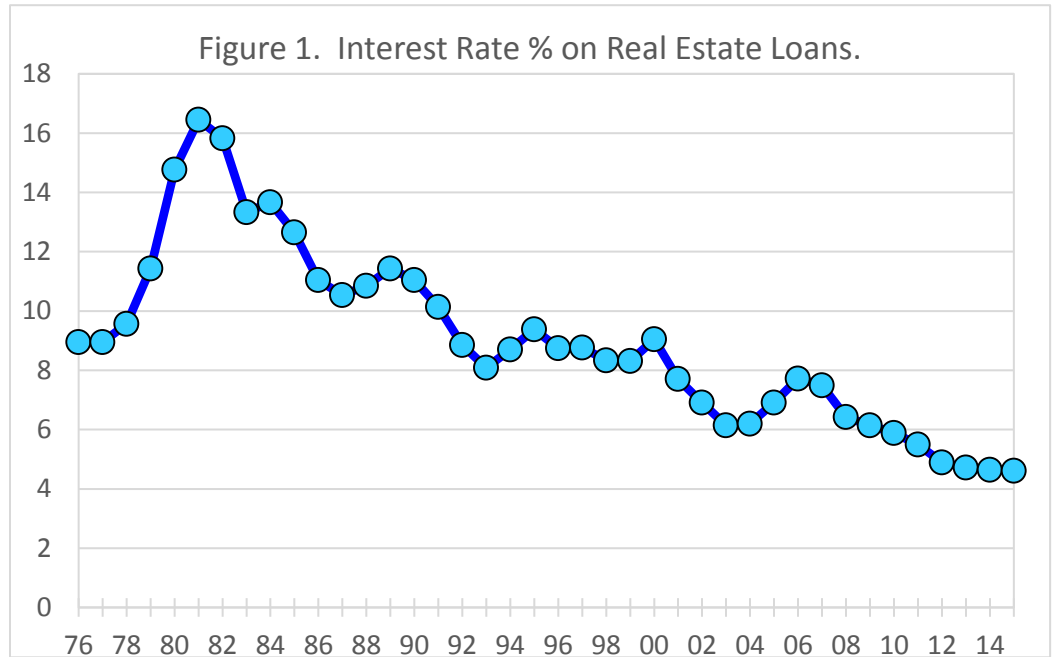
approximately 15% in Iowa and approximately 12% in Indiana. Farmland prices have declined approximately 12% since 2014 in Indiana.

The percentage declines reported above for the past two years are substantially smaller than those experienced in a 6-year period of the 1980s. Using USDA-NASS data, cash rents and farmland prices increased dramatically during the 1970s. Peak farmland prices for the 1980s were reached in 1981 in Iowa, Illinois, and Indiana. Due to low earnings

per acre and high interest rates, cash rents and farmland prices dropped significantly from the peak year through 1987. From 1981 to 1987, cash rent and farmland price in Iowa declined 30% and 65%, respectively. In Illinois, cash rent and farmland price declined 25% and 55%, respectively, while in Indiana the percentage declines were 29% for cash rent and 42% for farmland price.

It is important to remember that the declines in cash rents and farmland prices that occurred in the 1980s lasted six years. During the first year (two years) of the six year decline, average cash rents in the three states increased 2.0% (declined 1.0%), and average farmland prices in three states declined 5.3% (19.3%), respectively. From 2014 to 2015, average cash rents and farmland prices for the three states declined 2.1% and 2.2%, respectively.

What are the differences and similarities in the underlying fundamentals between the 1980s and the current period? We will start by discussing the similarities. In the 1980s, earnings per acre were relatively low for five straight years (1982 to 1987). Similarly, earnings per acre were relatively low in 2014, 2015, and 2016. Continued weak earnings currently appear likely and will put further downward pressure on cash rents and farmland prices.



