PURDUE AGRICULTURAL ECONOMICS REPORT

Sources of and Responses to Risk: Have Crop Producers' Opinions Changed?

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Participants in the 2003 Top Farmer Crop Workshop were asked to complete a questionnaire asking about the sources of risk which they face in their farming operation and about their responses to these risks. Most participants in the Top Farmer Crop Workshop are full-time, commercial producers, and their farm operations may involve multiple operators. Although Workshop participants are not a statistically representative sample of farmers, to the extent that these producers have characteristics that will be typical of commercial producers in the future, their views and behavior provide useful information to both other producers and those serving the agricultural sector.

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** For a discussion of some additional surveys of the Top Farmer Crop Workshop participants see George Patrick, "How Producers View Risk and Consultants: 2001 Top Farmer Crop Workshop Survey Results," **Purdue Agricultural Economics Report**, February 2003, p. 6-8. This is available at www.agecon.purdue. edu/extension/pubs/paer/2003/paer 0203.pdf.*

This article reports some results from the 1997, 2001 and 2003 surveys. The 1997 survey was taken shortly after the "Freedom to Farm" Act was passed and commodity prices were relatively high. The 2001 survey was conducted when commodity prices were low, the government was providing substantial emergency assistance and there was considerable uncertainty before passage of the 2002 Farm Security and Rural Investment Act.

The 2003 survey reflects the environment of the new farm policy. Because of differences in the policy and economic environment at the time of the surveys, producers may have had differences in their views about sources and responses to risk.*

A total of 42 responses were obtained in 2003 from Workshop participants. The average respondent was 44.3 years of age, had completed 15.3 years of education, and operated 2,501 acres of cropland in the U.S. (up from 1,988 and 2,283 acres for participants in the 1997 and 2001

surveys, respectively). Of the cropland, 39.0% was owned, 19.3% was share leased, 32.9% was cash rented and 8.8% was custom farmed. The portion of owned land in 2003 was considerably higher than the 22.9% in the 1997 survey or the 25.4% in the 2001 survey. This sharp increase probably reflects the relatively small sample size rather than any significant change in land ownership by producers. The 1997 and 2001 samples were similar in age and education to the 2003 sample. Nearly 40% of the respondents produced some specialty crops under contract. Given the emphasis on crops in

Table 1. Averages and Standard Deviations of Ratings of Importance[1] of Risk Sources for the Top Farmer Workshop Participants, 1997, 2001, and 2003[2,3]

Sources of Risk (Changes in…)	1997 N=41		2001 N=39		2003 N=42	
	Ave.	Stand. Dev.	Ave.	Stand. Dev.	Ave.	Stand. Dev.
Government commodity programs	3.20[b]	0.88	4.38[a]	0.67	4.19[a]	0.77
Environmental regulations	3.73[a]	0.78	3.72[a]	0.89	3.79[a]	0.98
Crop yield variability	4.49[a]	0.68	4.08[b]	0.74	4.43[a]	0.77
Crop price variability	4.61[a]	0.63	4.31[b]	0.80	4.60[a]	0.59
Input costs	3.90[a]	0.80	4.13[a]	0.70	4.02[a]	0.98
Land rents	3.95[a]	0.89	3.71[a]	1.18	4.12[a]	1.04
Costs of capital items	4.12[a]	0.75	3.66[b]	0.84	4.17[a]	0.80
Business arrangements with output purchasers	3.46[a]	1.00	3.43[a]	1.01	3.61[a]	0.89
Business arrangements with input suppliers	3.15[a]	1.01	3.14[a]	1.01	3.43[a]	0.98
Credit availability	3.44[a]	1.18	2.92[b]	1.11	3.55[a]	1.09
Technology	3.80[a]	0.81	3.56[a]	0.79	3.76[a]	0.82
Interest rates	3.63[a]	1.03	3.41[a]	1.07	3.67[a]	1.10
Injury, illness, or death of operator	4.10[a]	1.16	3.82[a]	1.17	3.90[a]	1.14
Family relationships	3.68[a]	1.33	3.13[a]	1.44	3.85[a]	1.31
Family health concerns	3.88[a]	1.08	3.64[a]	1.06	3.90[a]	1.08
Family labor force	3.41[a]	1.14	2.82[a]	1.19	3.40[a]	1.15
Average (16)	*3.81[a]*	*0.49*	*3.65[a]*	*0.48*	*3.88[a]*	*0.55*

1   *Importance was evaluated on a Likert-type scale of 1 (not important) to 5 (very important).*

2   *Average values for the importance of a source of risk in different years with the same superscript are not statistically different.*

3   *Analysis includes only respondents with greater than $100,000 in gross farm income.*

the Workshop, it is not surprising that nearly 70% of respondents had no livestock. Less than 8% of the operations were debt-free, while 25% reported 40% debt or more.

Sources of Risk

Producers were asked to indicate the importance of the sources of

risk in their farm decision making on a Likert-type scale of 1 (not important) to 5 (very important). Table 1 summarizes the responses of participants in the 1997, 2001 and 2003 surveys in terms of the average and standard deviation for each source of risk as well as the overall average. The standard deviation is a measure of the variability of the responses, with a larger standard deviation indicating greater variability in opinions of producers responding. Because of the variability of producers' opinions, many of the changes in Table 1 are not statistically significant. Differences in the average values for different years which have the same superscript letter are not statistically different. For example, the average value of 3.20 for government commodity programs in 1997 is statistically different from 2001 and 2003, but there is no significant difference between 2001 and 2003. Considering the average of all of the responses, 2001 was lower than 1997 or 2003, but the difference was not statistically significant.

The six highest rated sources of risk in 2003 and their ratings in other years are summarized in Figure 1. In 2003, the most important source of risk for respondents was crop price

Figure 1. Sources of Risk for Crop Producers, '97, '01 and '03
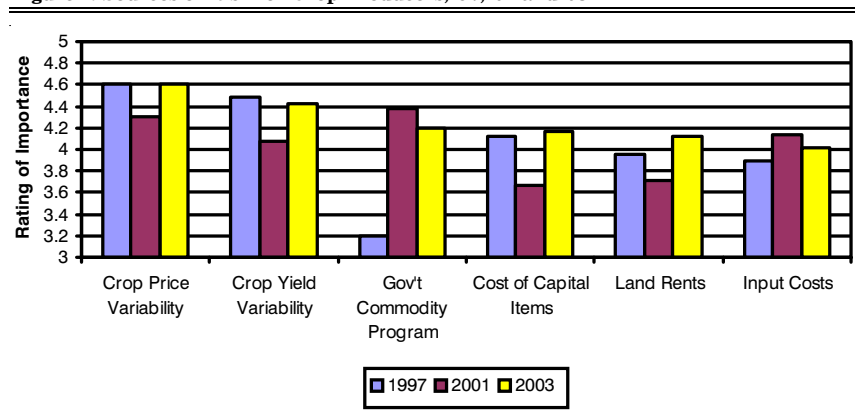
variability, at 4.60. This was almost identical with the 1997 rating and significantly higher than the 4.31 in 2001 when price variability ranked third. Crop yield variability was the second ranked source of risk at 4.43 in 2003. Again, this was similar to 1997 but significantly higher than 2001. Changes in the government commodity program at 4.19 in 2003, was not significantly different from the 4.38 in 2001 but was much higher than the 3.20 that this source rated in 1997. Costs of capital items (4.17) and land rents (4.12) moved up between 2001 and 2003, but only the change in the costs of capital items was statistically significant. Input costs, rated at 4.02 in 2003, was the only other source of risk rated at more than 4.0 in 2003.

