PURDUE AGRICULTURAL ECONOMICS REPORT

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Indiana Land Values Surge!

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Statewide, values of average Indiana cropland increased by 14.2% in the year ending in June 1996, nearly double the 7.4% increase a year ago. According to the Purdue land values survey, this is the ninth consecutive year of increasing Indiana land values. Increases of around 35% were registered in both the first and last third of this 9 year period. There was a lull in the upward trend during the middle 3 years with only a 7% increase over the period. For the entire 9 years, going back to the low level of 1987, statewide top and average cropland values have gained over 90% and poor land has doubled. Even so, 1996 land values are still about 15% below the record levels of 1981.

The number of farmland transfers in the 6 months ending in June compared to a year earlier was estimated to be up by 34% of the respondents versus 31% last year. More land was thought to be on the market now by 16% of the respondents versus 12% a year ago. Land brokers report difficulty in finding top quality land for sale in some areas.

Statewide Land Prices

For the *six months* ending in June 1996, the value of top and average land was reported to have increased 5.2%, and 4.8% for poor quality land (Table 1). Most respondents (78%) reported that some or all classes of land went up from December 1995 to June 1996, compared to two-thirds last year. Only 6 responses indicated that some or all classes of land fell during that period.

The statewide *12 month* increase in average cropland from June 1995 to 1996 was 14.2% (Table 2). Top quality land (149 bushel corn yield

Table 1. Average estimated Indiana land value per acre (tillable, bare land) and percentage change by geographic area and land class, selected time periods, Purdue Land Values Survey, July 1996.

Area	Class	Corn bu/A	Dec. 1995 $	June 1996 $	Change 12/95-6/96 %	Projected Dec. 1996 $	Projected Change 6/96-12/96 %
North	Top	149	2154	2250	4.5	2291	1.8
	Average	118	1562	1626	4.1	1659	2.0
	Poor	88	1095	1155	5.5	1180	2.2
Northeast	Top	148	2026	2117	4.5	2138	1.0
	Average	118	1537	1586	3.2	1601	0.9
	Poor	91	1173	1206	2.8	1211	0.4
W. Central	Top	154	2367	2496	5.4	2577	3.2
	Average	127	1867	1993	6.7	2064	3.6
	Poor	98	1383	1457	5.4	1508	3.5
Central	Top	153	2462	2614	6.2	2689	2.9
	Average	128	2036	2155	5.8	2211	2.6
	Poor	102	1601	1679	4.9	1733	3.2
Southwest	Top	156	2098	2216	5.6	2251	1.6
	Average	122	1524	1611	5.7	1647	2.2
	Poor	91	971	1020	5.0	1033	1.3
Southeast	Top	133	1595	1671	4.8	1714	2.6
	Average	110	1302	1366	4.9	1394	2.0
	Poor	86	1029	1081	5.1	1098	1.6
Indiana	Top	149	2161	2274	5.2	2326	2.3
	Average	121	1677	1765	5.2	1807	2.4
	Poor	93	1243	1303	4.8	1332	2.2
	Trans.[1]		4150	4437	6.9	4638	4.5

1 *Land moving out of agriculture*

rating) was estimated to have increased by $245 per acre to $2274. Average land (121 bushel corn yield rating) was valued at $1765 while the 93 bushel poor land was estimated to be worth $1303 per acre, up more than 18% for the year. In spite of this big increase in poor land, it remains 15% below the 1981 peak, the same as top land.

The land value per bushel of corn yield rating also increased substantially. For top quality land, value per bushel of yield was $15.26, up by 13.5%. Average quality land value was $14.59 per bushel, while the poor quality value was $14.01 per bushel (Table 3). The percentage increase of 18.5 on poor land was noticeably higher than on average and top land. These per-bushel figures are $1.82 higher than last year on top land, $1.93 higher on average land, and $2.19 higher on poor land.

The value of transition land moving into non-farm uses increased less than 1% in the 1-year period ending in June to over $4437 per acre compared to an increase of 10.7% last year (Table 2). Estimates for transition land vary widely from county to county and even within

Table 2. June 1995 and June 1996 average estimated Indiana land value (tillable, bare land) and percentage change by geographic area and land class, Purdue Land Values Survey, July, 1996.

Area	Class	Land Value June 1995 $	June 1996 $	Change 6/95-6/96 %
North	Top	2062	2250	9.1
	Average	1484	1626	9.6
	Poor	993	1155	16.3
Northeast	Top	1828	2117	15.8
	Average	1389	1586	14.2
	Poor	1005	1206	20.0
W. Central	Top	2252	2496	10.8
	Average	1723	1993	15.7
	Poor	1249	1457	16.7
Central	Top	2250	2614	16.2
	Average	1856	2155	16.1
	Poor	1395	1679	20.4
Southwest	Top	2018	2216	9.8
	Average	1433	1611	12.4
	Poor	926	1020	10.2
Southeast	Top	1518	1671	10.1
	Average	1139	1366	19.9
	Poor	837	1081	29.2
Indiana	Top	2029	2274	12.1
	Average	1545	1765	14.2
	Poor	1099	1303	18.6
	Trans.[2]	4420	4437	0.4

2 *Land moving out of agriculture*

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Figure 1. Estimated Indiana Land Value and Cash Rent, Average Land, 1975-1996, Purdue Land Values Survey

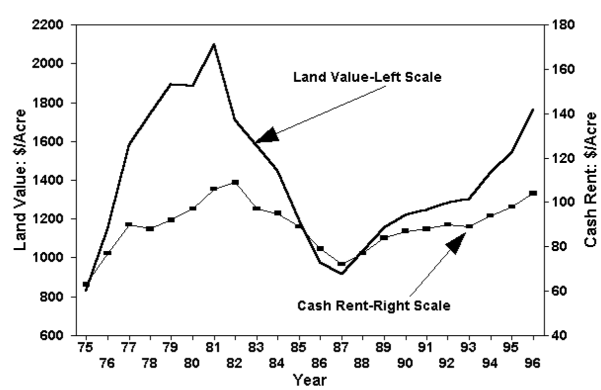


Table 3. Indiana land value per bushel of estimated corn yield, Purdue Land Values Survey, July 1996.

Area	Top 1995	Top 1996	Top % Change	Average 1995	Average 1996	Average % Change	Poor 1995	Poor 1996	Poor % Change
North	$13.75	$15.10	9.8	$12.47	$13.78	10.5	$11.03	$13.13	19.0
Northeast	12.44	14.30	15.0	11.77	13.44	14.2	11.04	13.25	20.0
W.Central	14.53	16.21	11.6	13.46	15.69	16.6	12.74	14.87	16.7
Central	14.61	17.08	16.9	14.61	16.84	15.3	13.81	16.46	19.2
Southwest	13.10	14.21	8.5	11.84	13.20	11.5	10.40	11.21	7.8
Southeast	10.40	12.56	20.8	10.08	12.42	23.2	9.62	12.57	30.7
Indiana	13.44	15.26	13.5	12.66	14.59	15.2	11.82	14.01	18.5

some counties. The median value of individual homesites up to 5 acres and sites of 10 acres or more suitable for residential sub-divisions was the same - $4000 per acre, up from $3500 last year. The percentage increase (14.3%) was about the same as for average tillable land.

