

PURDUE AGRICULTURAL ECONOMICS REPORT

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NEWS STRAIGHT FROM THE EXPERTS

AUGUST 2018

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2018 INDIANA FARMLAND VALUES - UP, DOWN, & SIDEWAYS

CRAIG DOBBINS, PROFESSOR OF AGRICULTURAL ECONOMICS

The direction of change in Midwest farmland value has been a challenge to discern. In [Iowa, the December 2017 report](#) indicated the average value of farmland had stopped declining and increased 2% from 2016. The [March 2018 Nebraska report](#) indicated the average market value of farmland declined by 3% compared to the year earlier value. The [February 2018 Minnesota report](#) showed a statewide farmland sales prices declined by 8%. The [quarterly report by the Chicago Federal Reserve Bank issued May 2018](#) indicated a 1% decline in Illinois for the period of April 1, 2017 to April 1, 2018. This survey reported a 3% increase for this period in Indiana, a 2% increase in Iowa, and a 3% increase in Wisconsin. For the entire district, farmland values were stable.

These reports illustrate your experience with changes in farmland values is likely to depend on where you are located. The 2018 Purdue Farmland Value Sur-

vey¹ also indicates a mixture of increases and decreases in Indiana farmland values and cash rents.

On a statewide basis, June year-to-year farmland value comparisons indicate an uptick for top, average, and poor quality farmland. For the state as a whole, the strongest percent increase was for poor land, increasing 2.4%. Top and average quality farmland rose by 1.6% and 2.1%, respectively (Table 1). Rounding these changes to the nearest percent indicates a 2% statewide increase for each land quality. If one is willing to associate the word modest with these increases, these results indicate the downward adjustment in farmland values may be over.

The 2018 changes in farmland values across regions of the state and quality of farmland was a mixture of increases and decreases. Statewide top quality land had a value of \$8,668 per acre, average quality land

¹This information is a summary of data collected June 2018 as part of the Purdue Farmland Value Survey.

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 2018¹

Area	Land Class	Corn bu/A	Land Value						Land Value/Bu			Projected Land Value	
			Dollars Per Acre			% Change			Amount 2017	Amount 2018	% Change 6/17-6/18	Dec. 2018	% Change 6/18-12/18
			June 2017	Dec 2017	June 2018	6/17-6/18	6/17-12/17	12/17-6/18					
			\$/A	\$/A	\$/A	%	%	%	\$	\$	%	\$	%
North	Top	208	7,932	8,380	8,492	7.1%	5.6%	1.3%	39.07	40.83	4.5%	8,442	-0.6%
	Average	174	6,647	7,096	7,164	7.8%	6.8%	1.0%	38.87	41.17	5.9%	7,104	-0.8%
	Poor	139	4,769	5,244	5,180	8.6%	10.0%	-1.2%	34.31	37.27	8.6%	5,252	1.4%
Northeast	Top	192	8,364	8,215	8,176	-2.2%	-1.8%	-0.5%	42.67	42.58	-0.2%	8,209	0.4%
	Average	166	7,019	6,855	6,818	-2.9%	-2.3%	-0.5%	41.78	41.07	-1.7%	6,818	0.0%
	Poor	142	5,562	5,632	5,557	-0.1%	1.3%	-1.3%	41.51	39.13	-5.7%	5,573	0.3%
W. Central	Top	212	9,241	9,483	9,452	2.3%	2.6%	-0.3%	44.64	44.58	-0.1%	9,352	-1.1%
	Average	185	7,774	7,862	7,815	0.5%	1.1%	-0.6%	42.95	42.24	-1.7%	7,681	-1.7%
	Poor	154	6,209	6,152	6,245	0.6%	-0.9%	1.5%	40.32	40.55	0.6%	6,069	-2.8%
Central	Top	204	8,876	8,972	8,982	1.2%	1.1%	0.1%	44.03	44.03	0.0%	8,844	-1.5%
	Average	175	7,462	7,712	7,684	3.0%	3.4%	-0.4%	43.91	43.91	0.0%	7,596	-1.1%
	Poor	146	6,023	6,214	6,194	2.8%	3.2%	-0.3%	42.42	42.42	0.0%	6,075	-1.9%
Southwest	Top	212	8,984	8,972	8,874	-1.2%	-0.1%	-1.1%	43.19	41.86	-3.1%	8,725	-1.7%
	Average	172	6,271	6,212	6,084	-3.0%	-0.9%	-2.1%	38.01	35.37	-6.9%	5,983	-1.7%
	Poor	130	3,982	4,111	4,032	1.3%	3.2%	-1.9%	31.60	31.02	-1.8%	3,945	-2.2%
Southeast	Top	192	6,038	6,800	6,825	13.0%	12.6%	0.4%	32.82	35.55	8.3%	6,875	0.7%
	Average	153	4,811	5,350	5,450	13.3%	11.2%	1.9%	31.65	35.62	12.5%	5,438	-0.2%
	Poor	115	3,550	3,775	3,831	7.9%	6.3%	1.5%	28.63	33.31	16.3%	3,874	1.1%
Indiana	Top	204	8,529	8,673	8,668	1.6%	1.7%	-0.1%	42.65	42.49	-0.4%	8,603	-0.7%
	Average	173	6,928	7,099	7,072	2.1%	2.5%	-0.4%	40.99	40.88	-0.3%	7,006	-0.9%
	Poor	141	5,280	5,444	5,407	2.4%	3.1%	-0.7%	37.99	38.35	0.9%	5,367	-0.7%
	Transition ²	XXX	11,056	12,729	13,171	19.1%	15.1%	3.5%				12,986	-1.4%
	Recreation ³	XXX	3,724	3,560	3,541	-4.9%	-4.4%	-0.5%				3,555	0.4%

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.

had a value of \$7,072 per acre and poor quality land had a value of \$5,407 per acre.

The Northern and Southeast regions (Figure 1) reported renewed strength in farmland values.

For the June-to-June period, farmland value increases ranging from 7.1% to 13.3%. In the North region, poor quality farmland had the largest percentage increase. Poor quality farmland in the North region increased by 8.6% to \$5,180 per acre. Top quality farmland increased by 7.1% to \$8,492 and average quality farmland increased by 7.8% to \$7,164 per acre. In the Southeast region, average quality farmland had the largest percentage increase. In the Southeast region, average quality farmland increased by 13.3% to \$5,450 per acre. Top quality farmland increased by

13% to \$6,825 and poor quality farmland increased by 7.9% to \$3,831 per acre.

The West Central and Central regions also had increases across all land qualities but they were more modest than the increases in the North and Southeast. For the West Central and Central region, the increase in farmland values ranged for 0.5% to 3.0%. In West Central Indiana, top quality farmland increased by 2.3% to \$9,452 per acre, average quality land increased 0.5% to \$7,815, and poor quality land increased 0.6% to \$6,245. For the Central region, top quality farmland increased by 1.2% to \$8,982 per acre, average quality land increased 3.0% to \$7,684, and poor quality land increased 2.8% to \$6,194.