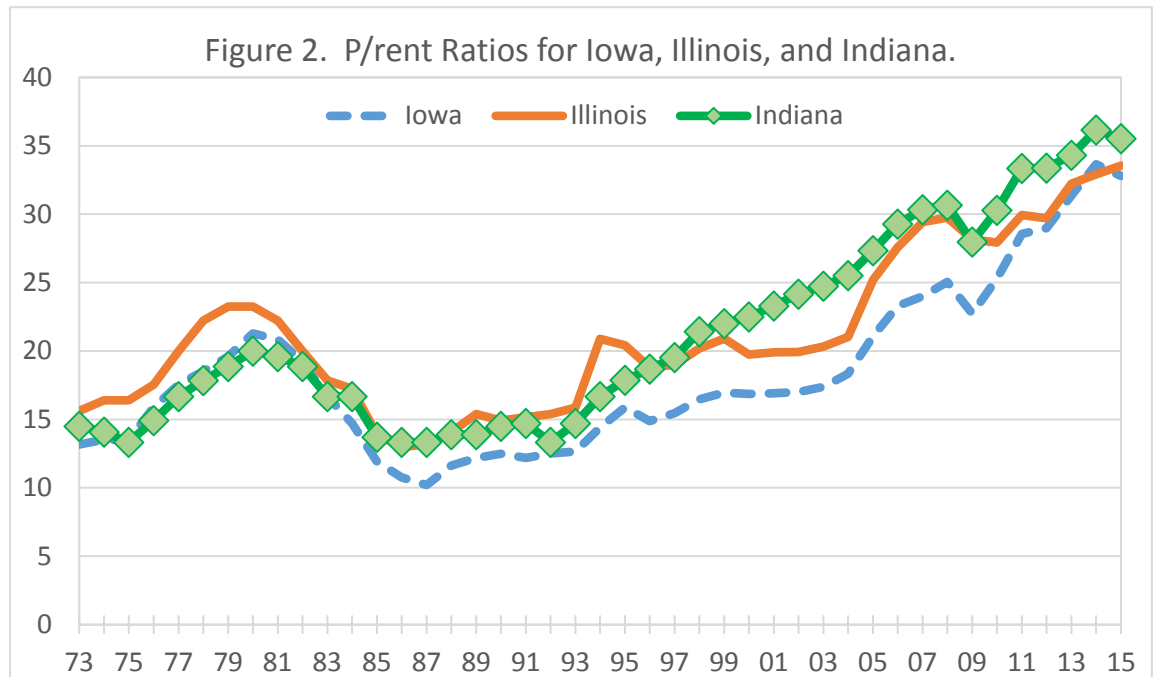
One major difference between the two periods is the trend in interest rates. Figure 1 illustrates the interest rate on real estate loans, using data from the Federal Reserve Bank of Chicago, from 1976 to 2015. Interest rates on real estate loans climbed above 10.0% in 1979, reached a peak of 16.5% in 1981, and stayed above 10.0% until 1992. In contrast, more recent interest rates on real estate loans have been below 5.0% since 2012. The result was much more cash flow stress on debt purchased land in the 1980s than today.

Inflation rates also differ between the two periods (Federal Reserve Bank of St. Louis). Inflation averaged 7.7% from 1973 to 1981, and exceeded 10.0% in 1980. Since 2009, the annual inflation rate has been below 3.0%. The percentage declines in cash rents and farmland prices in Iowa, Illinois, and Indiana this time are not expected to be as large as those experienced in the 1980s, unless earnings per acre collapse even more, or inflation and interest rates increase dramatically