Statewide Rents

Cash rents increased statewide from 1995 to 1996 by $7 per acre on top and poor land, and $6 per acre on poor land (Table 4).

The estimated cash rent on average land was $104 per acre, $129 on top land, and $80 on poor land. Rent per bushel of estimated yield was $.87 on top land and $.86 on average land and poor land, up six to eight cents from last year. Cash rent on top land in 1995 was about 6% below the record 1981 level but 42% above the recent low in 1987.

Statewide, cash rent as a percentage of estimated land value declined for the fifth consecutive year. These estimates are 5.7% for top land, 5.9% for average land and 6.1% for poor quality land (Table 4). Greater increases in land values than in cash rents (Figure 1) caused these declines, but the percentages are still higher than the 5% levels of 1979-81.

Table 4. Average estimated Indiana cash rents, bare tillable land, 1995 and 1996, Purdue Land Values Survey, July 1996.

Area	Class	Corn bu/A	Rent/Acre 1995 $	Rent/Acre 1996 $	Change '95-'96 %	Rent/bu. of Corn 1995 $	Rent/bu. of Corn 1996 $	Rent as a % of June Land Value 1995 %	Rent as a % of June Land Value 1996 %
North	Top	149	124	132	6.5	0.83	0.89	6.0	5.9
	Average	118	96	103	7.3	0.81	0.87	6.5	6.3
	Poor	88	70	76	8.6	0.78	0.86	7.0	6.6
Northeast	Top	148	111	118	6.3	0.76	0.80	6.1	5.6
	Average	118	87	95	9.2	0.74	0.81	6.3	6.0
	Poor	91	65	70	7.7	0.71	0.77	6.5	5.8
W. Central	Top	154	139	142	2.2	0.90	0.92	6.2	5.7
	Average	127	114	120	5.3	0.89	0.94	6.6	6.0
	Poor	98	87	94	8.0	0.89	0.96	7.0	6.5
Central	Top	153	132	143	8.3	0.86	0.93	5.9	5.5
	Average	128	110	118	7.3	0.87	0.92	5.9	5.5
	Poor	102	87	94	8.0	0.86	0.92	6.2	5.6
Southwest	Top	156	123	128	4.1	0.80	0.82	6.1	5.8
	Average	122	92	97	5.4	0.76	0.80	6.4	6.0
	Poor	91	66	73	10.6	0.74	0.80	7.1	7.2
Southeast	Top	133	95	98	3.2	0.65	0.74	6.3	5.9
	Average	110	72	77	6.9	0.64	0.70	6.3	5.6
	Poor	86	51	58	13.7	0.59	0.67	6.1	5.4
Indiana	Top	149	122	129	5.7	0.81	0.87	6.0	5.7
	Average	121	98	104	6.1	0.80	0.86	6.3	5.9
	Poor	93	73	80	9.6	0.78	0.86	6.6	6.1

Area Estimates

Increases in the value of farmland by areas (Figure 2) from December 1995 to June 1996 were in the range of 2.8% to 6.7% (Table 1). The only areas that reported greater increases for poor land than for top land were the north and southeast areas.

For the year ending in June 1996 the greatest increase in top or average farmland was in the southeast (19.9% on average land) followed by around 16% increases on top land in the northeast, average in west central Indiana, and top and average in the central areas (Table 2).

Other increases on top and average land ranged from 9.1% to 14.2%. In all areas of the state, poor land value increases were greater than for top quality land. The percentage increase on poor land in the southeast was nearly three times that of top land. Since 1987, topland has increased 97% and poor land 113%. Increases were from the low point the same for top and poor land in the southwest (80%). Values for all classes of land roughly doubled in the west central area (100%). The greatest difference in top and poor land increases since 1987 was the northeast where top land was up 82% and poor land rose 101%.

The highest valued top quality land was the west central and central areas, around $2500 to $2600 per acre. Next highest values were in the north ($2250) and southwest ($2216). Average quality values were $2155 in the central and $1993 in the west central areas but only around $1600 in the north, southwest and northeast. These areas have some land of excellent quality but over-all land productivity is lower than in the central and west central areas. Corn yield ratings were lower by 5 to 10 bushels.

Land values per bushel of estimated average corn yield (land value divided by bushels) on top land were in the range of $15.10 to $17.08 in the north, west central and central areas (Table 3). Top land values per bushel were $14.30 in the northeast and $14.21 in the southwest. The per bushel value of average land in these two areas was about $1 less than on top land. Lowest values, around $12.50, were in the southeast. Land values per bushel tended to decline in all areas as land quality (corn yield estimates) declined. These per bushel values have been increasing since 1987, but are much lower than in 1981 when the per bushel estimate for average land in central Indiana was $21.50. This figure dropped to about $9.50 in 1987 and currently is $16.84.

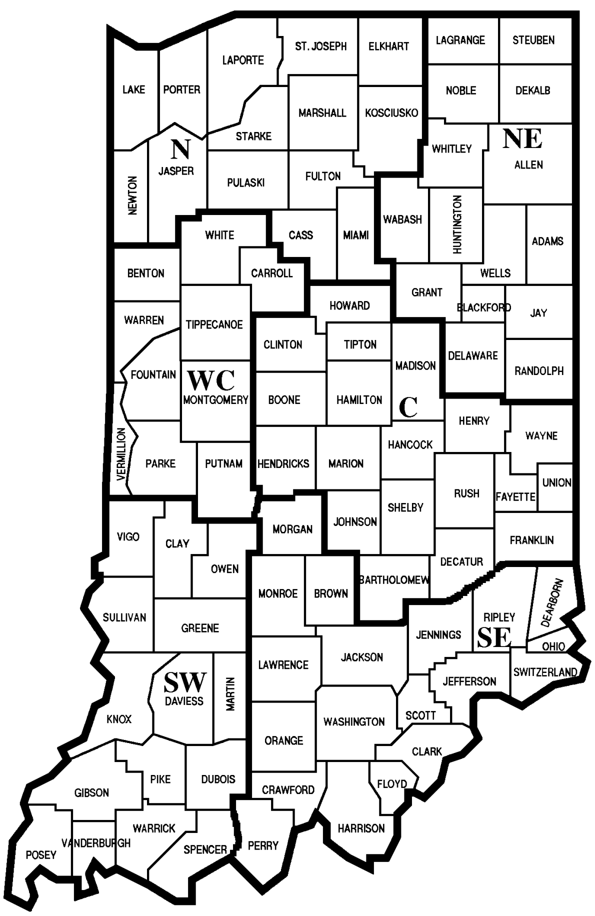
The median value per acre of both small and large homesites was $5000 in the central area, up from the 1995 estimate of $4500 for 5 acres or less and $4000 for tracts of 10 acres or more. In all other areas the median value in 1996 was $4000 per acre for the smaller tracts, up from $3000 a year earlier. The $4000 figure was also reported for the larger tracts in the central and two northern areas, up from $3000 last year. In the southeast, tracts of 10 acres or more had an estimated median value of $3000 this year and last year. The $4100 per acre estimate for 1996 in the southwest was up from $3500 last year.

