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REPORT OF SURVEY ON FINANCING HEDGED
CROPS IN EAST CENTRAL ILLINOIS

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REPORT OF SURVEY ON FINANCING HEDGED
CROPS IN EAST CENTRAL ILLINOIS^{a/}

Kim S. Harris & C. B. Baker

EXECUTIVE SUMMARY

This report summarizes results from a survey designed to determine the lending policies of banks and production credit associations in a 26 county area in east central Illinois with regard to farmers who hedge their crop production. The survey was to see if hedging aids the farmer in borrowing money, and if there is a relationship between size and type of credit agency and the likelihood of a positive credit response to hedging.

Findings from the survey are based on 145 responses, 44.2 percent of lenders who received the questionnaire. Thirteen more lenders responded but reported no farm customers. One additional response was not sufficient for analysis. More than half the 145 respondents (77) said they had loaned to farmers who pledged hedged corn and/or soybeans as collateral. Sixty-eight indicated how hedging affects credit.

About 70 percent of those respondents (48) said they would loan more on hedged than on non-hedged crops. Eighteen percent (14) reported loans to hedged farmers that would not have been made had the applicant not been hedged. However, among those so reporting, only 21 percent (15) would commit themselves to more than requirements to meet margin calls.

No significant difference was found among size and type of lenders in the effects of hedging on credit limits. However, this finding may be biased by non-response. Small banks were disproportionately numerous among non-responders, perhaps because they have had fewer applicants for loans to financed hedged crops. The extent of such bias is not known.

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APPENDIX: Details of Survey Responses

The data used in the study were generated from a self-administered survey of farm lenders in Illinois. The mail-out questionnaire was designed to measure each lender's credit responses and attitudes toward hedging. Details of the survey sample are summarized in table 1.

The questionnaire was mailed October 19, 1979 to 328 credit agencies in a 26-county area in east central Illinois designated by the U.S. Department of Agriculture's Economic Research Service as predominately grain producing. The banks were selected randomly in each of the three size classes: small banks (total assets less than \$20 million), medium banks (total assets of \$20 to \$50 million), and large banks (total assets more than \$50 million). Selections were made from the 1979 Illinois Bank Directory. The size classes are established to test whether size is associated with credit response to hedging. The proportion of banks sampled in each class is representative of the proportion of all banks in the state found in that class.

Respondents from Production Credit Associations (PCA's) were selected randomly from a list of PCA central and field offices in the 26-county area, provided by Production Credit Association Services of Illinois. PCA's were added to the survey to test whether they differed from banks in credit response to hedging.

In the month allowed for responses, 159 questionnaires were returned, a 48.5 percent response rate (see table 1). Of the 159 returned, 145 (44.2 percent of the number sampled) were suitable for analysis. Thirteen were questionnaires indicating that the lending institution had no farm customers and one was determined not suitable for analysis.

The questionnaire focused on pre-harvest hedged grain pledged as collateral for non-real estate loans to farmers³, and specifically, on corn and soybeans. Data were analyzed with the use of the Statistical Package for the Social Sciences (SPSS), UIUC.

Results

When asked if they had loaned to farmers who pledged hedged corn and/or soybeans as collateral, 77 out of the 145 respondents (53.1 percent) indicated they had (see table 2).

Table 1. Questionnaire Mailed, Returned and Analyzed, by Size and Type
of Credit Agency.

Agency Size and Type	Mailed		Returned		Analyzed	
	Number	Percent of total	Number	Percent of total	Number	Percent of total
Small banks ^{a/}	207	63.1	89	56.0	80	55.2
Medium banks ^{b/}	60	18.3	34	21.4	29	20.0
Large banks ^{c/}	36	11.0	22	13.8	22	15.2
PCAs ^{d/}	25	7.6	14	8.8	14	9.6
Total	328	100.0	159	100.0	145	100.0

^{a/} Assets valued at less than \$20 million

^{b/} Value of assets between \$20 million and \$50 million.

^{c/} Assets valued at more than \$50 million.

^{d/} Production Credit Association: 6 central offices and 19 field offices.

Table 2. Responses of Surveyed Lenders on Loans to Farmers Who Have
Hedged Pledged Corn and/or Soybeans.

Financed hedged crops	Number	Percent of total
Yes	77	53.1
No	68	46.9
Total	145	100.0

These 77 lenders were asked if hedging increased a farmer's loan limits on grain production over the case with no hedging (excluding money advanced to finance margin calls) and if so, by how much. Sixty-eight lenders answered the question. The results are presented in table 3. Forty-eight respondents, 70.6 percent of those responding to the question, indicating that hedging does increase a farmer's loan limits (see table 3A). Twenty respondents, 29.4 percent of those responding to the question, showed no positive credit response to hedging.