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

For the Northeast region, declines in farmland values ranged from 0.1% to 2.9%. Top quality, average quality, and poor quality farmland declined by 2.2%, 2.9%, and 0.1%, respectively. The per acre value for top, average, and poor quality farmland in the Northeast was \$8,176, \$6,818, and \$5,557, respectively.

In the Southwest, farmland values were a mixture of increases and decreases. The value of top quality farmland declined 1.2% to \$8,874 per acre and average quality farmland declined 3.0% to \$6,084 per acre. Poor quality land increased 1.3% to \$4,032.

For areas with increasing farmland values, the increases appear to have occurred between June 2017 and December 2017. For this period, there were more positive changes than negative changes. For December 2017 to June 2018, the percent increases were smaller. There were also farmland value decreases. The later period had a larger number of negative changes than positive changes.

Historically the highest farmland values have been in the West Central region. For 2018, this continues to be true. Top quality land was \$9,452 per acre. Average and poor quality farmland was \$7,815 and \$6,245, respectively. The next highest region was the Central region. The least expensive farmland continues to be in the Southeast region.

Per acre farmland values adjusted for productivity provides an estimate of farmland cost per unit of productivity. The unit of productivity used was an estimate of long-term corn yield. Dividing per acre values by long run yields provides the value or cost of farmland per bushel. Based on this cost measure, the highest priced farmland remains in the West Central and Central regions. The per bushel farmland cost for these two regions varied from \$40.55 to \$44.58 per bushel, a difference of \$4.03 per bushel. After the West Central and Central regions, the next most expensive regions were the North, Northeast, and the Southwest. For these regions, the cost of farmland per bushel ranged from \$31.02 to \$42.58. In the Southeast, the per bushel cost across farmland quality ranged from \$33.31 to \$35.62.

Comparing each region across farmland quality, the smallest difference between the high and low cost per bushel was \$1.61 in the Central region. The Southeast had a difference of \$2.31 the Northeast a difference of \$3.45, the North a difference of \$3.90, the West Central a difference of \$4.03, and the Southwest a difference of \$10.84.

To gain insight into changes the future may hold, survey respondents projected the expected December 2018 value of farmland. For the whole state, respondents expect farmland values to decline slightly. Declines of 0.7%, 0.9%, and 0.7% were forecast for top, average, and poor quality land, respectively.

In the West Central, Central, and Southwest declines in value are expected across all land qualities. Respondents expect these changes to be small, ranging from a decline of 1.1% to 2.8%.

The North and Southeast regions have a mixture of increases and decreases. In the North, top and average quality farmland is expected to decline 0.6% and

0.8%, respectively. Poor quality land in the North is expected to increase 1.4%. In the Southeast, average quality land is expected to decline 0.2% and top and poor quality land is expected to increase 0.7% and 1.1%, respectively.

In addition to the economic profitability of production agriculture, many nonfarm factors influence farmland values. One of these nonfarm factors is the demand for additional commercial and residential development. Information about the value of farmland moving out of production agriculture into commercial and resi-

dential uses

(transition land)

was also gathered.

The June statewide average value of

transition land in-

creased to \$13,171

per acre. From the

previous June, this

was an increase of

19.1%. The

strength of the gen-

eral economy likely is a major positive influence associated with this change. The statewide average value of recreational land declined in 2018 from \$3,724 in June 2017 to \$3,541, in June 2018, a decrease of 4.9%.

A characteristic of the transition and recreation markets is a very wide range of values in which location plays an important role in the value of the property. In markets of this type, the median value (the value dividing a series of ordered numbers in half) can give additional information about the central tendency of the farmland values distribution. The statewide median for transition land values was \$10,500 per acre. The statewide median for recreational land values was \$3,500.

Another nonfarm influence effecting farmland values is the demand for rural home sites. Respondents estimated 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 the wide range, median values are reported (Table 2). The median value for five-acre home sites ranged from \$9,000 per acre in the Southeast region to \$10,000 per acre in the all other regions. The value of \$10,000 per acre was commonly reported as the median for larger tracts (10 acres). The North, Northeast, West Central, and Southwest region all had a median of \$10,000 per acre. In the Central region, the median value was \$11,000 per acre. In the Southeast region, the median value was \$7,250 per acre for 10-acre parcels.

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			
	2015 \$/A	2016 \$/A	2017 \$/A	2018 \$/A	2015 \$/A	2016 \$/A	2017 \$/A	2018 \$/A
North	10,000	9,500	9,750	10,000	10,000	8,500	10,000	10,000
Northeast	9,500	9,000	9,750	10,000	9,000	10,000	10,000	10,000
West Central	11,000	8,000	9,125	10,000	10,000	9,750	8,000	10,000
Central	11,000	10,000	10,000	10,000	10,000	10,000	10,000	11,000
Southwest	10,000	10,000	10,000	10,000	10,000	10,000	9,000	10,000
Southeast	8,000	7,750	10,000	9,000	8,000	7,000	8,000	7,250

Farmland Market Forces

Respondents evaluated the importance of eleven market forces having the potential to influence the farmland market. These forces 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 alternative investments, 7) outlook for U.S. agricultural export sales, 8) U.S. inflation rate, 9) current supply of land for sale, 10) cash liquidity of buyers, and 11) current U.S. agricultural policy.

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 being the strongest negative influence. A positive influence is given a value between 1 and 5, with 5 representing the strongest. An average for each item was calculated. To provide a perspective of the change in these influences across time, data from

2016, 2017, and 2018 are included in Figure 2. The horizontal axis shows the item from the list above.

For 2018 there were only two positive influences found, the inflation rate and the current supply of farmland for sale. Given the continued low grain prices and net farm income over the period of 2016, 2017, and 2018, it is not surprising respondents placed a negative

influence on net farm income, expected growth in returns, crop prices, and livestock prices. Respondents have become less negative about net income (#1), the expected growth in returns to land (#2), and crop prices (#3). The cyclical nature of production agriculture may influence the less negative influence of these factors. Low prices signal the need for a smaller supply and over time supply does decline helping to increase price. The passage of time also allows producers to reduce the per unit cost of production. The improved assessment of expected farmland return may indicate margin pressure is lessening.

The influence of livestock prices, interest rates, exports and agricultural policy have stronger negative influences in 2018. Livestock prices (#4) have had small negative influences in prior years. Producer losses in the dairy industry and concerns about profitability in the pork and beef industries have likely contributed to increasing the negative view of livestock prices.

Interest rates (#5) show a major shift in direction. In 2016 interest rates had a positive influence of nearly 1.5. In 2018, it is nearly a negative 1.5. While there has been concern about possible increases in long term interest rates for some time, actual increases combined with the Federal Reserve Bank's announced plans to continue pushing interest rates up appears to have raised interest rate concerns.