Cash rents for top land increased by $11 per acre in the central area and $3 to $8 in the other areas. Increases for average and poor land ranged from $5 to $8 (Table 4). The highest percentage increase was for poor land in the southeast (13.7%).

Cash rents were again highest in the west central and central areas - $142 per acre and $143 respectively for top land, $120 and $118 per acre for average land. Cash rents per bushel were also highest in these areas, ranging from 92¢ to 96¢, up 2¢ to 7¢ from last year. The per-bushel rent for top land was 89¢ in the north, 80¢ in the northeast, 82¢ in the southwest, and 74¢ in the southeast. Except in the southeast, these rates were about the same regardless of land quality.

Cash rent as a percentage of land value declined again except on poor land in the southwest. This rate of return on top and average land was in the range of 5.5% to 6.3% in all areas, down from 5.9% to 6.6% in 1995. There was some tendency for the rate to increase as land quality declined.

Figure 2. Geographic Areas Used in the Purdue Land Values Survey



Respondents' Outlook

This is the fifth year in which respondents have become more optimistic than the year before that farmland values would rise by year-end. Seventy-nine percent expect some or all classes of land to increase, up from 53% last year. Only 7% of the respondents expect a decline in values, the same as last year, and 28% expect no change, down from 37% last year. The average expected increase was small in all areas of the state -mostly under 3.5% (Table 1). These projections in the past have been in the right direction but have not been a good indicator of the magnitude of change.

Most respondents (87%) predicted that land values would increase over the next 5 years. Only 7% expected a decline and 6% expected no change. The modest average increase of 11% for the 5 years is two percentage points higher than last year's projection.

Respondents were asked to estimate annual averages over the next five years for corn and soybean prices, the farm mortgage interest rate, and the rate of inflation. The projections they made since 1984 are shown below:

	Prices, $/bu.		Rates, %/yr.	
Year	**Corn**	**Beans**	**Interest**	**Inflation**
1984	$3.13	$7.35	13.3	6.5
1985	2.70	6.13	12.3	5.1
1986	2.32	5.43	11.0	4.2
1987	2.16	5.62	10.7	4.5
1988	2.50	6.82	10.9	4.6
1989	2.48	6.55	11.0	4.7
1990	2.61	6.22	11.0	4.6
1991	2.47	6.07	10.4	4.2
1992	2.52	6.04	9.5	3.8
1993	2.35	5.96	8.7	3.8
1994	2.48	6.18	8.9	3.9
1995	2.50	6.02	9.2	3.7
1996	3.01	6.63	9.1	3.7

This is the fifth year that expected farm mortgage interest rates have remained under 10% and inflation under 4%. Large increases occurred in expected prices of corn and soybeans. This is the first year since 1984 that the expected corn price has been at or above $3 per bushel. Higher farm earnings expectations no doubt have been a major factor in the current and recent strength in the land market. And to the extent that participants in the land market have 5 year expectations of $3 corn and over $6.50 bean prices, further increases in both land values and cash rents likely will occur. Cash rents also will be boosted by substantial government payments in 1997.

Are We Headed for a "Boom and Bust" in Land Values?

Farmland sale prices of $3000 or more are common in parts of Indiana. The question is being raised as to whether land prices may be headed for unrealistically high levels and then suffer a collapse - a repeat of the late seventies and early eighties. There are major differences between the two periods. Inflation and interest rates are much lower now than in the early eighties, farm debt is lower, some of our farm export countries are better able to maintain purchases from us (less external debt, higher incomes), land rent to value ratios are higher, lenders are more cautious and many land buyers paid cash or borrowed conservatively. These differences offer no guarantee against a decline in land values following a couple of years of 10 or 11 billion bushel corn crops. What they do suggest, if there is a decline from present or somewhat higher land values, is that the decline would not be nearly as great as it was in 1981-87. One reason is that recent increases in values have been based mainly (not entirely) on increases in net returns to land rather than on the inflationary expectations of the earlier period. A second reason is that farm land is in much stronger financial hands. As a result, a decline in land values would not result in widespread financial stress severe enough to cause forced land sales and further declines in values.

"The question is being raised as to whether land prices may be headed for unrealistically high levels and then suffer a collapse - a repeat of the late seventies and early eighties."

This is not a time for pessimism but it is a time to reflect on the lessons that should have been learned 15 to 20 years ago.

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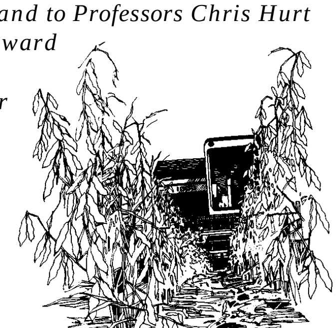
The land values survey was made possible by the cooperation of professional farm managers, appraisers, brokers, bankers, county extension educators, and persons representing the Farm Credit System, the Farm Service Agency (FSA) county offices, and insurance companies. Their daily work requires that they stay well-informed about land values and cash rents in Indiana. The authors express sincere thanks to these friends of Purdue and Indiana agriculture. They provided nearly 400 responses representing most of Indiana's counties. We also express appreciation to Sandy Dottle of the Department of Agricultural Economics for her help in conducting the survey and to Professors Chris Hurt and Howard Doster for their review of this report and helpful suggestions.



More Grains for China by 2000

Lei Zhou, Graduate Assistant
and Philip L. Paarlberg,
Associate Professor

China is the world's largest producer and consumer of agricultural commodities, accounting for 20 percent of world grain production and 30 percent of world pork production. With its size and the rapid per capita income growth following economic reforms, concern has been expressed about the role China will play in global food markets. Projections of Chinese trade have ranged from expectations of modest net exports of grains to imports of almost unimagineable magnitudes. These differences arise from the differing assumptions authors make about future income and output grow. Those projecting net exports assumed relatively strong output growth and healthy income growth. Those seeing large Chinese imports driving world commodity prices higher and leading to starvation in other regions of the world assume shrinking Chinese agricultural land, slowing technological gains, environmental degradation, and rapid income growth with more per capita meat consumption.

This article presents another set of projections for Chinese trade in grains which foresees strong, but not excessive, growth in grain imports by the year 2000. Also, some key assumptions are varied to illustrate just how sensitive the projections are to these forces. These results show that when interpreting projections about Chinese trade, questions need to be raised about the production growth rate, the feed conversion ratios, and changes in human grain consumption assumed by the authors of the study.

Background

In 1978, China introduced a bold reform of its economic system designed to gradually give market forces a greater role in their centrally planned economy. In the past 18 years, many changes have resulted. At first agricultural output rose sharply as farmers were allowed to make their own production decisions and to keep the income they generated in farming. Agricultural output growth exceeded per capita income growth and China became a net exporter in competition with the United States. More recently agricultural output growth has slowed while per capita income growth continued to expand. Real per capita income in 1990 was 3.5 times that of 1978. As consumption expenditure increased during that period, the share of consumers' budgets devoted to food fell, yet remained high. In 1978, 58 percent of spending was devoted to food compared to 54 percent in 1992. From 1978 through 1991, per capita grain consumption rose 2 percent per year and pork consumption (the dominant meat) rose 7.5 percent per year.