The other sources of risk in Table 1 all rated at 3.90 or less in 2003 and most of the changes between years are not statistically significant. The largest standard deviations, indicating the widest ranges of producers' opinions, involved changes in family relationships, family labor force and the injury, illness or death of the operator. As indicated previously, many operations involved multiple family members which typically would result in more concern about farm related family concerns. Other operations may not have family involvement; making farm related family issues of little concern.

Responses to Risk

Producers were asked to indicate the importance of various strategic responses to risk in their farm decision making on a Likert-type scale of 1 (not important) to 5 (very important). The averages and standard deviations of responses are presented in Table 2. There

were no significant differences in the overall average rating of the responses in the three years. Producers were also asked to indicate whether they used each response on their farm. The number and percentage of producers using the various responses are indicated in Table 3.

The six highest rated responses to risk in 2003 and

their ratings in other years are summarized in Figure 2. Producer participation in the government commodity program (4.46) was the highest rated response to risk in 2003, much higher than the 3.49 this response rated in 1997, although the percentages of producers actually participating in government programs were similar for all three years. Being a low-cost

Table 2. Averages and Standard Deviations of Ratings of Importance[4] of Risk Management Responses for the Top Farmer Workshop Participants, 1997, 2001, and 2003[5,6]

Risk Management Responses	1997 N=41		2001 N=39		2003 N=42	
	Ave.	Stand. Dev.	Ave.	Stand. Dev.	Ave.	Stand. Dev.
Diversification of farm enterprise	3.44[a]	0.98	3.71[a]	1.02	3.63[a]	0.94
Geographic dispersion of production	3.15[a]	0.99	2.83[a]	1.08	2.97[a]	1.04
Having backup management/labor	3.76[a]	1.04	3.36[a]	0.90	3.28[a]	1.11
Using production techniques which work under a variety of conditions	4.10[ab]	0.74	3.69[c]	0.89	4.15[a]	0.95
Being a low cost producer	4.15[a]	0.96	4.35[a]	0.75	4.29[a]	0.90
Government program participation	3.49[b]	1.12	4.50[a]	0.73	4.46[a]	0.67
Hedging the selling price of crops	3.78[a]	0.94	3.87[a]	0.99	3.33[b]	1.07
Using a marketing consultant	3.15[b]	1.17	3.68[a]	1.25	2.98[b]	1.08
Using a written marketing plan	3.29[a]	1.15	3.26[a]	1.08	3.14[a]	1.20
Forward contracting the selling price of crops	4.32[a]	0.72	4.21[a]	0.74	4.17[a]	0.83
Minimum price contracts for the selling price of crops	3.15[a]	0.99	2.62[a]	0.91	2.63[a]	1.18
Producing some specialty crops under contract	3.02[a]	1.37	2.97[a]	1.42	3.20[a]	1.31
Commodity options to place a floor under the selling price of crops	3.24[ab]	1.14	3.55[a]	0.98	2.95[b]	1.20
Disability insurance	3.02[a]	1.08	2.92[a]	1.11	2.83[a]	1.16
Multiple peril crop insurance (APH, GRP)	2.78[a]	1.26	2.81[a]	1.24	3.41[a]	1.38
Revenue insurance (CRC,GRIP)	NA	--	3.45	1.22	3.61[a]	1.41
Hail and fire insurance for crops	2.90[a]	1.18	2.51[a]	1.07	2.61[a]	1.41
Health insurance	4.27[a]	0.90	4.03[a]	1.05	4.00[a]	1.02
Life insurance for operator/key personnel	3.98[a]	0.96	3.62[a]	1.21	3.68[a]	1.15
Liability insurance	4.54[a]	0.87	4.21[a]	1.09	4.27[a]	0.95
Maintaining financial/credit reserves	4.05[a]	0.77	3.58[b]	1.03	3.44[b]	0.98
Off-farm investments	2.98[a]	1.11	3.26[a]	1.09	2.83[a]	1.20
Off-farm employment	2.20[a]	1.30	2.39[a]	1.44	2.33[a]	1.34
Debt-leverage management	3.66[a]	1.11	3.50[a]	1.06	3.40[a]	1.35
Buy/sell agreements among owners	3.10[a]	1.39	2.67[a]	1.36	3.03[a]	1.23
Prenuptial agreement regarding business assets	2.56[a]	1.29	1.78[a]	0.98	NA	--
Average of 20 responses	*3.47[a]*	*0.44*	*3.44[a]*	*0.55*	*3.44[a]*	*0.55*

4 *Importance was evaluated on a Likert-type scale of 1 (not important) to 5 (very important).*

5 *Average values for the importance of a response to risk in different years with the same superscript are not statistically different.*

6 *Analysis includes only respondents with greater than $100,000 in gross farm income.*

Table 3. Number and Percentage of Top Farmer Workshop Participants Using Risk Management Responses in 1997, 2001 and 2003[7]

Risk Management Responses	1997	N=34	2001	N=39	2003	N=34
	No.	Percent	No.	Percent	No.	Percent
Diversification of farm enterprise	20	58.8	23	59.0	14	47.1
Geographic dispersion of production	16	47.1	15	38.5	12	35.3
Having backup management/labor	16	47.1	14	35.9	13	38.2
Using production techniques which work under a variety of conditions	28	82.4	23	59.0	26	76.5
Being a low cost producer	23	67.6	26	66.7	23	67.6
Government program participation	30	88.2	33	84.6	31	91.2
Hedging the selling price of crops	23	67.6	24	61.5	20	58.8
Using a marketing consultant	18	52.9	24	61.5	13	38.2
Using a written marketing plan	11	32.4	17	43.6	8	23.5
Forward contracting the selling price of crops	32	94.1	32	82.0	30	88.2
Minimum price contracts for the Selling price of crops	9	26.5	5	12.8	5	14.7
Producing some specialty crops under contract	16	47.1	16	41.0	18	52.9
Commodity options to place a floor under the selling price of crops	17	50.0	21	53.8	13	38.2
Disability insurance	11	32.4	12	30.8	9	26.5
Multiple peril crop insurance (APH, CRC, RA, IPP and GRP)	19	55.9	28[8]	71.8	28[9]	82.4
Hail and fire insurance for crops	18	52.9	10	25.6	13	38.2
Health insurance	29	85.3	27	69.2	28	82.4
Life insurance for operator/key personnel	32	94.1	24	61.2	25	73.5
Liability insurance	32	94.1	29	74.4	28	82.4
Maintaining financial/credit reserves	24	70.6	19	48.7	15	44.1
Off-farm investments	19	55.9	21	53.8	16	47.1
Off-farm employment	13	38.2	10	25.6	10	29.4
Debt-leverage management	19	55.9	17	43.6	12	35.3
Buy/sell agreements among owners	9	26.5	14	35.9	9	26.5
Prenuptial agreement regarding business assets	5	14.7	5	12.8	NA	--

[7] *Analysis is limited to producers indicating use of at least one of the risk management responses.*

[8] *Of the 39 producers, 8 used only yield insurance, 14 used only revenue insurance, 6 used both and the remaining 11 producers used neither.*

[9] *Of the 42 producers, 5 used only yield insurance, 10 used only revenue insurance, 13 used both and the remaining 14 producers used neither.*

Figure 2. Responses to Risk by Crop Producers, '97, '01 and '03

producer, forward contracting the selling price of crops, using production practices that work under a variety of conditions and having liability and health insurance were responses to risk that all rated at 4.0 or more in importance (Table 2). In spite of the importance given to these responses, use by producers was less than 100%.