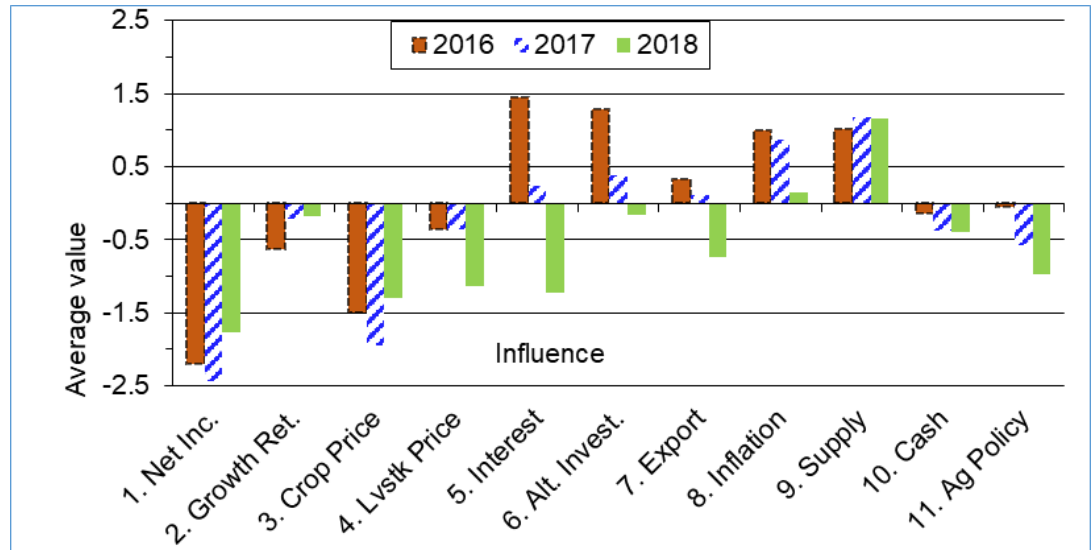


Figure 2. Influence of eleven drivers of Indiana farmland values in 2018

Another noticeable change is the influence of exports (#7). The rhetoric about the unfairness of trade agreements seems to have shifted to a trade war. The actions that will be taken, outcomes associated with possible actions, and how long the trade war will continue are creating a great deal of uncertainty for agriculture. How will the buyers and sellers of farmland respond given the shift from a world trade policy focused on finding new markets and reducing barriers in existing markets to one focused on erecting barriers?

The last noticeable change is the perceived negative influence of agricultural policy (# 11). As someone required to read and study work of other agricultural economists about the market distortions caused by government price support programs and how these distortions were capitalized in to farmland values, finding agricultural policy is now perceived to have a negative influence will likely require, if correct, a change in thinking.

Over the last few years the supply of farmland on the market has been an often-listed reason for why farmland values have not declined further.

When asking respondents to compare the amount of farmland on the market this year compared to last year 45% of the respondents indicated less. This is the third year the response of less has been received from a large percent of the respondents (Figure 3).

Those respondents saying the same amount of farmland on the market as last year was 48%. Given the last three years, even a same response this year is likely to mean the amount of farmland on the market today is less than in 2015.

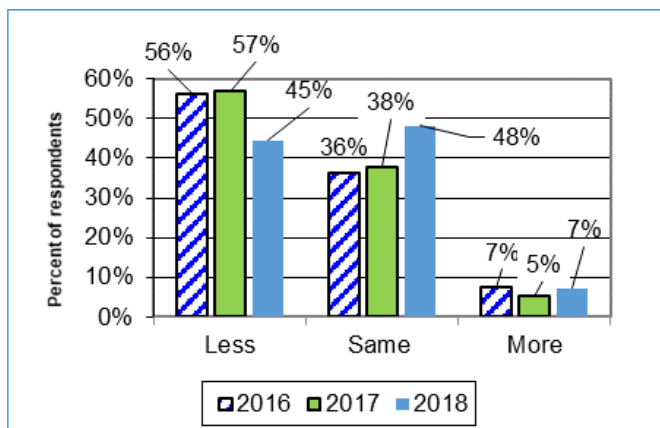


Figure 3. Percentage of respondents indicating less, same, or more farmland on the market than in the previous June

Only 7% of the respondents said the amount of land on the market was more this year than last.

It is common to compare the current downturn in farmland values with the downturn of the 1980s. One of the significant differences between these two downturns is there was an increase in farmland on the market during the 1980s downturn.

Five-Year Forecasts

Respondents were asked to forecast the five-year average 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. Respondents estimated the 5-year average per bushel price of corn in 2014 would be \$4.70. The market realities of 2014 and 2015 resulted in a significant downward revision in 2015. The 2016 corn price was similar to 2015 suggesting a bottom for the 5-year average may have been reached. However, 2017 resulted in another 26¢ decline. The 5-year corn price estimate for 2018 increased by \$0.18 to \$3.97.

Estimates of the 5-year average soybean price have been down and up. Like corn, the 5-year average soybean price started high at just over \$12.00 per bushel in 2014. Lower soybean prices in 2014 and 2015 led

to a downward revision to the five-year estimate in 2015.

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

Year	Prices, \$ per bu.		Rate, % per year	
	Corn	Beans	Interest	Inflation
2014	4.70	12.02	5.0%	2.7%
2015	4.01	8.74	5.0%	2.4%
2016	4.05	10.03	4.9%	2.4%
2017	3.79	9.34	5.1%	2.2%
2018	3.97	9.99	5.5%	2.5%
Average	\$4.10	\$10.02	5.1%	2.4%

Renewed strength in soybean prices resulted in an upward revision in 2016 to \$10.03. There was a 69¢ decline in the 5-year average soybean price in 2017. The 5-year average price in soybean price rebounded again this year.

Stability is the word that applies to the 5-year estimates of interest and inflation rates. With a 2018 average mortgage interest rate of 5.5%, respondents are revising their interest rates upward, but it does not appear they are expecting a substantial increase. Inflation rate expectations increased in 2018 but they are still lower than what was expected in 2014.

Where do respondents expect farmland values to be in five years given these estimates? As expected, there is much less consensus about where farmland values will be in five years than when asking for 2018 year-end estimates. When comparing the three choices of higher farmland prices, lower farmland prices, or farmland prices that are similar to current values, higher farmland prices was the largest group, 52% of the respondents. The next largest group is respondents that expect farmland values in five years to be the same as today (30%). There could be ups and downs over five years, but in five years the value will be about where it is today. The final group is the group of respondents expecting farmland values to be lower in five years (18%).

If you anticipate farmland values will be higher than today, over half of the respondents agree with you. History also supports this view of future farmland values. However, when respondents were asked how much higher farmland land values would be in five years, the group average was 6.8%. By historical standards, a 6.8% increase in farmland values over five years is a very modest increase.