Despite the rapid income growth, per capita consumption of agricultural products in China remains behind its ethnic neighbors (table 1). Meat products, at 61 pounds per capita, account for 15 percent of the protein in the Chinese diet. The remaining protein intake comes from grains —633 pounds per capita in 1992. By contrast, Taiwan and Hong Kong consume 147 and 210 pounds of beef, veal, pork, and poultry per capita in 1992. The expectation is that the Chinese diet of the future will look more like those in Taiwan and Hong Kong. This increased meat consumption will raise demand for grains for feed.

Table 1. Per Capita Consumption of Selected Agricultural Products in China, Taiwan, and Hong Kong, 1992

Commodity	China	Taiwan	Hong Kong
		— pounds —	
Pork	49.4	86.6	80.9
Beef/Veal	3.3	5.5	30.0
Poultry	8.4	55.1	99.6
Grain	632.7	925.9	339.5

Source: Calculated from USDA data: Total use divided by population.

Projections of Grain Imports in 2000

To obtain projections for grain imports assumptions about the supply and demand forces in China through the end of the decade are necessary. Once these projections are made import levels can be determined.

A critical issue is grain output growth. The projections in this study use the period 1988 through 1995 which gives an annual growth rate of 2.24 percent. At that rate of growth in the year 2000, total grain production will be 386 million tons (table 2). Starting from the first year of reform in 1978 would give a much higher rate of growth in output, but most experts believe that China cannot sustain that high of growth rate. Following the early reforms there was a surge in output as China tapped unrealized efficiencies. Recent years have shown more modest output growth. Another concern is the urbanization and development are reducing agricultural land, both through conversion and environmental degradation.

The demand side has several forces to project. Of these population is the easiest. By 2000 the Chinese population will be 1.316 billion. Chinese per capita consumption and feed conversion ratios are harder to project. Using the years 1988 through 1992, per capita pork consumption is projected to grow 5.33 percent per year. For beef and veal the growth rate is 15.85 percent, while a growth rate of 14.06 percent is applied to per capita consumption of poultry. These growth rates are conservative compared to the longer 1978-1992 trend. Feed conversion ratios from the U.S. Department of Agriculture by livestock type are used to find the feed needed for the projected livestock consumption. The feed conversion ratios used are 3.88 for pork, 6.32 for beef/veal, and 2.81 for poultry. Based on data from the 1980s, only half of the total feed supply consisted of grains. Thus, the projected feed use is cut in half for a grain demand of 127 million tons (table 2).

Another force is human consumption of grains. In 1995 human consumption was 488 pounds per capita and was falling at 0.7 percent per year. Comparing human per capita grain consumption in Taiwan (304 pounds) and Hong Kong (309 pounds) suggests that a contined decline is reasonable. This gives a human use of 281 million tons (table 2).

Subtracting the projected output from the projected uses gives a gap of 22 million tons which would be imported. This compares to total imports of 15 million tons for 1995. At 22 million tons, China would almost be the world's largest individual country importer with about the import volume of Japan.

Sensitivity of the Projections

Given the widely different expectations over China's future imports, it is useful to change some of the key assumptions and see what difference they make to the results. Three alternative situations are considered. First, the growth rate in grain production is varied. Then technical change in livestock feeding is examined by changing the feed conversion ratios. Finally, the impact of different rates of change in human grain consumption is analyzed.

The base grain production growth rate is 2.24 percent per year. If that rate falls to only 1 percent per year, imports of grains rise to 45 million tons. In contrast, a higher growth rate for grain output of 4 percent per year causes net exports of 12 million tons in the year 2000.

A similar story occurs for changes in feed efficiency. If feed efficiency is allowed to improve by 20 percent for each type of livestock, the projection is that China will export 3 million tons. A livestock feed industry that converts feed into meat 20 percent less efficiently causes imports of grains to rise from 22 to 47 million tons.

The base projections assumed that human per capita use fell at 0.7 percent per year. If a more rapid decline is assumed —2 percent per year— the level of Chinese imports falls from 22 million tons to 4 million. However, if there is no decline in per capita human use imports rise to 32 million tons. And if human use rises 2 percent per year, huge imports of 63 million tons result.

This senstivity analysis suggests that the projected magnitude of Chinese grain imports is very sensitive to the assumptions. While the base projections yield large, but managable imports, a slowdown in grain production growth, a less efficient feed industry, or rising per capita human use sharply raise imports. The unimaginable import projections for China sometimes reported assume all of these forces occur together. On the other hand, these forces operating in the other direction can easily project China to be a net grain exporter in competition with the United States.

Conclusion

China will be one of the major influences on world agricultural markets. This article projects Chinese grain imports for the year 2000 based on recent trends. The base set of assumptions used to project demand and supply suggest that China will be among the largest individual country importers of grains —22 million tons. That level is around the volume of present Japanese imports and is managable without disrupting the world trading sytem.

Projections of Chinese trade have widely differing conclusions. Some forecast net grain exports, while others project imports at levels that would be catastrophic for world food supplies. Sensitivity analysis of the projections in this study can produce either of these scenarios depending on the assumptions made regarding grain output growth, feed efficiency, and human use. Tracking the forces that influence Chinese output and use will be critical in managing the integration of China into world markets.

Table 2. Chinese Grain Supply and Use, 1995 and Projected 2000

Item	1995	Projected 2000
	— million metric tons —	
Output:	346	386
Demand Feed:		
Pork	65[3]	87
Beef/Veal	15[3]	20
Poultry	15[3]	20
Total	95	127
Demand Human:	270	281
Stocks Change:	-5	
Imports (net):	15	22

3 *Estimates based on historic feed consumption patterns.*

Source: Data for 1995 from the U.S. Department of Agriculture.

Just How Important is the Food and Agricultural System in Indiana?

David Broomhall, Extension Economist

Indiana has a long and rich heritage as a major food producing state. While technological change has improved yields and reduced the need for farm labor, consumers are demanding that more processing be done post-farm gate. These changes have had an impact on the structure of the food industry, as jobs and income generation have shifted from farming to food processing. These changes also have geographic consequences, as food processors typically locate in urban areas while farm production remains in rural areas.

"The results presented in this report show that, in 1992 dollars, the food and agricultural system contributes over $16.6 billion in income, or 13.3 percent of the state economy, and over 500,000 jobs, or 17.3 percent of total employment."

The purpose of this report is to measure the impact of the food system on the economy of Indiana, and particularly on rural counties. The report examines all levels of the food system from farm inputs to the grocery store shelf, including all spending that is a direct or indirect result of the production of food. The report begins by looking at the manner in which income flows through an economy and is followed by a discussion of input-output models. The findings of an economic impact analysis of the food and agricultural system in Indiana are then presented.