Amounts of increase lenders reported as associated with hedging are presented in table 3B. Twenty-three respondents, 47.9 percent of those responding positively to the question, indicated hedging increases a farmer's loan limits between 1 to 10 percent while 20 more, 41.7 percent of the positive respondents, indicated an increase of 11 to 20 percent. The remaining 5, 10.4 percent of the positive respondents, indicated a 21 to 30 percent increase in a farmer's loan limits on grain production because of hedging.

Table 3. Effect of Hedging on (A) Credit and (B) Amount by which Hedging Will Increase a Farmer's Loan Limits (Excluding Money Advanced to Finance Margin Calls).

Effect of hedging on credit (A)	Number	Percent of total
No increase	20	29.4
Increase	48	70.6
Total	68 ^{a/}	100.0

Amount of increase (B)	Number ^{b/}	Cumulative percentage
1% - 10%	23	47.9
11% - 20%	20	89.6
21% - 30%	5	100.0

^{a/} Sixty-eight respondents from a potential 77.

^{b/} Forty-eight from 3(A) indicating credit increase.

Computed values of χ^2 indicate that the likelihood of a positive credit response to hedging does not differ significantly between types and sizes of lenders (see table 4).

The 77 lenders who had loaned to hedgers were asked for the effect of margin calls on the farmer's credit when they had agreed to finance a farmer's hedge. Sixty-nine lenders responded to the question. Their answers are presented in table 5. Fifteen of the 69 respondents, 21.7 percent, indicated that a farmer's credit limit is increased by more than his obligation to meet margin calls. Forty-eight lenders, 69.6 percent of the respondents answering the question, indicated that a farmer's credit limit is increased but by no more than his obligation to meet margin calls; and 8.7 percent of the lenders answering the question cited a decrease in the farmer's credit limit because of his obligation to meet margin calls.

The 77 respondents who had loaned to hedgers were asked about their credit agency's policy when financing initial and maintenance margin funds; 46 responded. Respondents were instructed to circle the most appropriate choice(s). Their responses are arrayed in table 6. Twenty-nine of the 77 respondents who had loaned to hedgers indicated their agency policy is to provide financing for both the initial and maintenance margin funds rather than providing for one or the other or a percentage of both.

Table 4. Probability that Hedging Increases Credit, by Size and Type of

Lender^{a/}

Agency and type	Probability of credit increase
Small banks	71%
Medium banks	59%
Large banks	86%
All banks	71%
PCAs	66%

^{a/}Differences between bank sizes not significant at .05 probability level

(Raw Chi Square Value = 2.70814; Degrees of Freedom = 2) and between all banks and PCAs (Raw Chi Square Value = .07684; Degrees of Freedom = 1).

Table 5. Effect of Hedging on Credit, in Relation to Margin Calls

Credit Effect	Number	Percent of total
Increased by more than margin calls	15	21.7
Increased by no more than margin calls	48	69.6
Decreased by margin calls	6	8.7
Total	69 ^{a/}	100.0

^{a/} Sixty-nine respondents from a potential 77.

Table 6. Lenders Financing Initial and Maintenance Margin Funds, by Type of Policy

Policy	Number	Percent of total
Provide money for initial margin only	6	13.1
Provide money for maintenance margin only	7	15.2
Provide money for both initial and maintenance margins	29	63.0
Provide money for a percentage of both	4	8.7
Total	46 ^{a/}	100.0

^{a/} Forty-six respondents from a potential 77.

Asked for reasons why they loaned to hedgers, 72 of the 77 lenders who had done so responded as indicated in table 7. Respondents were instructed to circle all appropriate response choices. Sixty-seven of the 72 respondents indicated that they think the borrower's risk is reduced by hedging. Sixty of the 67 think lender's risk is also reduced. Three more of the 72 respondents think lender's risk is reduced by customer hedging but did not comment on borrower risk. Nineteen respondents had loaned to hedgers because they thought the customer was knowledgeable about hedging. Twelve lenders indicated they had loaned to hedgers because credit agency personnel were knowledgeable about hedging. Seven respondents cited an able and knowledgeable broker as a reason why they had loaned to hedgers.

The 67 lenders who responded that they think the borrower's risk is reduced by hedging were asked why they thought so. They were instructed to choose all the reasons listed that were appropriate. Sixty-six lenders answered the question. The data in table 8 show that 52 of the 66 respondents thought the borrower's risk is reduced because hedging guarantees a commodity price. Thirty-seven of the 66 respondents indicated borrower's risk is reduced by hedging because the borrower's income stability is increased and 19 of the 66 respondents thought hedging reduces the borrower's risk by guaranteeing a profit.

Table 7. Reasons Respondents Loaned to Hedgers

Reasons	Number of responses	Percentage of total
Borrower's risk reduced	67	39.9
Credit agency's risk reduced	63	37.5
Customer knowledgeable about hedging	19	11.3
Agency personnel knowledgeable about hedging	12	7.1
Broker able and knowledgeable	7	4.2
<i>Total^{a/}</i>	168	100.0

^{a/}Obtained from 72 respondents out of a potential 77.