However, a pessimist may look at history and conclude that historically having farmland values at the same or lower value in five years is rare. This might indicate respondents seeing no change or a decline in farmland values in five years have a sense something important has shifted in the farmland market. Combining no change and value decline groups means 48% of the respondents are expecting an outcome in the Indiana farmland market that historically rarely happens.

What might lie ahead for the farmland market? Crop production margins continue to be under pressure. Recent price trends seem to say this margin pressure is likely to continue. Shifting away from a trade policy designed to encourage exports to one designed to create barriers, is not a supportive policy for the agricultural industry and farmland prices. Likewise, continuation of a support price program that does not provide relief during periods of chronically low prices is not supportive of farmland prices. A strong general economy leading to rising long term interest rates creates an even stronger head wind for rising farmland prices.

However, to have a sale someone must be willing to sell. How many sellers will be willing to accept a price lower than last year. Reducing the supply of farmland on the market even further might keep farmland values from declining.

With many negative and few positive forces currently in the farmland market, it seems more likely farmland values will be lower in June 2019. Time will tell.

Cash Rent

The 2015 survey was the first survey since 1999 to report a statewide decline in cash rents across all land

qualities. This year is the first survey since the 2015 survey to report statewide increases in cash rent across all classes of farmland quality.

This year, top quality farmland had a cash rent of \$261 per acre, an increase of 3.2% (Table 4). Average quality land had a cash rent of \$210 per acre, an increase of 2.4%. Poor quality land had a cash rent of \$168 per acre, an increase of 3.1%. In dollars per acre, this was an increase of \$8, \$5, and \$5 for top, average and poor farmland, respectively.

Comparing regional cash rent changes, an increase occurred in all regions. The Southeast reported a cash rent increase for top quality land of 4.5%. Cash rents for average and poor farmland declined. In the Central region, there was an increase of 3.6% for average quality farmland and 5% increase for poor quality farmland. Cash rent for top quality farmland did not change. For the other regions, cash rent increases ranged between 1% and 6.5%. Across farmland quality, the strongest cash rent increase occurred in the West Central region, ranging from 3.1% to 6.5%. The North followed with a range of 2.4% to 5.6%. The Northeast and Southwest regions had similar cash rent increases ranging from 1.0% to 2.7%

The only declines in cash rent for 2018 were in the Southeast region where average quality farmland declined 2.1% and poor quality farmland decline 3.8%.

As with farmland values, the West Central region consistently has the highest cash rents. In 2018, top quality farmland averaged \$297 per acre, average quality farmland averaged \$245 per acre, and poor quality land averaged \$199 per acre. The region with the second highest cash rent was the Central region followed by the North, Southwest (except for poor quality farmland), Northeast, and Southeast region.

Statewide cash rent per bushel stayed the same or increased. Statewide top quality farmland cash rent increased from \$1.27 to \$1.28 per bushel. Cash rent per bushel of corn for poor quality farmland increased from \$1.17 to \$1.19. Average quality farmland cash rent stayed at \$1.21 per bushel of corn. Cash rent per bushel of corn increased for all land qualities in the North, and West Central regions. The

Northeast, Central, Southwest, and Southeast regions were a combination of increases and decreases.

The difference in cash rent per bushel across land quality continues to be small. For the state as a whole, the difference across farmland quality is only \$0.09 per bushel.

The largest regional difference in cash rent per bushel across land quality was \$0.14 in the Southwest region and \$0.13 in the Northeast. The smallest was \$0.05 and \$0.06 in the Central and North region, respectively.

On a statewide basis, rent as a percent of land value remains around 3% (Table 4 and Figure 4). This is

Table 4. Average estimated Indiana cash rent per acre, (tillable, bare land) 2017 and 2018, Purdue Land Value Survey, June 2018

Area	Land Class	Corn bu./A	Rent/Acre		Change '17-'18 %	Rent/bu. of Corn		Rent as % of June Land Value	
			2017 \$/A	2018 \$/A		2017 \$/bu.	2018 \$/bu.	2017 %	2018 %
North	Top	208	249	263	5.6%	1.23	1.26	3.0	3.1
	Average	174	205	210	2.4%	1.20	1.21	3.0	2.9
	Poor	139	159	167	5.0%	1.14	1.20	3.2	3.2
Northeast	Top	192	228	233	2.2%	1.16	1.21	2.7	2.8
	Average	166	187	192	2.7%	1.11	1.16	2.6	2.8
	Poor	142	150	153	2.0%	1.12	1.08	2.6	2.8
W. Central	Top	212	279	297	6.5%	1.35	1.40	2.8	3.1
	Average	185	235	245	4.3%	1.30	1.32	2.9	3.1
	Poor	154	193	199	3.1%	1.25	1.29	3.0	3.2
Central	Top	204	273	273	0.0%	1.39	1.34	3.1	3.0
	Average	175	220	228	3.6%	1.32	1.30	2.9	3.0
	Poor	146	179	188	5.0%	1.28	1.29	3.1	3.0
Southwest	Top	212	257	263	2.3%	1.24	1.24	2.8	3.0
	Average	172	194	196	1.0%	1.18	1.14	2.8	3.2
	Poor	130	140	143	2.1%	1.11	1.10	3.0	3.5
Southeast	Top	192	178	186	4.5%	0.97	0.97	3.1	2.7
	Average	153	142	139	-2.1%	0.93	0.91	3.2	2.6
	Poor	115	106	102	-3.8%	0.85	0.89	3.2	2.7
Indiana	Top	204	253	261	3.2%	1.27	1.28	3.0	3.0
	Average	173	205	210	2.4%	1.21	1.21	2.9	3.0
	Poor	141	163	168	3.1%	1.17	1.19	3.0	3.1

¹ 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 than is contained in this report. You may also want to obtain advice from a professional that manages agricultural properties.

the fifth year in a row the relationship between gross cash rent and farmland value has been approximately 3%. From 1985 through 2014, this value steadily declined. This decline is likely associated with the decline of long term interest rates during this same period.

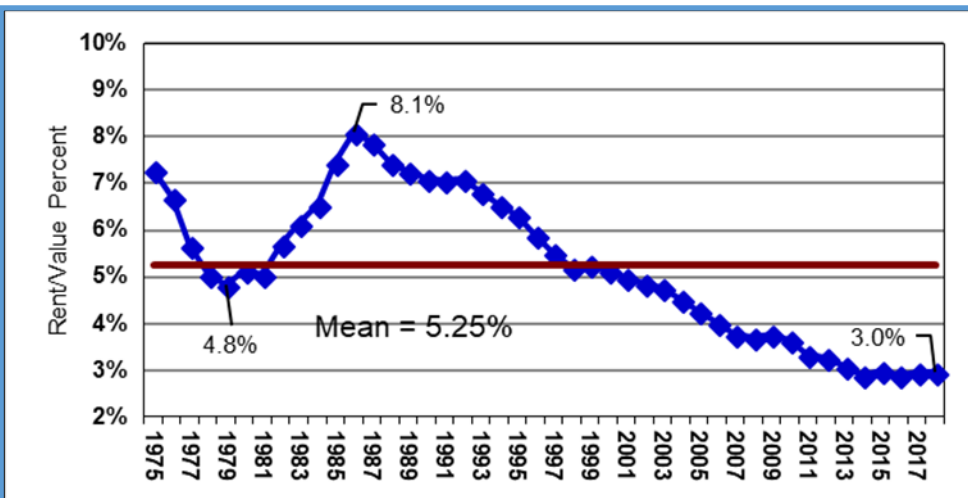


Figure 4. Gross cash rent for average quality farmland divided by value of average value of average quality farmland, 1975 - 2018

Both long term interest rates and rent as a percentage of farmland value have paused. What does the future hold? At this time, further declines in long term interest rates do not seem likely. Long term interest rates could remain stable at current levels, but the most popular scenario seems to be a gradual increase in long-term interest rates.