The Multiplier Effect

Measuring the economic impact of the food industry on the economy of Indiana is not a simple matter. Income generation and spending within an economy is a complex activity. There are three distinct effects that occur as money flows through an economy: direct; indirect; and induced. *Direct effects* are those that benefit a business when it creates value in some product. For example, the farm sector benefits in a direct way when a farmer earns income by growing corn.

There are also *indirect effects* as a result of an increase in business activity. The farmer purchases inputs of seed, fertilizer, equipment, and business services to produce a crop, and the purchase of these inputs contribute to the economy as well. Indirect effects also occur when the output of an industry is used as an input to another industry to add value to a product.

Individuals involved in the production of a good earn income for their efforts. The spending of their earned income on goods and services for consumption creates additional income for others. The generation of income as a result of this spending is called *induced effects*.

The direct, indirect, and induced effects are incorporated into the *multiplier effect*. The multiplier effect is defined as the relationship between some initial change in an economy and the succeeding economic activity that is generated as a result of that initial change. An economic impact analysis is based on the concept of the multiplier effect and traces the spending that occurs as a result of some initial activity, in this case food production and distribution, throughout the economy. These effects can be estimated using an *input-output model*.

Input-Output Models and the Food System

There are various types of input-output models. Input-output models contain sets of equations describing the relationships that link the output of one industry with all other industries in an economy. The U.S. Forest Service has developed a comprehensive input-output model called IMPLAN, which divides an economy into 528 separate industries (Lindall and Olson, 1993). IMPLAN includes data at the county level for all counties in the United States, and these counties can be combined to form regions in any manner desired.

The food system is difficult to define, especially the farm component, because it includes a preponderance of sole proprietors, family laborers, unpaid labor, dual occupational workers, seasonal labor, contract labor, home-consumed products, and government programs that affect income. Since the farm component is linked to other components of the food industry in a backward direction (through the purchase of inputs) and a forward direction (through the sale of products for processing and distribution), it is easy to double count some of the values used. For example, the value of the output of a food processor has the value of the raw farm product imbedded in it. Counting the value of the farm output along with the value of the output of the food processor would count the value of the raw farm output twice. To portray accurately the impact of the food industry it is important to avoid double counting, and this study has gone to great lengths to avoid this problem.

For the purposes of this study, the food system is defined as:

1. all farm output of crops and livestock, including farm management services, and government payments,

2. processing of the above products, including food, tobacco products, and alcoholic beverages,

3. distribution activities including transportation, wholesale, and retail sales of food products, and

4. related input sectors, including all production of goods and services for the farm, processing, and distribution activities above.

This definition is a system-wide definition, which means that all activities which add value to farm products are included, regardless of where the raw products originate.[*] Hence, the processing industry includes the value added to food products purchased from out-of-state producers as well as those from Indiana. Likewise, the distribution industry includes value added to food products produced out-of-state but distributed to Indiana consumers. The value of the out-of-state products themselves is not included, nor is the value added to Indiana farm products processed by out-of-state processors considered in this analysis. It is important to understand that this definition of the food industry likely differs from definitions of similar studies in other states. For this reason the reader is advised to consider carefully how the industry is defined before making comparisons with results from other studies.

The impact analysis is conducted for both the state and a rural subset of the state which includes only those counties considered as being rural[**] (Figure 1). This was done because the economies of rural counties are generally less developed than urban counties, and hence may be more vulnerable to economic downturns in a specific industry, including agriculture.

Impact Analysis of the Indiana Food System

IMPLAN divides the economy into 528 industries, but industries of similar characteristics can be aggregated to simplify the analysis and make presentation of the data and results clearer. The model used in this analysis divides the economy into 41 groups of industries. Table 1 list the impacts by sector. Sectors 1 through 9 are those related to agricultural production; sectors 10 through 15 represent the food processing industries; 16 and 17 represent grocery stores and places that serve prepared foods; 18 and 19 provide inputs primarily for agricultural production; and sectors 20 through 41 represent all other sectors in the economy. The results are presented in terms of value added, which refers to payments made by industries to workers, interest, profits, and indirect business taxes, and

Figure 1. Rural (shaded) Counties in Indiana.

* This definition excludes some industries such as gas stations that sell food items, school cafeteria workers, etc.

** The definition of "rural" and "urban" in this analysis differs from the terms "metropolitan" and "nonmetropolitan" as used by the US. Census Bureau and the US Department of Agriculture. "Urban" in this analysis includes all counties with a population greater than 100,000, or those counties with a population greater than 50,000 and population density greater than 100 persons per square mile. Rural counties are defined as those counties that are not urban.

Table 1. Value Added (in millions of 1992 dollars) and Employment Effects of the Food System for Indiana and Rural Indiana.

Sector Number	Sector	Value Added for Indiana	Value Added for Rural Indiana	Number of Jobs in Indiana	Number of Jobs in Rural Indiana
		— million dollars —			
1	Dairy Farms	70	30	2,347	1,741
2	Poultry And Eggs	131	91	1,732	3,626
3	Cattle	62	54	6,988	2,978
4	Hogs, Pigs, and Swine	122	116	9,196	5,263
5	Other Livestock	2	1	188	65
6	Food Grains	51	47	2,228	1,082
7	Feed Grains	991	414	27,686	7,636
8	Oil Bearing Crops	614	864	20,898	15,387
9	Other Crops	75	39	2,637	748
10	Processed Meat and Eggs	102	54	4,143	2,837
11	Dairy Processing	106	44	1,720	736
12	Grain and Flour Milling	262	15	2,448	188
13	Fats and Oils Processing	68	35	672	297
14	Soft Drinks and Liquor	644	0	3,908	0
15	Misc. Food Processing	846	465	12,795	6,865
16	Food Stores	1,715	586	80,676	27,059
17	Eating & Drinking Places	2,070	641	146,998	46,428
18	Ag., Forest, and Fishing Services	33	21	2,402	1,448
19	Farm Inputs and Machinery	43	8	452	155
20	Horticultural and Nursery	20	17	893	1,496
21	Forest Products	0	0	2	1
22	Mining	5	2	51	29
23	Construction	243	92	6,315	2,310
24	Fabric Mills and Leather	1	0	37	15
25	Misc. Manufacturing	186	79	4,584	1,924
26	Wood and Paper Processing	72	28	1,675	656
27	Petroleum and Chemicals	286	41	3,298	723
28	Glass, Stone, and Clay	37	11	723	222
29	Metal Industries	31	11	499	213
30	Machinery and Equipment	43	20	754	323
31	High Technology Industries	71	31	1,174	551
32	Transportation Equipment	52	18	743	278
33	Transportation and Communication	541	212	11,338	4,608
34	Utility Services and Generation	381	146	2,370	859
35	Wholesale and Retail Trade	1,729	541	54,208	18,513
36	Finance and Real Estate	1,962	679	23,216	6,131
37	Misc. Services	1,025	329	45,575	14,583
38	Recreation and Amusement	113	44	6,324	2,449
39	Health Services	1,432	468	38,187	12,581
40	Education	204	68	8,065	2,988
41	Government	243	87	8,156	3,492
Total		16,685	6,450	548,299	199,486
Percent Attributable to the Food System		13.3%	16.0%	17.3%	19.5%

employment.[***] The estimates provided by IMPLAN are considered conservative when compared to other input-output models (Johnson and Wade, 1994).