Forward contracting continued to be the highest rated marketing response, with nearly 90% of producers forward contracting at least some of their production. The importance given to hedging the selling price of crops and using commodity options to place a floor under prices both declined from 1997 to 2003. During the same period, the importance given to using a marketing consultant increased sharply from 1997 to 2001 and then declined even more by 2003. These changes were reflected to a lesser degree in the percentages of producers using consultants. The importance given to using a written marketing plan was flat over the period. There was some increase in the percentage of producers indicating that they used a written marketing plan from 1997 to 2001, but the percentage in 2003 was lower than in 1997.

Among the insurances considered, only liability and health insurance rated at 4.0 or higher. The importance given to multiple peril crop insurance increased from 2.78 in 1997 to 3.41 and use increased from about 55% to over 80%. However, the increase in importance was not statistically significant largely because of the large standard deviations which indicate there is a wide range of opinions about crop insurance among producers. Over this time period, insurance products and premium subsidies were expanded considerably.
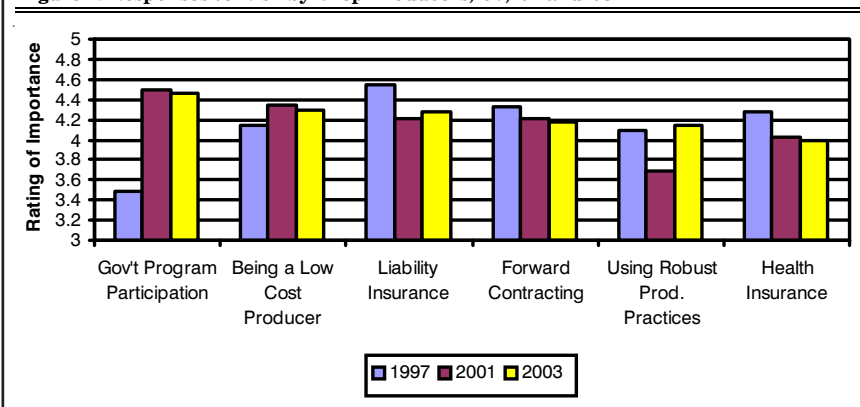
Among the financial responses, the importance given to both maintaining financial/credit reserves and debt-leverage management declined from 1997 to 2003, but only the decline in maintaining reserves was statistically significant. The percentage of producers indicating use of these responses also declined. In some instances, producers indicated that they were unable to practice a response because of economic conditions.

Conclusions

Producers' opinions of the importance of various sources of risk in their farm decision making have changed some, but not radically from 1997 to 2003. Concerns about price and yield variability are almost always the primary concerns of crop producers. Government commodity policy, costs of capital items, land rents and input costs also rated above 4.0 on the 5-point scale of importance as sources of risk. Ratings of strategic responses to risk have also changed some. Participating in the government commodity program and using crop or revenue insurance have increased in importance in managing risk, while less importance is given to hedging, minimum price contracts and use of options. Of course, the government commodity program (i.e. loan deficiency payments and counter cyclical payments) is equivalent to a no-cost minimum price contract or put option contract for participating producers. Thus, producers may be choosing to rely on the government commodity program rather than using price management tools offered by the market for a fee. Looking forward, there will be a new Farm Bill in 2007 which may or may not offer the same level of price protection as the 2002 Farm Bill. If the 2007 Farm Bill does not offer as much price protection, producers may return to using hedging, minimum price contracts or options contracts.

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2003 Small Business Indicators

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Small businesses are a major part of the Indiana economy. In Indiana, 97.5% of the businesses are characterized as small businesses and small businesses make up 99% of the businesses in the U.S. (U.S. Dept. of Commerce).* The majority, 85%, of the firms in Indiana have less than 20 employees. Non-employer firms constitute 10% of all the firms in Indiana while firms with 1-4 employees and 5-19 employees make up 44% and 31% of total businesses, respectively.** Small businesses are an important part of the Indiana economy and integral to job creation. Understanding their development is a way for us to determine how the economy is moving.

The economic indicators for small businesses in Indiana were positive for 2003. Farm and non-farm proprietor income rose above the national average and business bankruptcies continued to decline. Self-employment increased in Indiana while it decreased in Illinois, Kentucky, Michigan, and Ohio. However, all five states had a higher rate of firm terminations than formations.
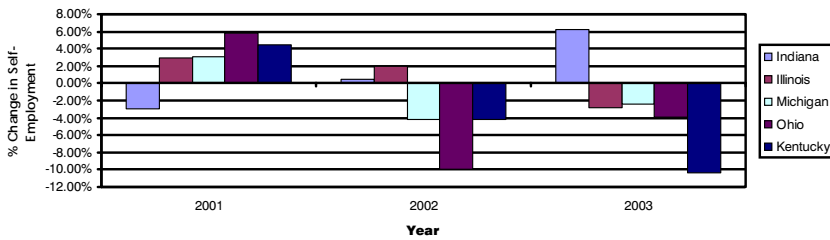
This article provides a brief overview of various economic indicators for small businesses in Indiana. A comparison between Indiana, Illinois, Kentucky, Michigan, and Ohio is also provided. The following sections contain a discussion on self-employment, business turnover, and the outlook for small businesses.

Self-Employment

Nationally, non-farm proprietor income and farm proprietor income from 2002 to 2003 rose 5.6% and 36.4%, respectively. Proprietor income in Indiana rose from $11.8 billion in 2002 to $13.2 billion in 2003 an 11.5% increase. This 11.5% increase ranked Indiana 8th in the Nation. Whereas, Indiana's closest neighbors Illinois, Kentucky, Michigan, and Ohio were

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* The Small Business Administration (SBA) defines small businesses as those with less than 500 employees which make small businesses an important component of the U.S. economy.

** A non-employer business is one that has no paid employees, has annual business receipts of $1000 or more and is subject to federal income taxes.

Figure 1. Change in Self-Employment in Indiana, Illinois, Kentucky, Michigan, and Ohio, 2001-2003

Source: U.S. Small Business Administration, Office of Advocacy

ranked 13th, 14th, 31st, and 10th, respectively. Indiana was rank of 39th with a wage-and-salary income increase of 1.8% in 2003 (SBA, Office of Advocacy).

Self-employment nationally rose 3.7% in 2003 from 9.9 million in 2002 to 10.3 million in 2003. The number of self-employed in Indiana rose from 194,000 in 2002 to 206,000 in 2003 a 6.2% increase. This was the largest increase in self-employment since the surge in 1995. Unemployment in Indiana rose 1.2% in 2001 and 0.7% in 2002, but declined 0.1% in 2003. Employment declined in industries such as manufacturing leisure (1.2%). These same industries experienced a 0.4%, 1.9%, and 1.7% increase in Indiana, respectively.