#### SOME DECLINE IN THE PRICE TO RENT RATIO?

A standard measure of financial performance commonly used for stocks is the price to earnings ratio (P/E). A high P/E ratio sometimes indicates that investors think the 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. Using the work of Baker, Boehlje, and Langemeier (2014, 2015), we compute an equivalent ratio for crop agriculture, the



farmland price to cash rent ratio (P/rent). Figure 2 shows the trend in P/rent values for Iowa, Illinois, and Indiana from 1973 to 2015 using USDA-NASS farmland price and cash rent data. As expected, the P/rent ratios for the three states are highly correlated. Over the sample period, the P/rent ratio for Iowa, Illinois, and Indiana averaged 20.3, 21.2, and 21.2, respectively. P/rent ratios increased during the 1970s, peaked in 1980, declined rapidly from 1981 to 1987, and then started increasing in 1988. At the peak in 1980 (trough in 1986/1987), the P/rent ratio in the three states ranged from 20.0 to 23.3 (10.2 to 13.3 in the trough). It is important to note that, even at the 1980 peak, the P/rent ratio for each state was well below the current P/rent ratios.

P/rent ratios have been above the 1973 to 2015 average in Iowa and Illinois since 2005, and in Indiana since 2004. The P/rent ratio peaked at 33.7 in 2014 in Iowa, at 33.6 in 2015 in Illinois, and at 36.2 in 2014 in Indiana. As noted above, the current P/rent ratios are well above their long-run averages, and above the levels experienced in the early 1980s. This leads us to the following question. Will the P/rent ratios in the three states drop significantly during the next few years? The answer to this question is highly dependent on what happens to inflation and interest rates. Farmland is considered a good hedge against inflation over the long-run (Baker, Boehlje, and Langemeier, 2014). If inflation increases, there could be

less downward pressure on farmland price and the P/rent ratio, assuming the inflation increase does not cause a rise in interest rates. Conversely, if the long-term interest rate increases, there will be greater downward pressure on farmland prices and the P/rent ratio. If neither of these occur (increase in inflation or long-term interest rate), the P/rent ratio may decline modestly, but is likely to stay above its long-run average for the foreseeable future.