If long term interest rates rise, it is likely cash rent divided by farmland value will follow. What would cause cash rent as a percent of farmland values to rise? Here are a few possibilities: 1) cash rents could increase more than farmland values, 2) farmland values could remain at current levels while cash rent increases, 3) cash rent could remain at the current level and farmland values decline, and 4) other combinations. As you consider the management of your business, does it matter which alternative emerges?

Expected Changes in 2019 Cash Rent

Information was presented previously about expected corn and soybean prices, mortgage interest rates, the rate of inflation, and their influence on farmland values. These items also influence cash rent. Respondents were asked if they expected 2019 cash rents to

be higher, the same, or lower. If they expected an increase or decrease, they were asked to indicate the percentage change. Just over half, 51%, of the respondents expect cash rents to be the same in 2019. Those anticipating an increase in 2019 cash rent accounted for 22% of the respondents. The average increase for this group was 6.8%.

Those anticipating a decline in 2019 cash rent accounted for 27% of the respondents. The average decline for this group was 6.4%. Combining all three groups provides an overall average decline in the 2019 cash rent of 0.2%

The 2018 survey reported an increase in several cash rents. Given the continued tight margins putting pressure on producers to lower per unit production cost, the size of some of the cash rent increases is surprising. The overall

expectation of survey respondents is for flat cash rent in 2019, but a group of respondents would not be surprised to see an increase of nearly 7% in cash rent. Given the June price declines in corn and soybeans and other June events, rising cash rent seems overly optimistic. Stable cash rent or slight declines seem more likely. Again, time will tell.

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 of numerous professionals knowledgeable of Indiana's farmland market. These professionals include farm managers, rural appraisers, land brokers, agricultural loan officers, Purdue Extension educators, farmers, and representatives of the Farm Service Agency (FSA) county offices. These professionals were selected because their daily work requires they stay well informed about farmland values and cash rents.

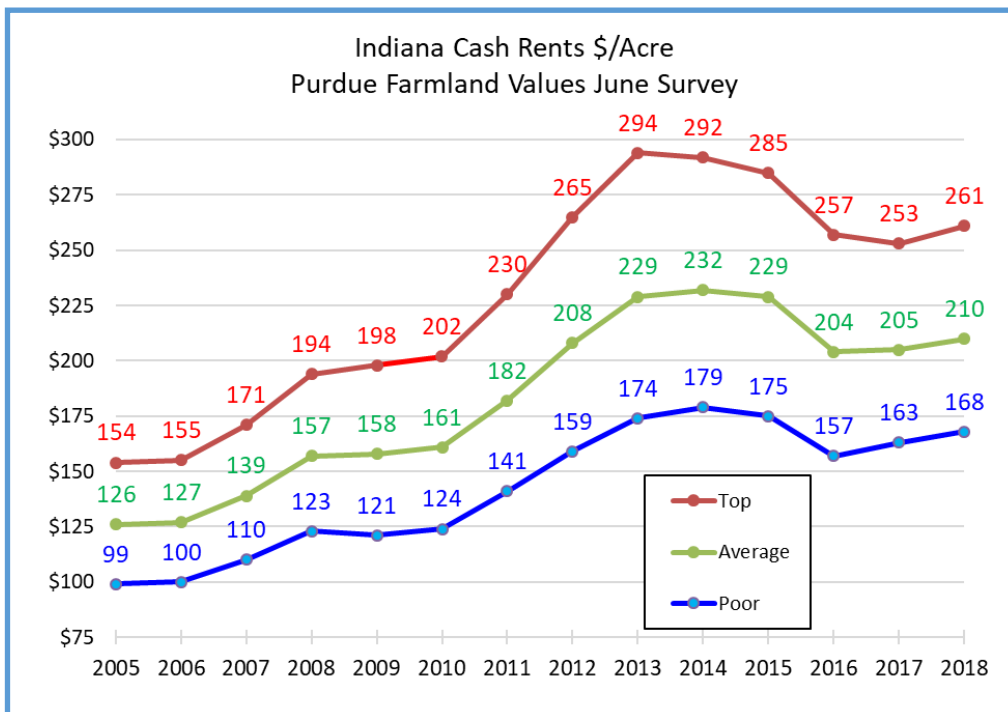
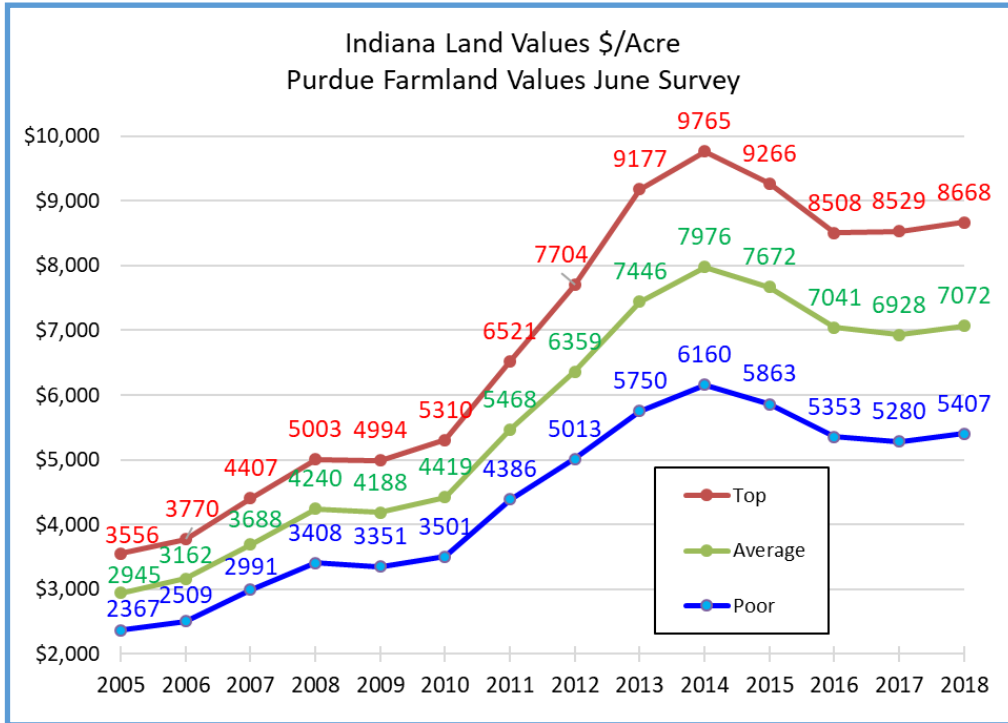
These professionals provide an estimate of the market value for bare poor, average, and top quality farmland in December 2017, June 2018, and a forecast value for December 2018. To assess the produc-

ativity of the farmland, respondents provide an estimate of long-term corn yield. Respondents also provide a market value estimate for land transitioning out of agriculture and recreational land.