Figure 1 shows the percent change in self-employment

for Indiana, Illinois, Kentucky, Michigan, and Ohio from 2001 to 2003. Indiana was ranked 21st in the nation above Illinois (43), Kentucky (50), Michigan (40), and Ohio (45) (SBA, Office of Advocacy). Of the five states, Indiana was the only one to have an increase in self-employment in 2003. Illinois, Kentucky, Michigan, and Ohio all had decreases in the number of self-employed.

It is unclear whether self-employment is "pushed" or "pulled" by unemployment (Lin, Yates, and Picot 1999). Several studies have shown that there is a positive relationship between self-employment and unemployment (Schuetz 1998; Acs, Audretsch, and Evans 1994; Alba-Ramirez 1994). In other words, an increase in the unemployment rate is normally followed by an increase in

self-employment. However, there are also studies that show the opposite. Studies by Taylor (1996) and Blanchflower and Oswald (1998) have shown that unemployment may actually have a negative impact on self-employment as individuals are less likely to try self-employment when economic conditions are unfavorable and the likelihood that their business will succeed is small.

Business Turnover

Business turnover is a combination of employer firm formations and terminations as well as business bankruptcies. Employer firms are those businesses with one or more paid employees. A high level of business turnover does not in and of itself indicate poor economic conditions since we experienced a high business turnover rate in the late 90s during a period of economic expansion.

The number of employer firms rose an estimated 0.3% nationally in 2003. The number of employer firms in Indiana increased in 2003 by 0.4% after experiencing a decrease of 0.4% in 2002. The number of employer firms in Kentucky, Michigan and Ohio decreased in 2003 by 7.1%, 0.4% and 0.5%, respectively, while Illinois experienced a 1.1% increase in the number of employer firms (SBA, Office of Advocacy).

Although the number of firms in Indiana increased in 2003, the number of firms that closed outpaced the number of firms that started (see figure 2). An employer firm formation rate of 10.8% and an employer firm termination rate of 12.1% ranked Indiana 35th and 37th in the nation, respectively (SBA, Office of Advocacy). Comparing the number of firm formations and terminations in Indiana to those

Figure 2. Rate of Employer Firm Formations and Terminations in Indiana, Illinois, Kentucky, Michigan, and Ohio, 2003
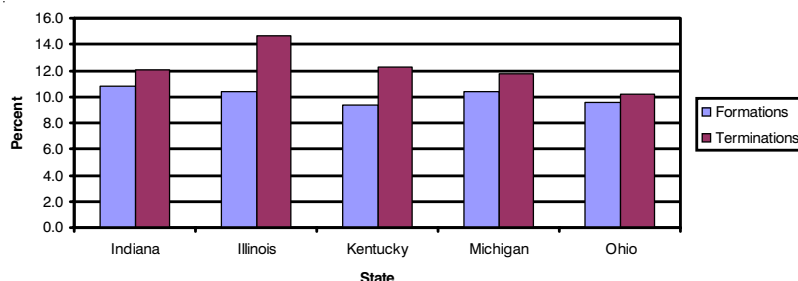
Source: U.S. Small Business Administration, Office of Advocacy, from U.S. Department of Commerce

of Illinois, Kentucky, Michigan, and Ohio, one can see that all five had a higher rate of employer firm terminations than employer firm formations. Illinois suffered the worst with an employer firm formation rate of 10.4% and a employer firm termination rate of 14.7% (SBA, Office of Advocacy).

Business bankruptcies in Indiana increased by 9.4% and totaled 661 in 2002. In 2003, business bankruptcies decreased by 3.2% and totaled 640. Business bankruptcies have been decreasing nationwide since 1990 and in 2003 they decreased by 9.1% (SBA, Office of Advocacy). The number of business bankruptcies from 1999 to 2003 for Indiana, Illinois, Kentucky, Michigan, and Ohio are shown in figure 3.
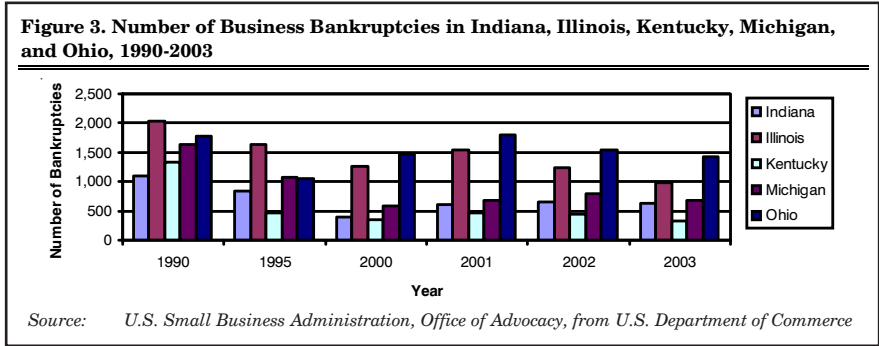
Small Business Outlook

According to the National Federation of Independent Business, the national outlook for small business growth remains good. The Small Business Optimism Index© (based on a national survey of small and independent business owners) was at an all time high in December of 2003 at 106.9 (1986=100). This year began with the index at relatively high levels compared to the previous five years and continued the 18-month trend of readings above 100 (see figure 4). In September 2004 the index hit 104.5, a 1.6 point increase from August.

In September 2004, 23% of the small businesses surveyed indicated that they thought the next three months were a good

*** *The Small Business Survival Index 2004 can be found at www.sbecouncil.org.*

**** *Property tax as a share of personal income.*

Figure 3. Number of Business Bankruptcies in Indiana, Illinois, Kentucky, Michigan, and Ohio, 1990-2003

Source: U.S. Small Business Administration, Office of Advocacy, from U.S. Department of Commerce
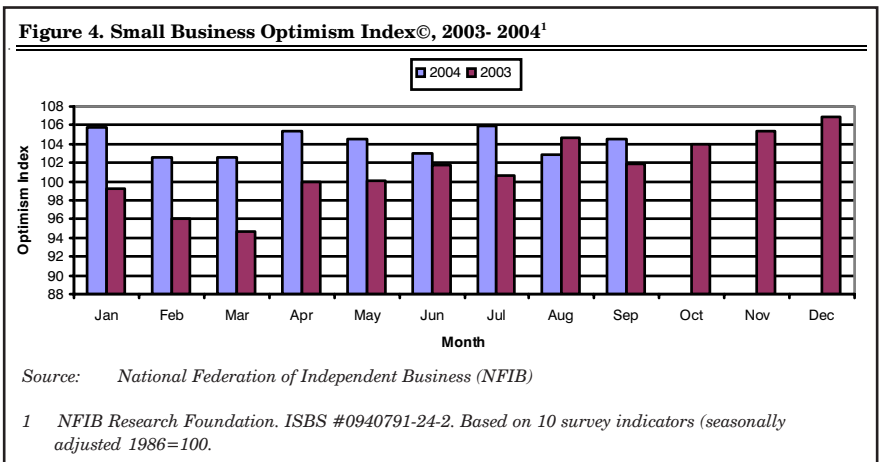
time to expand. This was a 4% increase from August. The top two reasons that the next three months were a good time for expansion were 1) economic conditions and 2) sales prospects. However, 35% of the small businesses surveyed indicated that the next three months would not be a good time for expansion and the top three reasons were economic conditions, the cost of expansion, and political climate. Of the small business owners surveyed in September, 36% indicated they expect a better economic outlook for the next 6 month, a 4% increase from August (Dunkelburg and Wade 2004).