Table 1 shows the value added and employment effects for the entire state, and for the rural counties only. Seventy of the 92 counties in Indiana are considered rural. These 70 counties constitute 38 percent of the state's population but 77 percent of the agricultural production. Urban areas have a larger share of value added in food processing, commanding 70 percent of the value added in those sectors combined. Hence it appears that rural areas produce the raw materials, but the processing tends to be in urban areas.

The entire food industry accounts for $16.7 billion in value added and over 548,000 jobs in Indiana. This translates to 13.3 percent of total value added to all goods and services in the state, and 17.3 percent of employment. In just the rural counties the agricultural and food system is somewhat more important, accounting for 16 percent of value added and 19.5 percent of employment. IMPLAN calculates employment as a proportion of income generated in an industry. Those industries which tend to have a greater portion of value added attributed to labor will have a higher jobs to value added ratio. For example, the portion of value added attributed to labor is particularly high in the Eating and Drinking Places industry. The ratio of employment to value added may be high in that industry because of a preponderance of low wage workers, which tends to reduce value added, and part-time workers, which tends to enlarge the employment figures. The farm production industries tend to have higher ratios of employment to value added, implying that much of the value added in agricultural production is attributed to labor. Service industries also typically derive a larger proportion of value from labor. In those industries which derive only a small portion of value added from labor, the ratio will be smaller. The Fats and Oils Processing industry, for example, is highly automated, using very little labor in the production process, and thus has a low ratio of employment to value added. Most manufacturing industries tend to have low ratios of employment to value added.

Summary

The results presented in this report show that, in 1992 dollars, the food and agricultural system contributes over $16.6 billion in income, or 13.3 percent of the state economy, and over 500,000 jobs, or 17.3 percent of total employment. Rural areas of the state are not that much more dependent on the food industry than the state as a whole, with 16.0 percent of value added and 19.5 percent of employment being attributed to the food and agricultural system. The primary difference between the food industry in rural and urban areas is that rural areas typically produce the raw agricultural product, while the processing and refining of these raw goods is performed in urban areas. Since agricultural commodity prices are generally determined by world markets, rural economies are likely to be more vulnerable to changes in world economic and crop conditions than urban economies. The value of the raw agricultural product represents only a portion of the value of the output of food processors, implying that changes in commodity prices will have less of an impact on prices in the food processing industry.

A more detailed version of this report is available. Also, the Center for Rural Development is equipped to conduct economic impact studies of such things as: plant upsizing, downsizing, openings, or closings; cultural or athletic events; or the economic impacts of a particular industry on a local or regional economy. If interested, please call (317)494-4310 for more information. The report is Staff Paper #96-18.

The production of food has been, and continues to be, an important activity in the economy of Indiana. Changes in technology have allowed fewer and fewer people to produce more and more food, freeing up labor to participate in other sectors of the economy, fueling the economic growth that has occurred in the Indiana and U.S. economies for much of this century. It also helps provide American consumers with the lowest food prices of all industrialized countries, allowing us to use our income to purchase other goods and services, which raises our standard of living.

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Lindall, Scott, and Doug Olson. (1993) "Micro IMPLAN User's Guide, Version 91-F." Minnesota IMPLAN Group.

**** IMPLAN measures the number of jobs rather than full-time equivalency, which makes the employment figures in industries with higher proportions of part-time workers (e.g., food services) appear larger than in those with low proportions of part-time workers.*

Alternative Retirement Investments for Farmers

George F. Patrick, Extension Economist and Christine M. Hamaker, former Research Assistant

Many farmers do little formal planning or investing specifically for retirement. Typically, any surplus funds are reinvested in the farm operation with the hope that the farm will provide the necessary retirement income. However, the experiences of the 1980's indicate that wealth held as farm assets is very vulnerable to changes in the agricultural economy. Total equity in farm real estate dropped nearly 40 percent from $686 billion in December 1981 to $422 billion in 1986. Thus, a more diversified investment portfolio may provide a more secure retirement.

Retirement planning for farmers is important for a number of reasons. In farm operations involving more than one generation, farm assets may be inadequate to provide sufficient income for both generations as the retiring farmer's labor input is reduced. The question of "How big a retirement income the farm will provide" is generally an issue. Other farm families may be concerned about outliving the accumulated assets in their retirement portfolio.

This study analyses the effects of alternative retirement investment strategies based on their performance during the 1965 to 1991 period. Although future performance is unknown, the past may be the best indicator available. The study examines the value of the portfolio accumulated for retirement, the level of retirement income generated, and the probabilities of using up or exhausting the accumulated portfolio during a 20-year retirement period. The study is not intended to develop an optimal retirement strategy for farmers or retirement investment strategies for individual farm families. However, the results obtained may be useful guidelines for farm families in their retirement planning.

> ***"The question of "How big a retirement income the farm will provide" is generally an issue. Other farm families may be concerned about outliving the accumulated assets in their retirement portfolio."***

Overview of the Simulation Model

A spreadsheet is used to simulate farm financial performance over a 20-year period of pre-retirement accumulation and a 20-year retirement period in real terms (adjusted for inflation). Based on the initial conditions specified, the model determines farm income, reinvestment necessary to maintain the farm operation, funds available for additional investment, and other variables each year. If funds are available for additional investment, they are allocated as specified in the investment strategies being analyzed. At retirement, current and non-land farm assets are liquidated over three years to reduce taxes, and the farm real estate is cash rented. Social security benefits equal to the average benefits received by a couple in 1993 are included as retirement income. In addition, if there are any other investments, the returns from these investments are also included in their retirement income, and taxes are calculated. If the total after-tax retirement income exceeds necessary loan payments and family living expenses, the excess reduces existing loans or is invested in a money market account. If the total after-tax retirement income does not meet loan repayments and family living expenses, the deficit is drawn from the money market account or by borrowing against other farm and nonfarm assets.

All of the analysis is in real terms, in 1993 dollars. Thus, a dollar received at the end of the 20-year retirement period has the same purchasing power as dollar at the beginning of the 20-year pre-retirement period. The distributions of the current and capital gains portions

Table 1. Retirement Investment Strategies Asset Allocations.

	Investment Allocation					
Investment Strategy	**Tax-deferred investment**	**Farm land**	**Other farm assets**	**Common stocks**	**Bond**	**Mutual funds**
I Farm	——	1/3	2/3	——	——	——
II Tax-deferred	maximum contribution	1/3 of remainder	2/3 of remainder	——	——	——
III Stocks	——	1/3	1/3	1/3	——	——
IV Bonds	——	1/3	1/3	——	1/3	——
V Mutual funds	——	1/3	1/3	——	——	1/3

of the returns used in the model are based on the average returns and the variability of returns experienced during the 1965 to 1991 period. For each year in the simulation, the returns to the various investments are randomly drawn from these distributions. Thus, there could be a series of good or bad years. A total of 500 replications of each strategy are used to obtain information about the range of possible outcomes.