We express a special appreciation to the support staff of the Department of Agricultural Economics. Tracy Buck coordinated survey mailings and handled data management. Without her capable assistance, the survey would not have happened.

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

Prior reports are located at: <https://ag.purdue.edu/agecon/Pages/Purdue-Agricultural-Economics-Report-Archive.aspx>



2018 INDIANA PASTURE LAND, HAY GROUND, AND ON-FARM GRAIN STORAGE RENT¹

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Estimates for the current rental value of pastureland, hay ground, and on-farm grain storage in Indiana are often difficult to locate. For the past several years, questions about these items have been included in the Purdue Farmland Value Survey. These tables report the values from the June 2018 survey.

Tables 1, 2, and 3 report averages and the number of responses for pasture rent, hay ground, and the rental of on-farm grain storage, respectively. The rental rate for grain bins includes the situation where there is

just a bin and the situation where there is a bin and utilities.

The first year for reporting this information was 2006. Past reports are in the Purdue Agricultural Economics Report Archive, <http://www.agecon.purdue.edu/extension/pubs/paer/archive.asp>. This information is typically found in the August issue of the specified year. However, 2016 results are in the February 2017 issue and the 2017 results are in the April 2018 issue.

Table 1. Pastureland: Number of responses, annual cash rent, and carrying capacity, June 2018

Region	Number of responses	Annual rent (\$ per acre)	Carrying Capacity (acres per cow)
North	12	\$91	2.0
Northeast	4	\$88	2.1
West Central	14	\$76	1.4
Central	18	\$57	2.5
Southwest	11	\$62	1.9
Southeast	8	\$55	1.7
State	67	\$70	2.0

Table 2. Irrigated farmland: Number of responses, estimated market value, annual cash rent and rent as a percent of farmland value, June 2018

Region	Number of responses	Corn Yield (bu. per acre)	Market Value (\$ per acre)	Cash Rent (\$ per acre)	Rent as % of Land Value	Furnished Well	Furnished Distribution System
North & Northeast	23	238	\$9,371	\$305	3.3%	Landlord 86% Tenant 14%	Landlord 64% Tenant 36%
West Central & Central	10	233	\$8,578	\$301	3.5%	Landlord 50% Tenant 50%	Landlord 25% Tenant 75%
Southwest & Southeast	10	245	9,700	262	2.7%	Landlord 33% Tenant 67%	Landlord 10% Tenant 90%
State	43	238	\$9,264	\$294	3.2%	Landlord 64% Tenant 36%	Landlord 28% Tenant 72%

¹ This information is a summary of data collected June 2018 as part of the Purdue Farmland Value Survey.

Table 3. Rental of established alfalfa hay and grass hay ground, June 2018

Region	Alfalfa/Alfalfa-Grass Hay		Grass Hay	
	Responses	Rent (\$/A)	Responses	Rent (\$/A)
North	14	\$190	12	\$153
Northeast	5	\$156	5	\$121
West Central	10	\$190	10	\$137
Central	13	\$150	13	\$98
Southwest & Southeast	12	\$118	12	\$71
State	54	\$162	52	\$116

Table 4. On-Farm grain storage rental: Number of responses and annual per bushel rent, June 2018

Region	Bins only		Bins and electric utilities	
	Number of responses	Rent (\$/bu.)	Number of responses	Rent (\$/bu.)
North & Northeast	26	\$0.14	22	\$0.19
West Central & Central	31	\$0.16	28	\$0.25
Southwest & Southeast	20	\$0.16	18	\$0.23
State	77	\$0.16	68	\$0.23

FARMLAND ASSESSMENT FOR PROPERTY TAXES IN THE COMING DECADE

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It's been three years since the Indiana General Assembly passed and the Governor signed Public Law 249, changing the method used to calculate the base rate of farmland for property tax assessment. Since then the farmland base rate has fallen from \$2,050 per acre for taxes in 2016 to \$1,850 per acre for taxes this year. The Department of Local Government Finance (DLGF) has set the base rate for taxes in 2019 at \$1,610 per acre. The base rate has dropped 21% in three years.

The base rate is a dollar value per acre calculated by the DLGF each year. It is the starting point for the assessment of farmland for property taxes. The base rate is calculated using a capitalization formula which

divides the net income from an average acre of farmland by a rate of return. This capitalized value is then averaged over 6 years with the highest value dropped.

Public Law 249 made two major changes to the base rate formula. The first required use of more recent data. Now, the base rate for 2018 taxes will use data from 2010 to 2016, instead of 2008 to 2014. A four-year data lag was reduced to two years. Reducing the data lag means that the base rate will follow changes in farm prices and yields more closely, but it does make the base rate harder to predict in advance.

The second change was the most significant and a little harder to explain. The change to the formula intro-

duced a system for adjusting the rate of return, which is also called the capitalization rate. The preliminary capitalization rates are an average of farm loan interest rates for operating loans and real estate, reported by the Chicago Federal Reserve. DLGF uses the same capitalization formula as in the past to calculate a preliminary base rate.

The preliminary base rate is then compared to the existing base rate for the current tax year. If the preliminary base rate is within 10% of the existing base rate, then a capitalization rate of 7% would be used for all 6 years in the final calculation. If the preliminary base rate is more than 10% lower than the existing base rate then a capitalization rate of 6% would be used. And, if the preliminary base rate is more than 10% higher than the existing base rate, a capitalization rate of 8% would be used.

The idea behind the new calculation method is to stabilize the base rate. When the preliminary base rate falls significantly, a lower capitalization rate is used in the denominator of the calculation to lessen the decrease. When the preliminary base rate increases significantly, a higher capitalization rate is used to lessen the increase. And when the preliminary base rate is close to the existing base rate a mid-range capitalization rate is used to keep it stable.

Calculating the Base Rate

Table 1 shows the DLGF’s calculation of the base rate for taxes in 2019. The first part of the table shows the preliminary base rate calculation. Cash rent net incomes per acre are calculated from the Agricultural Economics Department’s survey published annually in the August issue of the PAER. Property taxes are subtracted. Operating net incomes per acre are calculated from prices, yields and costs for

corn and soybeans. Each net income measure is divided by the capitalization rate, to get two values per acre, called the market value in use. The calculations are done for the six years, 2012 through 2017. The highest value (from 2013) is dropped and the remaining five years are averaged, to get \$2,640 per acre.