Indiana was ranked 10th in the Small Business and Entrepreneurship Council's *Small Business Survival Index 2004*.*** This index ranks states according

to their policy environment toward small businesses. This would indicate that Indiana is one of the top ten states in which to have a small business. Illinois, Kentucky, Michigan, and Ohio were ranked 19th, 29th, 6th, and 40th, respectively. Indiana is among the states with the lowest rates for person income and capital gains taxes. However, it is among the states with the highest corporate income tax rates and state and local property tax rates.****

Summary

Small businesses in Indiana seem to be recovering. Self-employment had a significant increase in 2003 almost double the national average. Proprietor income rose 11.5% and ranked Indiana 8th in the nation. However, the firms

Figure 4. Small Business Optimism Index©, 2003- 2004[1]

Source: National Federation of Independent Business (NFIB)

1   NFIB Research Foundation. ISBS #0940791-24-2. Based on 10 survey indicators (seasonally adjusted 1986=100).

closing are outnumbering those that are forming. The number of business bankruptcies decreased in 2003 but Indiana was still ranked 18th in the nation. This is still an improvement over 2002 when Indiana was ranked 15th and 2001 when it was ranked 1st with a 52% increase in business bankruptcies. According to the NFIB small business survey, 36% of small business owners expect the economy to improve and 23% think the next three months are a good time for expansion.

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Sources of Risk for Hog Producers and Their Responses*

Amy Peiter, George Patrick, Alan Baquet, Keith Coble and Tom Knight

What risks do hog producers face? How do hog producers respond to risk?

The current risk environment is a challenging one for hog producers. Changes in the industry have forced producers to reevaluate their business and management practices. Risk management is receiving increased attention. However, there is limited information regarding hog producers'

perceptions of risks they face and the effectiveness of risk management strategies. This paper examines these issues drawing on data obtained from a survey of hog producers in Indiana and Nebraska supported by a grant from the USDA's risk management education initiative.

Survey Procedures

In the spring of 2000, hog producers in Indiana and Nebraska were surveyed as part of a risk management education study. The sample of producers was a stratified random sample of producers. The percentage of producers included in the sample was higher for producers with larger hog operations to obtain sufficient representation of large-scale producers. Operations involved only in the ownership of hogs, rather than direct hog production, were excluded. Producers selected for the study were initially mailed a questionnaire with a cover letter. A second questionnaire was sent to non-respondents about three weeks after the initial mailing. Finally, telephone calls were made to the non-respondents to solicit their participation. A substantial number of operations indicated that they no longer were involved in hog production. Excluding those operations resulted in a response rate of

Table 1. Distribution of Responses by State and Size of Operation

Size of Operation (Number of Head)	Indiana	Nebraska
100 to 999	80	81
1,000 to 1,999	109	134
2,000 to 4,999	98	63
over 5,000	43	22
Total	330	300

about 27%. The number and size, measured as the larger of the number of hogs owned or hogs on the operation, of the 630 respondents are indicated in Table 1.

Producers' Perceptions of Sources of Risk

Producers in the sample were asked rate sources of risk in terms of their potential to affect the operation's income from hogs on a 5-point scale (1=low, 5=high). The distribution of responses, average rating and whether there are statistically significant differences by size of operation or by state are indicated in Table 2. The top-rated sources of risk are summarized in Figure 1. Of the 14 sources of risk considered, producers perceived hog price variability, with a mean rating of 4.28, to have the greatest effect on their hog operation's income. There was no statistically significant difference by size of operation; but, as indicated by the "IN higher" in the state effect column, Indiana producers rated price variability significantly higher than Nebraska producers. Other risk sources in Figure 1 which were rated moderately high were changes in environmental regulations, 3.92; disease in hogs, 3.90; market access (having a place to sell hogs), 3.71; and changes in input costs, 3.66. Environmental regulations have become prevalent in the production of hogs, with changes necessitating expenditures to

Table 2. Ratings of Importance of Potential for Various Risk Sources to Affect Income of This Operation.

Risk Source	Low 1	2	3	4	High 5	Average Score	Size Effect[1]	State Effect[2]
Changes in government farm programs	18.3	23.9	27.7	19.0	11.1	2.81	NS	NS
Changes in environmental regulations	4.5	6.9	17.6	34.0	37.1	3.92	S larger	IN higher
Disease in hogs	4.0	8.5	18.0	32.5	37.0	3.90	S larger	NS
Variability in performance of hogs *(weather, genetics, feed quality, etc.)*	5.4	16.4	32.9	34.8	10.5	3.29	NS	NS
Hog price variability	2.9	3.8	10.5	27.5	55.3	4.28	NS	IN higher
Changes in input costs *(feed, medications, etc.)*	3.0	8.9	28.3	38.4	21.3	3.66	NS	NS
Possibility of an environmental accident	24.3	27.6	22.5	17.3	8.3	2.58	S larger	IN higher
Possibility of a contractor failing to fulfill the terms of the contract	48.5	18.4	14.5	10.5	8.1	2.11	S larger	NE higher
Labor/personnel	33.1	25.1	22.7	13.1	6.1	2.34	S larger	NS
Changes in arrangements with those who purchase your production	13.3	10.0	26.6	33.0	17.1	3.31	S larger	NS
Changes in social or community acceptance of hogs	16.4	17.5	28.5	26.0	11.5	2.99	S larger	IN higher
Market access *(having a place to sell hogs)*	8.6	9.6	17.4	31.4	33.0	3.71	NS	NS
Changes in attitude of lenders	22.0	20.3	25.6	22.4	9.7	2.77	S larger	NS
Changes in demands on management due to changes in structure and/or technology	14.4	22.2	37.9	21.2	4.3	2.79	S larger	NS

1 An NS indicates that the size effect is statistically non-significant. If there is a significant size effect, the producers with the higher mean scores are indicated.

2 An NS indicates no statistically significant difference in means between states. If there is a statistically significant difference, the state with the higher mean is indicated.

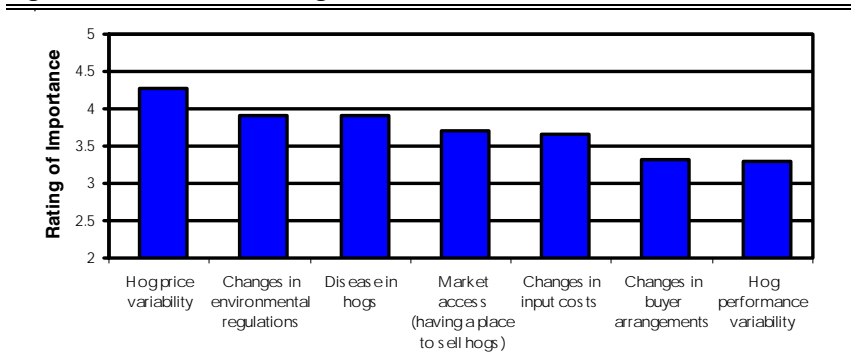**Figure 1. Sources of Risk for Hog Producers**

Table 3. Ratings of Effectiveness of Various Risk Management Strategies in Reducing Risk in this Operation.