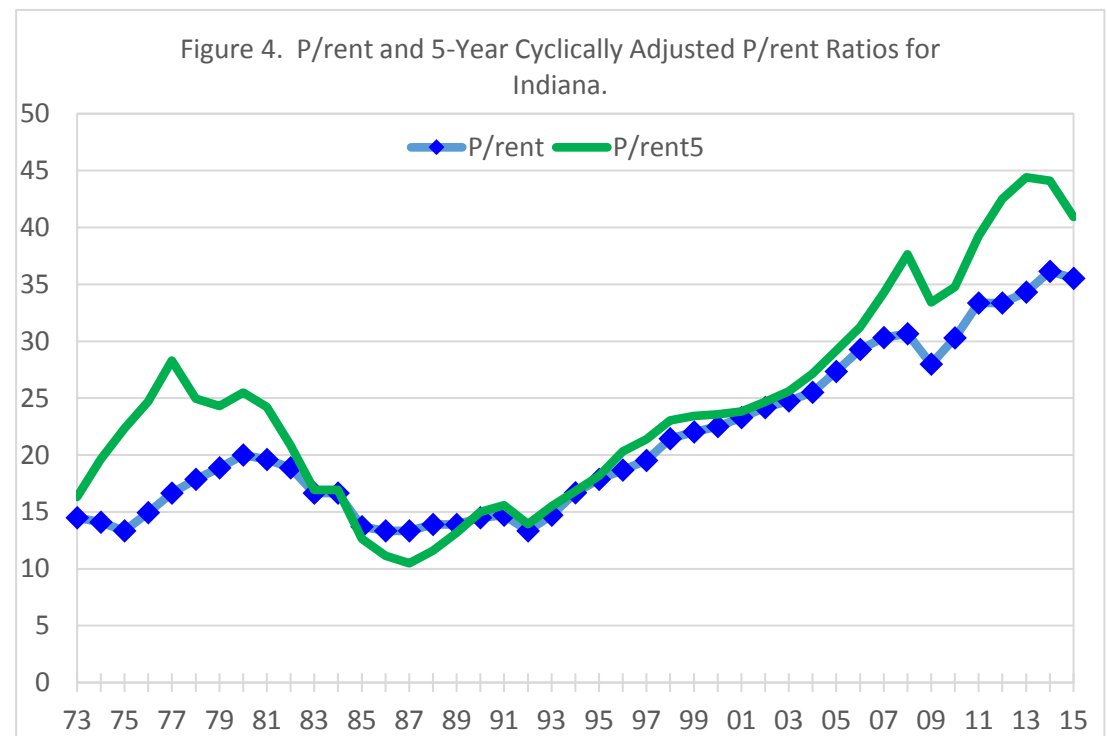
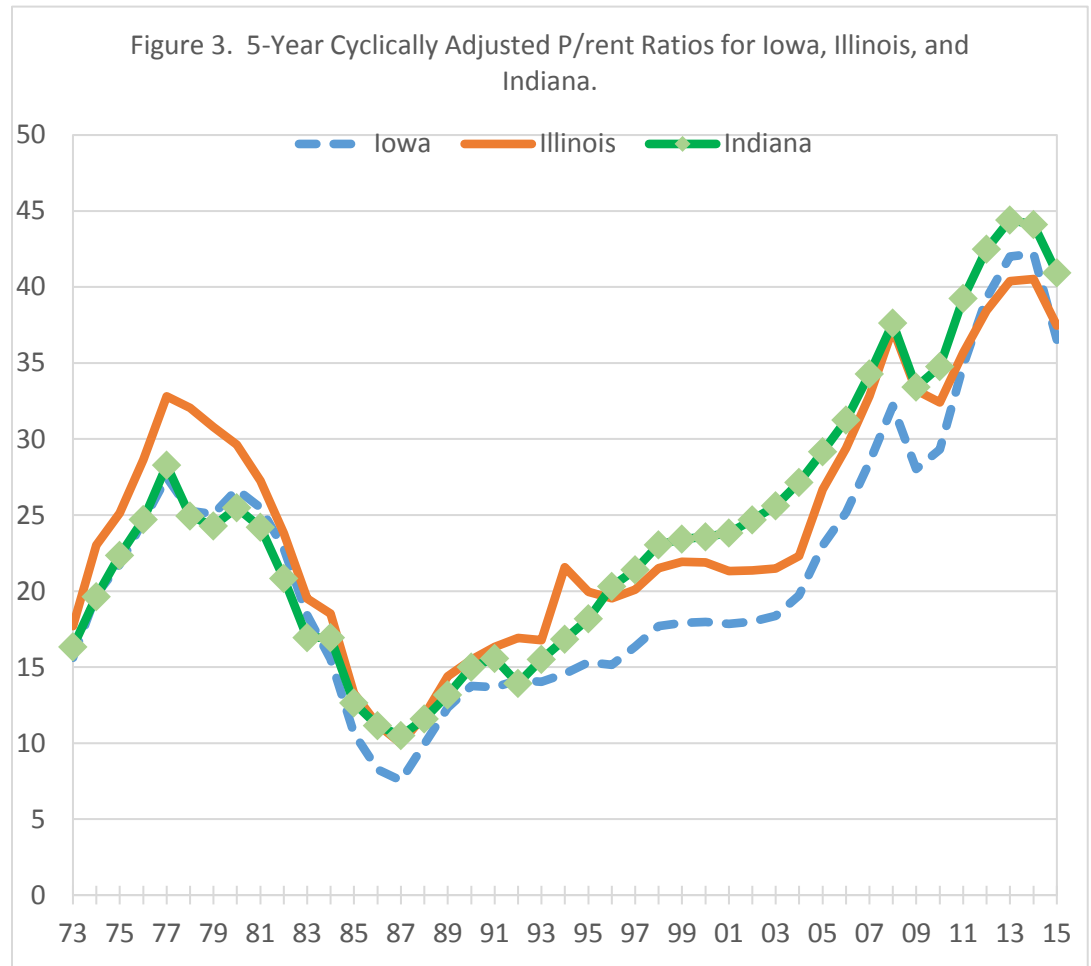
#### CYCLICALLY ADJUSTED PRICE TO RENT RATIO

Shiller (2005; 2014) uses a moving average for earnings in the P/E ratio, often labeled the cyclically adjusted P/E (CAPE), to remove the effect of the economic cycle on the stock market 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 (e.g., in 2009). 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 moving average of earnings in the denominator of the P/E ratio, Shiller's CAPE smooths out these business cycle effects.