This is the 2019 preliminary base rate. It would be a 43% increase over the base rate for 2018, \$1,850. Since this is more than 10%, a capitalization rate of 8% is used in the final base rate calculation, shown in the second half of Table 1. The final base rate for taxes in 2019 is \$1,610 per acre, a 13% decrease

Table 1. Preliminary and Final Base Rate Calculation for Taxes in 2019.

Calculation of the Base Rate for an Acre of Farmland						
Preliminary						
Assessment Year 2018; Tax Year 2019						
	<u>NET INCOMES</u>			<u>MARKET VALUE IN USE</u>		
Year	Cash Rent	Operating	Cap. Rate	Cash Rent	Operating	Average
2012	185	116	5.06%	3,656	2,292	2,974
2013	204	341	4.84%	4,215	7,045	5,630
2014	205	171	4.77%	4,298	3,585	3,941
2015	198	-39	4.74%	4,177	-823	1,677
2016	173	75	4.78%	3,619	1,569	2,594
2017	175	26	5.04%	3,472	516	1,994
Average Market Value in Use						\$2,640
Existing Base Rate						\$1,850
Percent Change from Current Rate						43%

Calculation of the Base Rate for an Acre of Farmland						
Final						
Assessment Year 2018; Tax Year 2019						
	<u>NET INCOMES</u>			<u>MARKET VALUE IN USE</u>		
Year	Cash Rent	Operating	Cap. Rate	Cash Rent	Operating	Average
2012	185	116	8.00%	2,313	1,450	1,881
2013	204	341	8.00%	2,550	4,263	3,406
2014	205	171	8.00%	2,563	2,138	2,350
2015	198	-39	8.00%	2,475	-488	994
2016	173	75	8.00%	2,163	938	1,550
2017	175	26	8.00%	2,188	325	1,256
Average Market Value in Use						\$1,610
Previous Year						\$1,850
Percent Change						-13.0%

from the 2018 base rate and a 39% decrease from the preliminary base rate calculation.

Base Rate Likely to Decline More

DLGF has set the base rate for 2019 property taxes at \$1,610. But what about the coming decade? Where do farmland assessments go from here?

The answer is down even more, for at least another two years. Table 1 shows that the capitalized values for 2012, 2013 and 2014 are higher than those in more recent years. The base rate calculation for 2020 will drop the 2012 \$1,881 value and add the value for 2018, which will surely be in the \$1,000 to \$1,500 range, like the values for 2015 to 2017. Replacing a bigger number with a smaller number in the average will reduce the base rate.

Then in 2021 the very high \$3,406 value from 2013 will drop out of the average. This is the high value that is not counted in the calculation anyway. The new high value will be \$2,350 from 2014, so it will also be eliminated from the average. The 2019 value will be included. We don't know what that value will be, but without sharp increases in crop prices or cash rent it will be lower than \$2,350. The base rate will fall again.

More precise forecasts of the base rate require forecasts of commodity prices, rents, yields, costs and interest rates. For taxes in 2020 the formula will use data from 2013 through 2018. Numbers through 2017 are known, and some of the 2018 data is already available so only part of the 2018 data need to be projected. For 2018, current corn bids and the futures were used to estimate commodity prices from June through December of 2018. DLGF will release the 2020 base rate at the end of December or in early 2019.

Plugging these estimates and the known data into the farmland base rate formula gives a preliminary 2020 value of \$2,360 per acre, 47% above pay 2019's base rate of \$1,610. This triggers the use of the 8% capitalization rate in the final calculation, resulting in an estimate of \$1,450 per acre for the pay-2020 farmland base rate—a 10% decrease from pay-2019. Figure 1 and Table 2 show these results.

Beyond 2020 the forecast uses corn prices around

\$3.70 per bushel and soybean prices around \$9.50 per bushel. Average cash rent is projected to fall to \$189 per acre by 2020, and to remain stable after that. Projected property taxes decrease to \$20 per acre by 2021 and stay in the low \$20 dollar range through 2027. Other overhead costs are projected to trend upward by about 1.5% a year.

Interest rates are projected to rise through the mid-2020's, then remain near 6.5%. This is less than the formula's 8% capitalization rate used for the final base rate. As a result, it's likely that the preliminary base rate will remain well above the existing base rate, so the final calculation will continue to use 8% in the denominator. This will continue until actual farm-related interest rates rise much closer to 8% or there is major increase in farm income, sustained for at least two years.

Table 2 and Figure 1 show the projections of both the preliminary and final base rates through 2029. The forecast shows a substantial decline through 2021, and then a relative stabilization of the base rate for the rest of the decade, at levels between \$1,290 and

Table 2. Base Rate Projections, pay-2020-2029

	Preliminary Base Rate	Final Base Rate	% Change in Final Base Rate
2016		2,050	
2017	2,990	1,960	-4%
2018	2,940	1,850	-6%
2019	2,640	1,610	-13%
2020	2,360	1,450	-10%
2021	2,000	1,300	-10%
2022	1,880	1,290	-1%
2023	1,930	1,390	8%
2024	1,860	1,370	-1%
2025	1,800	1,400	2%
2026	1,820	1,440	3%
2027	1,750	1,400	-3%
2028	1,670	1,340	-4%
2029	1,610	1,290	-4%

\$1,440. The projected 8% increase in 2023 occurs because the exceptionally low 2015 value (\$994 in Table 1) drops out of the average in that year.

Of course there will be good and bad crop years and changes to the economy that will affect prices, costs and interest rates over the next decade. The trends

used for these projections do not reflect these ups and downs. With the current trade issues, it's especially difficult to forecast harvest crop prices this year.

Impact on Farmland Taxes

The base rate will fall through 2021, but farmland tax bills probably won't fall as much. Local government property tax rates have been trending

slowly upward. In rural areas where farmland is an important part of the overall tax base, a decrease in assessed values will cause an increase in tax rates, which will partly offset the drop in the base rate. Higher property tax rates mean other taxpayers will pay more. Farmland owners will still pay less.