Risk Management Strategies	Rating of Effectiveness (%)					Average Score	Size Effect[3]	State Effect[4]
	Low 1	2	3	4	High 5			
Diversifying farming *enterprises (e.g., crops and livestock)*	9.2	9.5	24.3	35.4	21.7	3.51	S smaller	NS
Specializing in hogs only	24.8	31.1	23.7	13.1	7.4	2.47	S larger	NS
Specializing in one phase of hog production *(e.g. finish only)*	25.6	26.6	26.1	14.0	7.6	2.51	NS	NS
Hedging the price on all or part of hog production with futures or options	17.1	17.6	32.8	25.7	6.8	2.87	NS	NS
Use a market contract with a packer	19.3	17.7	32.3	23.2	7.6	2.82	S larger	NS
Contracting all or part of purchased hog feed requirements	12.1	16.6	33.3	30.6	7.4	3.05	S larger	NS
Producing pork under a production contract *(including "for fee" arrangements)*	26.7	23.4	25.7	17.2	7.0	2.54	NS	NS
Being involved in value-added pork production	14.5	15.9	27.9	29.3	12.4	3.09	NS	NS
Having non-farm investments	14.3	11.0	27.7	31.1	15.9	3.23	S smaller	NS
Having off-farm employment	30.3	18.2	20.2	19.7	11.6	2.64	S smaller	NS
Maintaining financial/credit reserves	5.1	7.7	27.0	40.3	19.9	3.62	S larger	IN higher
Maintaining good herd health	2.1	1.9	10.1	40.1	45.7	4.26	NS	NS
Being a low-cost producer	2.5	4.3	12.8	35.3	46.0	4.17	S larger	NS

3 An NS indicates that the size effect is statistically non-significant. If there is a significant size effect, the producers with the higher mean scores are indicated.

4 An NS indicates no statistically significant difference in means between states. If there is a statistically significant difference, the state with the higher mean is indicated.
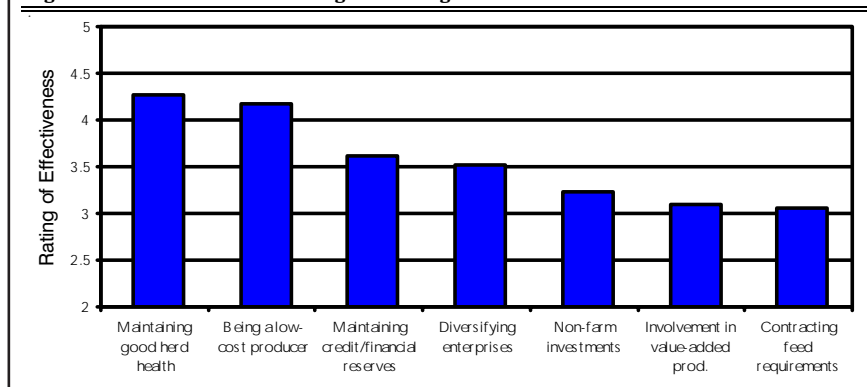
ensure hog operations are in compliance. In Table 2, the "S larger" in the size effect column indicates that larger scale producers were more concerned about the environmental regulations than smaller hog operations and Indiana producers were more concerned than Nebraska producers. Disease may have a major effect on an operation's sole source of income as some diseases may require depopulation of the operation. Thus, it is understandable that producers rated disease as one of the top sources of risk. Again, larger scale producers rated disease higher than smaller scale producers, but there was no difference between states. Size and location did not affect the ratings of market access or input costs. Larger scale producers gave a higher rating to changes in the arrangements with purchasers of their production, but there was no difference between states. Size and location did not affect the 3.29 rating of variability in hog performance.

The other sources of risk all rated less than 3.0 on the 5-point scale. The possibility of a contractor failing to fulfill the terms of a contract rated the lowest at 2.11. This low rating probably reflects the small percentage, about 12%, of producers involved with production contracts. However, larger scale producers and those in Nebraska gave this a significantly higher rating. Labor and personnel concerns also rated quite low at 2.34, with larger producers giving a higher rating. Larger scale producers and producers in Indiana gave higher ratings to the possibility of environmental accidents and the changes in social or community acceptance of hogs than smaller scale producers or producers in Nebraska.

Producers' Perceptions of Effectiveness of Risk Management Strategies

Producers were also asked to rate the effectiveness, on a 5-point scale (1=low, 5=high), of 13 management strategies in reducing risk in their hog operation. The distribution of responses, average rating and whether there are differences by size or location of the operation

Figure 2. Effectiveness of Strategies for Hog Producers

are summarized in Table 3. Producers rated two risk management strategies as highly effective (over 4.0), five risk management strategies were rated moderately (3.0 – 3.9) effective, and six strategies were rated as relatively ineffective (less than 3.0).

The two strategies rated highly effective were maintaining good herd health and being a low-cost producer, with average ratings of 4.26 and 4.17, respectively. These strategies relate directly with the top sources of risks affecting the operation, disease in hogs and input costs. Location did not affect these ratings, but larger scale producers gave greater importance to being a low-cost producer. Other top risk management strategies shown in Figure 2 and their mean ratings were maintaining financial/credit reserves, 3.62; diversifying farming enterprises, 3.51; and having non-farm investments, 3.23. The strategies of being involved in value-added pork production, 3.09, and contracting feed requirements, 3.05, were the only other strategies rated over 3.0. Smaller hog operations gave greater importance to diversifying farming enterprises and having off-farm investments than larger scale operations. Larger scale producers gave higher ratings to maintaining credit/financial reserves and to contracting purchased feed requirements. Location affected only the Indiana producers' ratings for maintaining reserves.

Those strategies rated as relatively unimportant (under 3.0) were hedging hog production with futures and options, 2.87; use of marketing contracts with packers, 2.82; having off-farm employment, 2.64; producing pork under production contracts, 2.54; specializing in one phase of hog production, 2.51; and specializing in hogs only, 2.47. Location did not have an impact on these ratings. Larger scale producers gave higher ratings to specialization in hogs and use of market contracts with a packer than smaller scale producers.

Conclusions

Relatively little information is available regarding hog producers' perceptions of the risks which they face and the effectiveness of various risk management strategies. Given the extremely low prices faced by producers in 1998 and the variability of prices, it is not surprising that hog price variability was the top-rated source of risk. Environmental regulations, disease in hogs and market access were other highly rated sources of risk. Use of production contracts by producers responding to the survey was quite limited and the possibility of a contractor failing to fulfill the terms of the contract was the lowest rated source of risk. Large-scale hog producers tended to rate several of the sources of risk higher than the smaller scale producers. There were similar results for location, with Indiana producers rating several sources of risk higher than Nebraska producers. Several of these higher ratings of sources of risk appear related to Indiana's greater population density and the potential adverse impact on hog producers.

Of the risk management strategies, only maintaining herd health and being a low-cost producer were rated above 4.0. Both directly relate to highly rated sources of risk. Several of the strategies rated as effective were financially related, indicating that producers perceive financial management as an important aspect of their operation. Use of a market contract with a packer and producing pork under a production contract were rated at 2.87 and 2.54, respectively. These ratings put them among the strategies which producers considered least effective in reducing risk.