The P/rent ratios reported thus far are the current year's farmland price divided by current cash rent. Here we model our P/rent5 ratio after Shiller's cyclically adjusted P/E ratio. The P/rent5 ratio is computed by dividing the current farmland price by the 5-year moving average cash rent.

Figure 3 shows the P/rent5 ratio for Iowa, Illinois, and Indiana. The P/rent5 ratio for each state followed a similar pattern to that of the P/rent ratio in each state. The P/rent5 ratio has been above its average for the 1973 to 2015 period since 2006 in Iowa, since 2005 in Illinois, and since 2002 in Indiana. The peak years and ratios for each state were as follows: 42.2 in 2014 for Iowa, 40.5 in 2014 for Illinois, and 44.4 in 2013 for Indiana. The P/rent5 ratios declined sharply for each state in 2015. The discussion below will focus on the relationship between the two P/rent measures, and projected trends in the P/rent5 ratio.

First, we examine the relationship between the P/rent ratio and the P/rent5 ratio. For ease of illustration, we present the relationship for the two P/rent measures for just Indiana in Figure 4. A couple of observations pertaining to Figure 4 are



particularly noteworthy. The P/rent5 ratio reached a higher peak and exhibited a deeper trough in the 1970s and 1980s than the P/rent ratio. The reason for this difference can be best understood by examining trends in cash rents during the period. Cash rent was rising from 1973 to 1981. This upward trend in cash rent resulted in a 5-year moving average cash rent that was lower than the actual cash rent. Subsequently, the P/rent5 ratio was higher than the P/rent ratio. The opposite occurred from 1982 to 1988 - cash rent declined faster than the moving average of cash rent. This created a lower P/rent5 ratio in comparison to the P/rent ratio.

It is also important to note that the P/rent5 ratio has been higher than the P/rent since 1989. In general, from 1989 to 2014 cash rents steadily increased. These increases were particularly large from 2006 to 2013. These phenomena created a situation in which the P/rent5 ratio was higher than the P/rent ratio, larger differences in the ratios between 2006 and 2013.

For reasons similar to that given for the P/rent ratio, the P/rent5 ratio is likely to stay above its long-run average for the foreseeable future if inflation and interest rates remain low. If the cash rent continues to decline, the P/rent5 ratio will move below the P/rent ratio.

## FINAL COMMENTS

Farmland prices and cash rents have fallen in Iowa, Illinois, and Indiana in the last couple of years. However, our analysis indicates that the P/rent ratio (farmland price per acre divided by cash rent per acre) and cyclically adjusted P/rent ratio (farmland price per acre divided by average cash rent for the previous five years) continue to be substantially higher than historical values.

In order to maintain the current high farmland values, cash rents would have to remain very high, or even move higher, and inflation and interest rates would also have to remain very low. Most agricultural economists expect

crop returns to be modest, putting downward pressure on cash rents, and for inflation and interest rates to move upward in coming years. However, even if they increase moderately, inflation and interest rates are likely to remain below their long-run averages. This suggests that the P/rent and P/rent5 ratios may decline somewhat over the next few years but remain above their long-run averages.