Data Sources

Long-term projections for commodity prices, yields, variable costs and government payments came from the University of Missouri's Food and Agricultural Policy Research Institute (FAPRI) and were adjusted for Indiana. Cash rent projections were made based on Dr. Michael Langemeier's projected change in

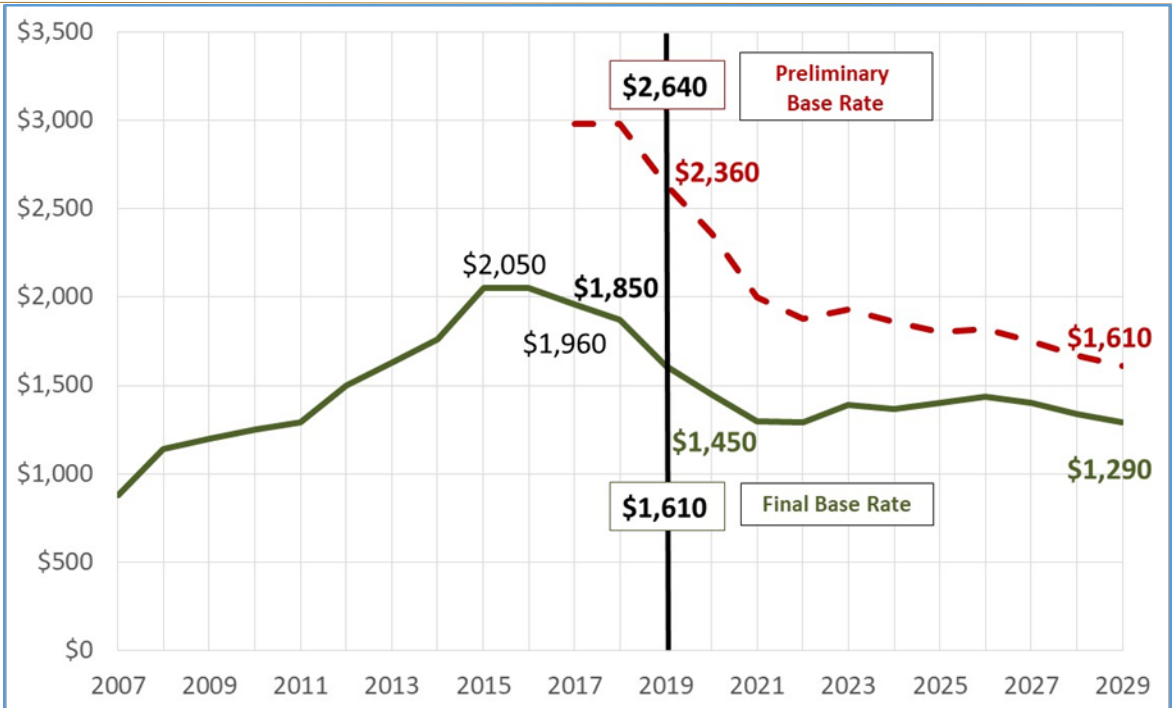


Figure 1. Base Rate per Acre of Farmland for Property Taxation Preliminary and Final Base Rate, 2007-2019 and Projected 2020-2028

cash rents. For the 2018 crop year data was obtained from the sources DLGF uses in the base rate formula if available. Cash prices for June to December were estimated by Dr. Chris Hurt using current bids and future prices adjusted by historic basis. For more information on how this data is forecasted see the Purdue Agricultural Economics Report article from February 2017. <https://ag.purdue.edu/agecon/Documents/PAER%20February%202017.pdf>

The Department of Local Government provides documentation for its base rate calculation on its website. <https://www.in.gov/dlgf/7016.htm>

CREATING A CULTURE OF COLLABORATION IN FAMILY BUSINESSES

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We suggest that when family businesses practice a culture of collaboration, they will operate more efficiently. In this article, we describe what is meant by collaboration and encourage family businesses to create a culture of collaboration within their firm. In addition, we summarize former research and report on

our own research that helps identify what aspects of collaboration are related to high business performance.

What is collaboration? Collaboration allows the concerns of individuals or of groups in a firm to be con-

sidered (Thomas and Kilmann, 2010). The goal of collaboration is to find solutions that satisfy the concerns of these individuals or groups. Collaboration encourages an integrative approach to find solutions to problems, but also creates opportunities to explore new growth. Merging insights from different individuals or groups is another benefit that can be realized from collaboration. “Collaborators are helpful in reaching win-win solutions that provide a long-term resolution to a conflict issue.”

The culture of collaboration is driven by five main forces: (1) fairness, (2) goals, (3) family business functionality, (4) tension, and (5) creating an environment of openness to differences.

(1) Fairness. Fairness in the family business is related to equality of treatment of family members as well as non-family employees. Samara and Arenas (2017) explored how businesses practice fairness in both the workplace and the household, and how those practices influenced the family business success. They concluded that when fairness is practiced in the family business, those firms receive returns in the form of positive business reputation, increased profitability, and sustainability over time.

(2) Goals. Lee and Marshall (2013) found that profit growth was influenced by firms having a goal orientation. Family businesses with a goal of growth, or a goal to have a positive reputation also had stronger profits. They concluded that having a goal orientation in family businesses is related to strong financial performance. Basco (2017) observed that family business goals can be both economic and non-economic in nature. He divided goals into family-oriented or business oriented goals, then into economic or non-economic.



(3) Family business functionality. Neff (2015) found that traits related to high financial performance included: confidence in management, developing a shared vision, professional networking, and promoting organizational development. In our recent research, we explored how satisfied people were in feeling they could turn to people at home and work with problems; were satisfied that others in the family and business accept and support their ideas; were satisfied with how family and business individuals share time together; and if they were satisfied with the outcome when a decision had to be made in favor of what is best for the family versus the family business.

(4) Tension. Tension and conflict in family businesses can stem from the family, the business, or a combination of both. Ultimately, this competition for resources between the family and the business can lead to conflict. Pieper et al. (2013) found three common conflicts that exist in family businesses: (1) using “the business as a family pawn” or bringing business issues up as a means to create family conflicts; (2) “retarding maturation”

or keeping young members of the family from pursuing options other than the family business; and (3) “stagnation” or a resistance to change in the family business

(5) Creating an environment of openness to differences. Culture is very important and influential in how family businesses operate and succeed (Fletcher et al., 2012). We suggest that creating a culture that is open to differences will allow a freer flow of ideas and innovation. In turn, the openness to new ideas and innovation will tend to result in improved business and family outcomes.

Model and Results

In our research, we had data on 601 family business-

es and explored which of these five unique forces of collaboration contributed to success. Two models were constructed to measure which were statistically related to success within the family business. One model was designed to look for the traits that were related to the actual incomes of the 601 businesses and the second looked for traits that influenced the perception of success within the family business.

What We Found

The results for the two models revealed that there are varying motivations for the drivers of family business success. Income of the 601 businesses was positively affected by defining fairness according to the contribution each person makes; by fostering a culture that values differences of opinions; in businesses that have lasted for multiple-generations; and by businesses with more employees (larger).

The perception of success among the 601 owners was statistically and positively affected by defining fairness as treating each person according to their contribution or by treating everyone the same; having higher family functionality, and not having tension over the distribution of family and business resources.

Overall, having components of a culture of collaboration within a family business leads to higher levels of success. Family businesses that define fairness according to contribution of family members and foster a culture of openness to opinions tend to receive higher returns. Family businesses should strive to create a culture of collaboration in order to be more productive and have a healthy work environment for family members and non-family employees.

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