Overall, the results of this survey are not surprising. Results are consistent with the views of many producers and others involved in the hog industry. However, confirmation of these opinions and understanding of differences among producers provides insights which can aid those working with hog producers to be more effective.
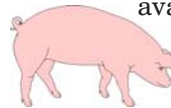
Amy Peiter (Row 1 l) is a Farm Loan Officer, in the USDA, Farm Service Agency at Macon, MO and former graduate student at Purdue University; George Patrick (Row 1 r) is a Professor in the Department of Agricultural Economics at Purdue University; Alan Baquet (Row 2 l) is an Associate Vice Chancellor in the Institute of Agriculture and Natural Resources at University of Nebraska; Keith Coble (Row 2 r) is an Associate Professor of Agricultural Economics at Mississippi State University; and Tom Knight (Row 3) is a Professor in the Department of Agricultural and Applied Economics at Texas Tech University.

Hog Producers' Views of Policy Alternatives*

George Patrick, Amy Peiter, Alan Baquet, Keith Coble and Tom Knight

Hog producers have seen countless changes in their industry. The disastrously low prices for market hogs in late 1998 caused many producers to exit the industry, and sparked interest in a number of possible government policies to assist producers. This study examines hog producers' agreement or disagreement with the following five possible government policies.

1. Mandatory price reporting by all packers.

2. Facilitate development of value-added producer cooperatives.

3. Development of a revenue insurance program.

4. Provide a minimum price guarantee.

5. Government taking an active role in controlling hog supplies.

Table 1. Distribution of Responses by State and Size of Operation		
Size of Operation	Number of Operations	
(Number of Head)	Indiana	Nebraska
100 to 999	80	81
1,000 to 1,999	109	134
2,000 to 4,999	98	63
over 5,000	43	22
Total	330	300

This article also reports the results of an analysis of the effects that characteristics of the producers and their hog operations have on their views of these policies.

Survey Procedures

In the spring of 2000, hog producers in Indiana and Nebraska were surveyed as part of a risk management education study. The sample of producers was a stratified random sample of producers. The percentage of producers included in the sample was higher for producers with larger hog operations to obtain sufficient representation of large-scale producers. Operations involved only in the ownership of hogs, rather than direct hog production, were excluded. Producers selected for the study were initially mailed a questionnaire with a cover letter. A second questionnaire was sent to non-respondents about three weeks after the initial mailing. Finally, telephone calls were made to the non-respondents to solicit their participation. A substantial number of operations indicated that they no longer were involved in hog production. Excluding those operations resulted in a useable response rate of about 27%. The number and size, measured as the larger of the number of hogs owned or hogs on the operation, of the 630 respondents are indicated in Table 1.

Views on Policy Statements

Producers were asked to indicate their agreement or disagreement with a series of policy related statements based on a 5-point scale (5=strong agreement,

3=not sure and 1=strong disagreement). The statements and the distribution of producers' responses are presented in Table 2. Because of the stratified sampling procedure and differences in the response rates among size groups, the results in Table 2 do not represent the average of all hog producers in the industry. Over 41% of respondents indicated strong agreement with the statement that mandatory price reporting by all packers should be required and only 14% of respondents disagreed or strongly disagreed. Producers responding generally expressed disagreement or strong disagreement with the other policy related statements. The average value of the 5-point scale indicates that the government taking an active role in controlling hog supplies was the least popular policy alternative for producers. Providing a minimum price guarantee through government payments, having a revenue insurance program for hog producers, and facilitating development of value-added producer cooperatives all scored less than 3.0 on the 5-point scale.

Factors Affecting Policy Views

A number of characteristics of the hog producers and the hog operations (Table 3) were used to attempt to explain the differences in producers' views on the policy related statements. The average or mean age of producers was about 47 with a range from 20 to 78. Hog operations responding averaged 7,640 hogs produced per year with a range in size from 50 to 300 thousand head. The average

operation had 29.6% debt and had 0.38 crop acres per hog produced. A low value for crop acres per hog produced suggests the hog enterprise is important to the operation.

Several of the characteristics of the producer and the hog operation were treated as "dummy" variables which are assigned a value of one if the trait is present and zero if it is not. Education is an example of such a variable which takes the value of one if the respondent had at least some college education. The 0.618 in Table 3 indicates that 61.8% of respondents had at least some college education. About 92.5 % of the operations sold market hogs and 11.4% were involved in production contracting. Risk aversion, takes a value of one if the producer indicated a 4 or 5 as a response to the scale for this variable. About 32% of producers indicated a willingness to accept a lower market hog price to avoid price variability. A 5-point scale was used to allow producers to express their concern about the effect of price risk and market access on their income and the averages were 4.31 and 3.75, respectively. Finally, a dummy variable took the value of one if the producer was located in Nebraska to attempt to account for differences in opinions due to geographic location.

Logit Model Results

Individuals indicating agreement or strong agreement with a policy statement were assigned a one, individuals who were not sure, disagreed or strongly disagreed were assigned a zero, and a logit model was estimated for each policy statement. Unlike ordinary least squares regression, the estimated coefficients in the logit models do not reflect the change in the dependent variable

(agreement or disagreement with a policy statement) based on changes in the independent variables (producer and operation characteristics). The marginal effects of the independent variables are computed and

reported in Table 4. The marginal effects represent the change in the probability of agreement with a policy statement associated with one unit change in the dependent variable. Marginal effects in bold are computed from

Table 2. Agreement and Disagreement with Selected Agricultural Policy Statements

Statement as in Questionnaire	Percentage Distribution of Responses					
	Strongly Agree 5	Agree 4	Not Sure 3	Disagree 2	Strongly Disagree 1	Mean Score
Mandatory market hog price reporting by all packers should be required.	41.4	34.2	8.7	8.8	5.2	4.01
The government should facilitate development of value-added producer cooperatives.	9.6	26.9	17.6	27.2	18.8	2.81
A revenue insurance program for hog producers should be developed by the government.	8.9	23.2	17.0	26.9	24.0	2.66
A minimum price guarantee for pork producers should be provided through government payments.	15.3	13.5	9.3	28.3	33.6	2.49
The government should take an active role in controlling hog supplies.	7.2	11.4	6.7	31.1	43.5	2.08

Table 3. Summary of Independent Variable Definitions and Values

Independent Variables	Mean	Std. Dev.	Min.	Max.
Age of the respondent in years	46.95	10.19	20	78
Education - equal to 1 if respondent had completed at least some college	0.618	0.49	0	1
Total hogs (1,000) produced (farrowed, grown or finished) in 2000	7.640	19.49	0.05	300
Percent debt - percent of total investment in operation which is borrowed	29.6	23.3	0	100
Type of operation - equal to 1 if involved in farrow-to-finish or growing/finishing phases of production	0.924	0.27	0	1
Crop/hog ratio - acres of cropland in operation divided by number of hogs produced	0.379	0.89	0	18
Production contracting - equal to 1 if any production will be from animals not owned by the operation	0.114	0.32	0	1
Risk aversion – equal to 1 for producers indicating 4 or 5 (high) willingness to accept a lower market hog price to reduce price risk	0.320	0.47	0	1
Price risk – response on a scale from 1 (low) to 5 (high) on potential for hog prices to affect the operation's income.	4.31	0.96	1	5
Market access – response on a scale from 1 (low) to 5 (high) for a change in market access (having a place to sell hogs) to affect the operation's income	3.75	1.23	1	5
State – equal to 1 if the producer is located in Nebraska	0.467	0.499	0	1

coefficients that were statistically different from zero in the logit models. Results for the government taking an active role in controlling hog supplies are not included as results were not statistically significant.