Alternative Retirement Investment Strategies

Five alternative investment strategies (Table 1) are analyzed. All of the retirement investment strategies involve some additional investment in the farm operation if funds in excess of capital replacement needs of the current farm are available. In Strategy I, all available funds are reinvested in the farm operation. One-third is invested in land and the remaining amount is divided, 40 percent for current assets and 60 percent for intermediate assets (listed as Other farm assets). In Strategy II, if available funds permit, the maximum allowable contribution is made into a tax-deferred individual retirement account, IRA or Keogh plan. Any remaining funds are invested as in Strategy I. The last three strategies allocate two-thirds of available funds into farmland and other farm assets as in Strategy I and one-third into common stocks, U.S. bonds, or growth stock mutual funds, respectively.

The averages and variability of the annual current, capital gain, and total returns of the alternative investments for the 1965 to 1991 period are in Table 2. Current returns are the net operating returns from farming, the dividends from stock, and the interest from bonds. Capital gain returns are the changes in the values of the assets, while the total return is the sum of the current and capital gain returns of an investment. Average real current returns varied from 2.25 percent for growth mutual funds to 7.70 percent for U.S. bonds. Average real capital gain returns of whole farm and U.S. bond investments were negative, while growth stocks returned 4.01 percent annually.

Table 2. Mean and Standard Deviation (in parentheses) of Real Annual Current, Capital Gain, and Total Returns of Selected Investments, in Percent, 1965-1991.

Investment	Current	Capital Gain	Total
Whole farm	5.25	-0.09	4.32
	(2.69)	(9.41)	(10.42)
Rented land (landlord)	4.69	0.09	4.79
	(0.69)	(11.40)	(11.34)
U.S. bonds	7.70	-5.94	1.65
	(2.11)	(11.11)	(12.13)
Common stocks	3.88	1.71	5.60
	(0.82)	(15.91)	(16.24)
Growth mutual funds	2.25	4.01	6.11
	(0.78)	(18.88)	(18.83)
Growth and income mutual funds	3.44	1.77	5.21
	(0.68)	(15.23)	(15.05)

Variability is indicated by the standard deviation. If the distribution of returns, say for U.S. bonds, follows the bell-shaped normal curve, then real current returns from bonds would be expected to be in the range of 5.59 to 9.81 percent (7.70%, + or -2.11%) more than two-thirds of the years. The capital gains portion of the returns is much more variable than the current returns portion for all of the investments considered. The current, capital gain, and total returns of agricultural investments were negatively correlated with stocks, bonds, and mutual funds. Thus, an investment split between agricultural and nonfarm investments will have a more stable return than a nondiversified investment.

Base Situation

For this study, a couple, each 45 years old, with assets similar to the average of participants in 1992 Indiana comparative farm business summary is assumed. They plan to

Table 3. Beginning Retirement Portfolios of Alternative Investment Strategies for Farm Families, Base and Alternative (in parentheses) Scenarios.

Investment Strategy	Real Portfolio at Age 65 in $1,000 Mean	St. Dev.	Minimum	Maximum	Probability of Loss over Time
I Farm	677	315	90	1,924	33%
	(970)	(473)	(85)	(3,296)	(18%)
II Tax-deferred	806	402	105	3,020	25%
	(1,111)	(498)	(149)	(3,420)	(13%)
III Stock	693	325	46	2,352	32%
	(992)	(451)	(3)	(2,944)	(16%)
IV Bonds	655	304	-11	1,911	36%
	(935)	(448)	(-10)	(2,986)	(19%)
V Mutual funds	708	336	72	2,173	31%
	(1,007)	(450)	(116)	(2,756)	(15%)

retire at age 65, are not interested in transferring the farm to other family members, and want to maintain an after-tax level of real family living expenditures of about $27,800 per year. Three initial situations, representing different wealth positions, are analyzed. The net worth positions represent three levels of owned acreage: 240, 320, and 400 acres. All farms had debt/asset ratios of 45 percent and $244,845 in intermediate debt. The amount of long-term debt varies with the owned acreage. The net worths are $461,650, $542,610, and $736,000, respectively.

In the base simulation, it is assumed averaged real returns in pre- and post-retirement periods would be the same as real returns had been for the 1965 to 1991 period with the same variability. As noted previously, the real capital gain to land was negative, -0.09 percent annually, during the period. An alternative scenario, with the real capital gain in land values increasing 0.09 percent annually and greater variability of current returns to the whole farm investment, was also simulated.

Simulation Results

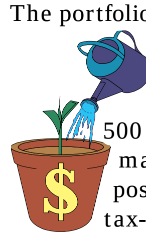
Because results are generally similar, only the middle situation -the 320 owned acres and initial net worth of $543,000 - is presented in Table 3. In the base simulation, on average, all of the investment strategies had growth in real terms over the 20 year period. The largest average portfolio at the beginning of retirement resulted from Strategy II, the tax-deferred investment. The beginning retirement portfolio was almost $100,000 larger than the second place strategy, mutual fund investment (Strategy V), and nearly 20 percent larger than strictly reinvesting in the farm operation (Strategy I). The tax-deferred investment strategy also resulted in both the highest maximum (best) and minimum (worst) ending portfolios. Growth mutual funds performed better than stocks, while bonds (Strategy IV) were the poorest performing investment. The negative minimum value indicates the family would have “gone broke” before retiring in the worst case.

In the alternative scenario simulation, when the variability of current returns to farm operation and real capital gains to farmland are increased, differences among the beginning retirement portfolios from the alternative investment strategies are reduced. This is because farmland is the major asset in all of the portfolios, and land increases in real value over time. The tax-deferred investment strategy continues to provide the largest average portfolio and the largest standard deviation. The farm investment strategy remains at fourth but now is only about 13 percent behind tax-deferred investments. Investment in bonds continues to be the poorest performing portfolio.

The right hand column of Table 3 indicates the probability that the beginning retirement portfolio value, or wealth at age 65, would be less than it was initially at age 45. In the base simulation, the probabilities ranged from 25 percent for Strategy II, tax deferred investments, to 36 percent for Strategy IV, the bond investment strategy. These results imply that if the variability of future investment performance is the same as it was over the 1965-1991 period, all investment strategies have a substantial probability, 25 to 36 percent chance, of losing value in real terms before the farm couple reaches age 65. For the sensitivity analysis, with increased variability of current farm returns and increased real land values, the probabilities of “losing ground” are lower. However, the probabilities still range from 13 to 19 percent.

Value After 20 Years of Retirement

The portfolio performance and ending portfolio value after 20 years of retirement are also simulated 500 times to generate information on the range of possible outcomes. For the tax-deferred strategy, Strategy II, it is assumed that a capital distribution is made each year beginning at age 65. The distribution is calculated by dividing the value of the IRA/Keogh plan at the beginning of the year by the remaining joint life expectancy of the couple. In retirement, it is assumed that all families receive $11,700 in social security benefits annually. If social security and income from rent and investments does not provide $27,800 for family living after taxes and necessary loan repayment, then the couple will borrow against their investment portfolio of farm and nonfarm assets.