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## THE FAMILY BUSINESS: IDENTIFYING A SUCCESSOR

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**MARIA MARSHALL**, PROFESSOR OF AGRICULTURAL ECONOMICS

There is a large gap between a business owner's desire for their business to continue and actually taking concrete steps to establish a plan for continuity (De Massis et al., 2008; Venter et al., 2005). The Family Business Succession Survey (Marshall et al., 2012) indicated that more than 55% of family businesses plan to eventually transfer the business to a son, daughter, or other family member. However, 44% of family businesses had not yet started a management transfer plan and 54% had not yet started an ownership transfer plan. Moreover, less than 20% of family businesses had a written management or ownership transfer plan in place.

Without plans, disruptions such as sickness of an owner, death of a family business member, a large loss of sales, or loss of key employees can cause businesses to crumble. Choosing a successor is a pivotal step in the succession planning process. When a business chooses a successor, they are concretely saying that they want the business to continue into the next generation.

### HAS THE FAMILY BUSINESS IDENTIFIED A SUCCESSOR?

In this study, we used data from the 2012 Family Business Succession Survey to determine what factors lead a family business to choose a successor. There were 613 businesses in this analysis. The businesses were divided into subgroups of 441 (71.9%) family businesses that did not have an identified successor and 172 (28.1%) which had an identified successor. We wanted to identify variables that increased the odds that a family would have chosen a successor. Those variables that may influence choosing a successor were in three groups: business traits, family traits, and owner traits. The variables are defined in Table I with the averages shown in Figure 1.

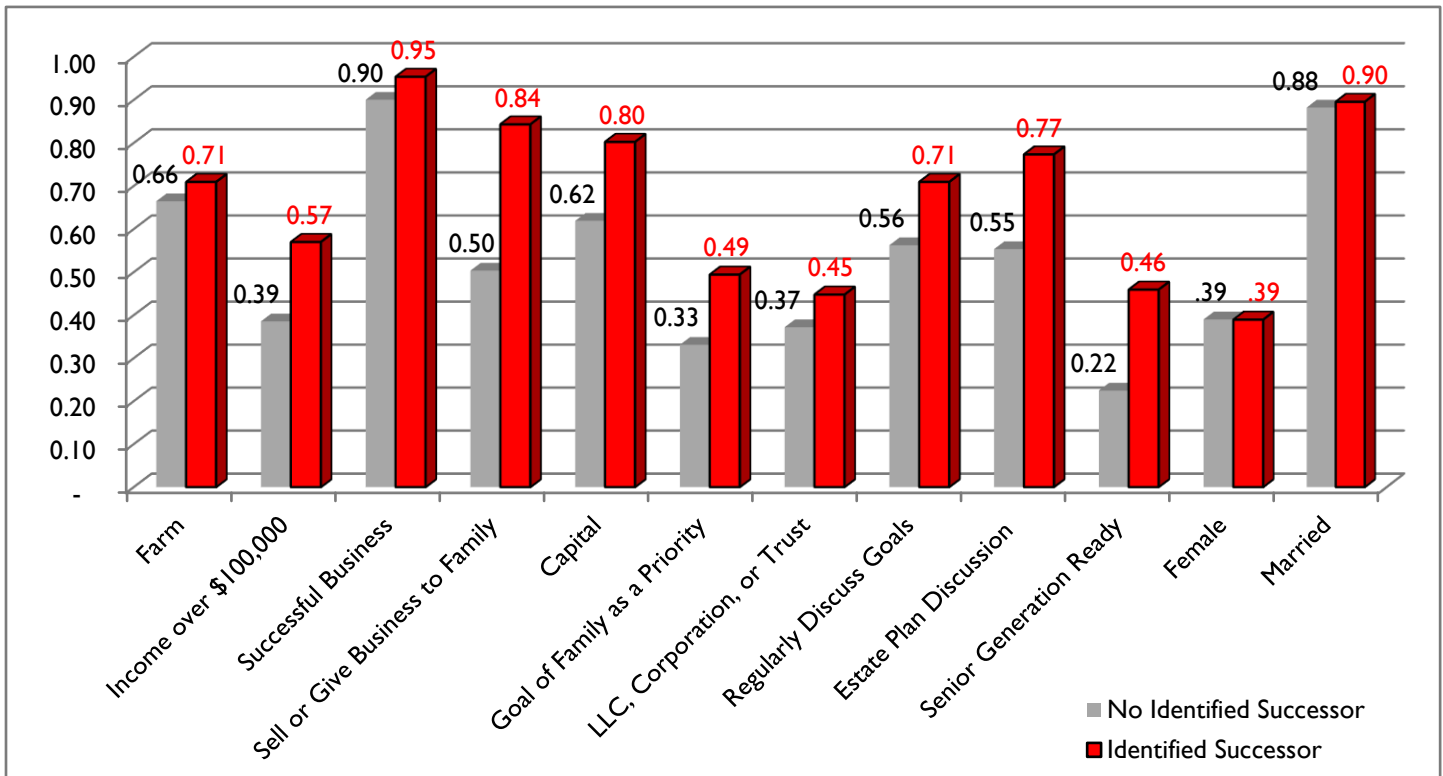
As an example, the size of the business could be a variable that might influence the decision to choose a successor. The second variable in Table I is, "Income over \$100,000." The 613 business respondents answered 1 if the business' gross income was over \$100,000 and 0 if otherwise. The results are as follows: Of the 441 businesses that had not identified a successor, 38.5% had annual gross income above \$100,000, and of the 172 businesses who had identified a successor, 57% had annual gross income above \$100,000. This implies that larger size may be related to the decision to select a successor.