"This survey of hog producers in Indiana and Nebraska indicates there are considerable differences in producers' views of policies which could affect hog producers."

Age of the operator had a consistently negative effect on all of the policy related statements analyzed, but it was only statistically significant for the guaranteed minimum price policy. In that case, a 50-year old producer would be about 4.4% less likely to indicate agreement with the guaranteed minimum price policy than a 40-year old producer. Producers with at least some college education are generally likely to indicate agreement with the policy statements than producers with high school educations or less. The effect was statistically significant only for facilitating value-added cooperatives. The size of the operation, total hogs produced, was consistently negative and statistically significant for three of the policy statements. This indicates that larger producers are less in agreement with the policy statements than the smaller producers.

Operations with larger percentages of debt were less likely to indicate agreement with either mandatory price reporting or guaranteed minimum prices and the effects were statistically significant. This is somewhat of a surprise as one would expect producers with a higher level of debt to be more concerned about risk than producers with less debt. However, producers with higher levels of debt were more likely to agree with revenue insurance and facilitating development of value-added cooperatives.

The type of operation is a dummy variable equal to one if the producer is involved in farrow-to-finish or a finishing phase operation (selling market hogs) and zero for other producers. Surprisingly, the operations involved in selling market hogs were much less likely to agree with all of the policy statements. Producers selling market hogs would be almost 17% and 24% less likely to agree with mandatory price reporting and guaranteed minimum prices, respectively, and these variables were statistically significant. Although the type of operation variable was not significant in the other models, these consistently negative effects are contrary to initial expectations. One possible explanation is that producers feel that implementation of these policies would have a negative impact on the price of market hogs. Thus, they may be viewed with disfavor by those involved in farrow-to-finish and finishing operations.

The crop/hog ratio tends to measure the relative importance of the crop operation, but does not have a consistent or statistically significant effect on policy views. This is the only independent variable which does not have a statistically significant impact in at least one of the models estimated.

Those producers involved with production contracts, producing at least some hogs which they do not own, have a greater probability of agreeing with all of the policy statements; however, the effect is statistically significant only for revenue insurance. One might expect a producer involved in production contracts to be less concerned about the policy statements than independent producers. However, these

Table 4. Estimated Marginal Effects of Independent Variables on the Probability of Producers to Agree with Policy Statements[1]				
Variable	Mandatory Reporting	Guaranteed Minimum Price	Facilitate Value-Added Cooperatives	Revenue Insurance
Age	-0.243	**-0.439**	-0.290	-0.323
Education	2.329	-2.851	**9.700**	1.1678
Total hogs	**-0.875**	**-0.877**	-0.432	**-0.538**
Percent debt	**-0.171**	**-0.166**	0.115	**0.155**
Type of operation	**-16.771**	**-24.262**	-11.436	-10.336
Crop/hog ratio	0.347	-4.189	2.876	-1.950
Production contract	1.624	9.223	1.359	**13.523**
Risk aversion	-5.374	-0.987	4.307	**10.459**
Price risk	**3.729**	**4.943**	**7.913**	**6.792**
Market access	**3.101**	-0.289	0.355	-0.247
State	1.301	5.139	6.158	**10.276**

1   *Marginal effects in bold are computed from statistically significant coefficients.*

producers may have entered into production contract arrangements because of their concern about lack of policies of these types. Alternatively, they may be quite risk averse and view production contracts as providing price protection that would not be offered by government policies.

A producer's willingness to accept a lower price to avoid price variability (risk aversion) has mixed effects on agreement with policy statements. More risk averse producers are significantly more likely to support revenue insurance. They are also more likely to support facilitating value-added producer cooperatives, but the effect is not statistically significant. Contrary to expectations, more risk averse producers did not tend to support market price reporting and guaranteed minimum prices.

A producer's concern about the effect of price risk on income of the operation has a positive and significant effect on all of the policy statements. Concern about market access (i.e., having a place to sell hogs) is statistically significant only for the mandatory price reporting policy statement. Finally, the state variable distinguishes between producers in Indiana and Nebraska. Nebraska producers are more likely to agree with all of the policy statements than Indiana producers, but the effect is statistically significant only for the revenue insurance policy.

Conclusions

This survey of hog producers in Indiana and Nebraska indicates there are considerable differences in producers' views of policies which could affect hog producers. There was strong support for mandatory price reporting and a policy of this type has been implemented since the survey was conducted. Other policies were much less popular with producers, with none of them exceeding 3.0 on the 5-point scale (5= strong agreement and 1=strong disagreement). A gross margin insurance product and price insurance product have been developed and are available for hogs on a pilot basis in a number of major hog producing states.

The analysis suggests that, other than concern about price risk, none of the characteristics of the producers and their operations have statistically significant effects on agreement with all of the policy statements. Concern about price risk leads to support for all of the potential policies. Older producers and those with larger hog operations are less supportive of the potential policies. This may reflect resistance to change by older producers. Larger-scale producers may feel that they do not need to rely on the government or anticipate problems with government managed programs. Producers with farrow-to-finish or finishing operations tend to be less supportive of policy statements. In contrast, producers involved in production contracts tend to agree with the policy statements. Producers in Nebraska are more in agreement with the policy statements than Indiana producers. Nebraska producers are significantly more likely to support revenue insurance than Indiana producers. Smaller-scale producers, producers who are concerned about price risk, and producers who are risk averse are more likely to support revenue insurance and can be targeted in future educational efforts. Some educational activities are currently being undertaken on the pilot livestock risk protection (LPR) program for hogs.

George Patrick (Row 1 l) is a Professor in the Department of Agricultural Economics at Purdue University; Amy Peiter (Row 1 r) is a Farm Loan Officer, in the USDA, Farm Service Agency at Macon, MO and former graduate student at Purdue University; Alan Baquet (Row 2 l) is an Associate Vice Chancellor in the Institute of Agriculture and Natural Resources at University of Nebraska; Keith Coble (Row 2 r) is an Associate Professor of Agricultural Economics at Mississippi State University; and Tom Knight (Row 3) is a Professor in the Department of Agricultural and Applied Economics at Texas Tech University.

New Faculty

Jennifer Dennis is an Assistant Professor and Extension specialist in the area of Specialty Crop Marketing. Jennifer has a joint appointment in Horticulture & Landscape Architecture and Agricultural Economics. Her goal is to assist small horticultural businesses adopt and utilize a better understanding of marketing principles. Her primary focus is specialty crops and direct marketing. Jennifer's research generally focuses on consumer perceptions and behavior of horticultural consumers. Her dissertation work has examined the effect of plant guarantees on consumer's intentions to repurchase after a dissatisfying and/or

Dr. Jennifer Dennis

regretful experience. Her work has also examined the role of emotions (regret) as a mediator to switching. Other research interests includes repeat patronage, consumer perceptions of

products, marketing of organic products, and the organization and implementation of consumer awareness programs for Indiana grown fruits and vegetables. Dr. Dennis is also active in the development and delivery of programs through the New Ventures Team, the Small Farms Team, and the Vegetable Working Group. Jennifer also teaches HORT 435-Principles of Marketing & Management for Horticultural Businesses as well as the capstone course Horticulture 445-Strategic Analysis of Horticulture Production & Marketing in the fall and spring semester respectively.