The average retirement incomes and ending portfolios for the different retirement investment strategies in the base and alternative scenario simulations are presented in Table 4. None of the investment

Table 4. Ending Retirement Portfolios of Alternative Investment Strategies for Farm Families, Base and Alternative (in parentheses) Scenarios.

Investment Strategy	Mean Income ($1,000)	Real Ending Portfolio Value in $1,000: Mean	St. Dev.	Min.	Max.	Probability of “Running Out”
I Farm	20.8	392	795	-969	5,315	31%
	(27.5)	(899)	(1,290)	(-1,061)	(13,568)	(24%)
II Tax deferred	27.7	782	1,055	-841	8,499	25%
	(34.7)	(1,217)	(1,114)	(-1,282)	(8,852)	(14%)
III Stock	21.2	509	794	-895	3,970	26%
	(28.3)	(1,094)	(1,155)	(-1,063)	(7,742)	(17%)
IV Bonds	20.3	377	812	-1,385	5,341	32%
	(27.0)	(871)	(1,193)	(1,394)	(11,731)	(23%)
V Mutual funds	21.6	559	891	-938	6,199	26%
	(28.3)	(1,122)	(1,180)	(-872)	(7,430)	(17%)

strategies in the base simulation, on average, provide the specified level of family living. Strategy II, the tax deferred IRA/Koegh investment, comes closest, in part because of the capital distribution. However, on average, the tax-deferred investment strategy has the smallest decrease in value over the retirement period. All of the other investment strategies provide average incomes of $20,300 to $21,600 and require the couple to borrow against the assets in their retirement portfolio.

Strategy I, reinvestment in the farm operation, and Strategy IV, investment in bonds, have the largest average reductions in portfolio value during retirement. These investment strategies are the least able to provide for retirement income without invading the principal. Because of the higher real land values in the alternative scenario, all of the retirement investment strategies provide average retirement incomes which are very close to or exceed the $27,800 level of family living. The tax-deferred investment strategy provides the highest level of income, again in part, because of the required capital distribution. However, a comparison of Tables 3 and 4 indicates that the tax-deferred investment strategy portfolio increases in average real value over the 20-year retirement period.

The risk of exhausting the retirement portfolio or "running out" of retirement funds, without changes in family living expenditures, before the end of the 20-year retirement period ranges from 25 to 32 percent in the base simulation. All of the retirement investment strategies involve a majority of farm investments which decline slightly in real value over time. In the alternative scenario, when real land values increase slightly, the probabilities of exhausting the retirement portfolio before the end of 20-year retirement period are reduced. However, even in this case, there is a 14 to 24 percent chance of the retirement portfolio being exhausted.

"Results of this study indicate that diversified retirement investment strategies, especially tax-deferred investments, generally result in larger retirement portfolios and higher retirement incomes than reinvestment of all available funds into the farm operation."

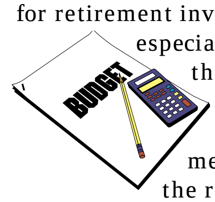
Conclusions and Implications

Results of this study indicate that diversified retirement investment strategies, especially tax-deferred investments, generally result in larger retirement portfolios and higher retirement incomes than reinvestment of all available funds into the farm operation. In the base simulation, which involved a slight decrease in real land values, none of the investment strategies provide the specified level of family living, on average, without some borrowing against assets for the farms starting with 240 and 320 owned acres. Only the tax-deferred retirement strategy provided the specified level of family living for the farm starting with 400 acres. The reinvestment in farm assets strategy led to average beginning retirement portfolios of $674,000, $806,000, and $932,000, before contingent tax liabilities, for the farms starting with 240, 320, and 400 owned acres, respectively. These retirement portfolios, which are equivalent to net worth, are substantial by most standards yet do not allow the retired couple "to live off of the income from the farm."

There is a substantial chance, 25 to 40 percent in the base simulation, that the real value of the investment portfolio will decline during the 20-year pre-retirement accumulation period. In some instances the value of the portfolio at the beginning of retirement is negative, suggesting that the couple is bankrupt. However, the model does not allow withdrawal from farming, part or full-time nonfarm employment by one or both spouses, or other responses which farm families might make when faced with deteriorating economic conditions.

The probabilities of exhausting the retirement portfolio over the 20-year retirement period range from 25 to 32 percent in the base simulation. The variability associated with the current returns and capital gains in the agricultural sector over the 1965 to 1991 period was very large. Both the run-up in land values and high farm incomes of the 1970's as well as the drastic decline in land values and negative incomes of the 1980s are included. A more stable period would result in less extreme values, on both the high as well as the low side. However, even with more optimistic assumptions about farm land values, the probability of "running out" or exhausting the retirement portfolio over a 20 year period is always 12 percent or higher.

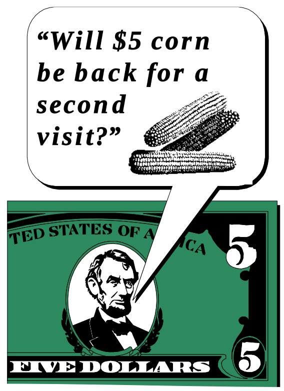
This study emphasize the need for retirement investment planning, especially with respect to the beneficial effects of tax-deferred retirement investments. Furthermore, the results also suggest the need for farm families to plan their retirement income and expenses. Many farm families will need to consider significant changes in family living expenditures, delayed retirement, or other responses in retirement to avoid exhausting their retirement portfolio.



Attend Your Ag Outlook Update

Many are asking the fundamental question of whether 1996 will eventually be viewed as the exceptional year, or whether it is simply the first year in an entirely “new era in agriculture.” The record high corn prices left nearly everyone considering the financial progress they could have made if they had just held on to their corn crop. What about the year to come? Record late planting has put the Indiana corn crop in jeopardy once again? Will $5 corn be back for a second visit? Inflation is back in the news...will it come roaring back? How much increase in land values and cash rents does the Purdue Land Values Survey indicate for your area, and what will happen next year?

The Purdue Cooperative Extension Service will conduct Agricultural Outlook Updates throughout the state in September and December. These programs will cover the outlook for the year ahead for the general economy, AG policy, international trade, grains, soybeans, cattle, hogs, land values, and business strategies. Meetings are currently scheduled for September and December in the following counties. Please check with your county Extension Office for details.



September Scheduled Counties
Adams, Allen, Bartholomew, Benton, Cass, Clay, Clinton, Decatur, Elkhart, Fayette, Franklin, Fulton, Grant, Greene, Hamilton, Hancock, Howard, Huntington, Johnson, Kosciusko, LaGrange, Martin, Montgomery, Newton, Owen, Porter, Posey, Pulaski, Rush, Shelby, Steuben, Sullivan, Warrick, Wayne, Wells, White, and Whitley

December Scheduled Counties
Carroll, Clark, Crawford, Harrison, Lawrence, Orange, Scott, and Washington

IN THIS ISSUE

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