A comparison of the averages for the variables is shown in Figure 1. If the bars on the right (representing family businesses that have identified a successor) have higher averages than the bars on the left (representing family businesses without an identified successor) this may be a variable that is influencing the decision to select a successor. This was the case for most of the variables in this study. The one exception was owner's gender where 39% of the owners were female in both groups.

One of the largest differences between bars in the figure is for "sell or give business to family". In this instance, 50% of businesses without an identified successor have the intention to sell or give the business to family members while 84% of family businesses with an identified successor have that same intention.

### WHAT ARE THE MOST IMPORTANT FACTORS?

The variables that were statistically significant to naming a successor were: 1) the business having the intention to sell or give the business to a family member; 2) if the business has enough capital to implement the business transfer; 3) if the primary goal of the business is family-related; 4) if the business discusses goals at least



**Figure 1. Variables That May influence Businesses to Name a Successor**

quarterly; 5) if the family has discussed estate planning with a professional; 6) if the senior generation is ready to give up control of the business by delegating responsibility to successors or heirs; 7) the number of generations in the day to day management of the business; and 8) years of experience of the business owner.

In the study, family-related matters play heavily on whether a family business had identified a successor. If the business owner had the intention to sell or give the business to family heirs or successors, then that business was 23% more likely to have identified a successor. Having sufficient capital to transfer the business and the discussion of goals also play very large roles. If the family has met with a professional such as an accountant, business consultant, financial planner, or a lawyer to discuss an estate plan, then they were 14% more likely to have identified a successor than those who had not met with such professionals. If family business members met at least quarterly to discuss goals, then they had a 9% higher chance of having named a successor versus those businesses who meet yearly or less to discuss goals. The

number of generations that are involved in the day-to-day management of the business had a positive influence on identifying a successor. For each generation that was added to the daily management of the business, there was a 7% greater chance that they had identified a successor. The senior generations' wishes had a positive influence on naming a successor as well. Businesses had an 11% greater chance of having an identified successor if the senior generation was prepared to give up control of the family business by delegating management to heirs or successors.

**SUMMARY: DOES YOUR BUSINESS HAVE A SUCCESSOR?**

Many family business owners would like to see their business continue, but many fewer have actually put plans in place for that to happen. One of the important steps in the process of business continuity is identifying a successor. This article reports on some of the variables that influence family businesses to identify a successor.

The study involved survey results from 613 family businesses. They were divided into two groups: those

**Table 1. Means of Variables Included in the Probit Model<sup>1</sup>**

Variable	Definition	No Identified Successor (n=441) 0.719	Identified Successor (n=172) 0.281
<b>Business Traits</b>			
<i>Farm</i>	=1 if the business has the primary purpose of agriculture, forestry, or natural resources; =0 otherwise	0.664	0.709
<i>Income over \$100,000</i>	=1 if the business had gross income of over \$100,000 in 2010; =0 otherwise	0.385	0.570
<i>Successful Business</i>	=1 if business owner says that the business is somewhat successful or successful; = 0 otherwise	0.900	0.953
<i>Sell or Give Business to Family***</i>	=1 if distribution of the business to the next generation includes selling or giving the business to family successors; =0 if business will be sold to someone outside of the family or liquidated	0.503	0.843
<i>Capital***</i>	=1 if there is enough capital or money to implement a transfer of the business; =0 otherwise	0.619	0.802
<i>Goal of Family as a Priority**</i>	=1 if the primary business goal is business survival, keeping the business in the family, or the opportunity to work with family members; =0 otherwise	0.331	0.494
<i>LLC, Corporation, or Trust</i>	=1 if the business is organized as an LLC, Corporation, or Trust; =0 if business is solely owned or a partnership	0.372	0.448
<b>Family Traits</b>			
<i>Regularly Discuss Goals**</i>	=1 if the family discusses business goals on a quarterly basis or more frequently; =0 otherwise	0.562	0.709
<i>Estate Plan Discussion***</i>	=1 if the family has ever met with an accountant, financial planner, lawyer, or business consultant to discuss estate planning; =0 otherwise	0.553	0.773
<i>Senior Generation Ready***</i>	=1 if the senior generation is very much or extremely prepared to give up control of the family business by delegating management to heirs or successors; =0 otherwise	0.224	0.459
<i>Generations in Management***</i>	=number of generations of family members involved in the day to day management of the business	1.438	1.820
<i>Business Family Balance</i>	6-point Likert scale of how the family deals with conflict and whether the business always comes first (=1) or the family always comes first (=6)	4.134	4.180
<b>Business Owner Traits</b>			
<i>Experience**</i>	=business owner's age in 2010 less years of education obtained	44.751	46.878
<i>Female</i>	=1 if business owner is female; =0 otherwise	0.390	0.390
<i>Married</i>	=1 if the business owner is married; =0 otherwise	0.882	0.895

<sup>1</sup> Note: Single, double, and triple asterisks (\*, \*\*, \*\*\*) denote statistical significance at the 10%, 5%, and 1% levels from the probit model, respectively.

who had identified a successor and those who had not identified a successor. A set of variables that might influence families to identify a successor was developed.

Then these variables were compared between the group that had identified a successor and the group that had not. The average response for each group was compared,



and tests for statistical significant differences were also evaluated.

Goals and family business expectations have a very distinct influence on family business continuity planning. Having the business thrive for the benefit of the family is an important orientation. There is a greater link to continuity when family business members work closely together. This includes discussing business goals on a regular basis, working on an estate plan, working with attorneys or similar professionals, and when the senior generation has the willingness to relinquish some of the control of the business.

Family businesses are strengthened by the presence of their families, and nothing makes this clearer than the overwhelming significance of family variables in our model. When the owner has the intent to sell or give the business to family heirs and successors, then they take distinct steps to make that plan a reality. When more generations of the family are involved in the daily management of the business, that business has a better chance of planning for an intergenerational transfer. Finally, as family members age and gain more experience,

they have a greater interest in finding a successor and having sufficient capital in the business to implement the transfer is also important.

Family business continuity is a primary objective for many. The odds of reaching that goal can be enhanced by families working closely together and by elevating the goal of continuity within the family. Ultimately, developing a continuity plan and implementing that plan is critical.

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