Table 8. Reasons Respondents Think a Borrower's Risk is Reduced by Hedging.

Reasons	Number of responses	Percent of total
Borrower's income stability increased	37	34.3
Hedging guarantees a profit	19	17.6
Hedging guarantees a commodity price	52	48.1
Total ^{a/}	108	100.0

^{a/} Obtained from 66 respondents out of potential 67.

The 63 lenders who indicated their lending risk was reduced by customer hedging were asked why they thought so. Sixty-one answered the question. Their responses are summarized in table 9. Fifty-three of the 61 respondents indicated that lending risk is reduced because there is a decrease in the relative price risk on collateral. Twenty of the 61 respondents reported that hedging reduces the likelihood of loan default. Nine of the 61 respondents reported that hedging allows a loan to be expanded without increasing the probability of default. Six of the 61 respondents indicated an otherwise weak loan is strengthened by hedging.

Table 9. Reasons Respondents Think Lending Risk is Reduced When Farm Borrowers Hedge.

Reasons	Number of responses	Percent of total
Likelihood of loan default reduced	20	22.7
Loan can be expanded without increasing the probability of default	9	10.2
Decrease in relative price risk on collateral	53	60.3
An otherwise weak loan strengthened	6	6.8
Total ^{a/}	88	100.0

^{a/} Obtained from 61 respondents out of potential 63.

The 77 lenders who had loaned to hedgers were asked if they had made loans to farmers who were hedged that they would not have made had the client not been hedged. Seventy-one of the 77 lenders answered the question. Results are presented in table 10. By examining a .95 confidence interval around the proportion who indicated they have made such loans (19.7 percent), the proportion was found to be significantly greater than zero.

Table 10. Lenders Reporting Loans Made to Hedged Farmers that Would Not Have been Made Had the Applicant Not been Hedged.

<u>Have made such loans</u>	<u>Number</u>	<u>Percent of total</u>
Yes	14	19.7 ^{b/}
No	57	80.4
Total	71 ^{a/}	100.0

^{a/} 71 from a potential 77 respondents.

^{b/} By examining a .95 confidence interval around the proportion who indicated they have made such loans, the proportion (19.7 percent) was found to be significantly greater than zero.

Sixty-eight of the 145 respondents whose responses were analyzed indicated they had not loaned to farmers who pledged hedged corn and/or soybeans as collateral. They were asked why they had not loaned to hedgers. Respondents were instructed to circle the most appropriate choice(s). Sixty-three lenders responded. Table 11 presents the data. Fifty of the 63 respondents indicated they had not loaned to hedgers because they had not been requested to do so. Seven of the 63 respondents cited the borrower's risk not being reduced by hedging. Six respondents cited lending risk not being reduced by hedging as a reason they had not loaned to hedgers. Seven lenders indicated they had not loaned to hedgers because the borrower did not understand hedging. Twelve respondents revealed they had not loaned to hedgers because credit agency personnel did not understand hedging.

Two respondents cited the likelihood of a hedger switching to a speculative position as a reason they had not loaned to hedgers.

Several questions about administering and financing hedges were asked of the 77 lenders who had loaned to hedgers.

When asked what kind of advice they give to customers on hedging, 72 of 77 potential respondents answered. Their responses are arrayed in table 12. None of the banks or PCAs required hedging. Nor did any of the credit agencies that had loaned to farmers forbid hedging. Thirty-nine of the 73 respondents indicated a hedging policy that allows but does not actively promote hedging. Thirty-three of the 73 respondents cited a hedging policy that encourages customers to use selective hedging and 17 of the 73 respondents indicated they provide general advisory service.

Table 11. Reasons Respondents Have Not Loaned to Hedgers.

Reasons	Number of responses	Percent of total
Borrower's risk not reduced	7	8.3
Credit agency's risk not reduced	6	7.2
No request for this type of loan	50	59.5
Borrower does not understand hedging	7	8.3
Agency does not understand hedging	12	14.3
Likelihood of hedger switching to speculative position	2	2.4
Total ^{a/}	84	100.0

^{a/}Obtained from 63 respondents out of a potential 68.

Table 12. Credit Agency Policy Toward Promotion of Customer Hedging.

Policy	Number of responses	Percent of total
Discourage strongly	0	0
Allow, but do not actively promote	39	43.8
Provide general advisory service	17	19.1
Encourage selective hedging	33	37.1
Insist on hedging	0	0
<u>Total</u> ^{a/}	89	100.0

^{a/} Obtained from 73 out of potential 77 respondents.

Lenders were also asked whom they prefer to manage a customer's hedged account. Fifty-eight of a potential 77 respondents replied to the question. Data in table 13 indicate that 36 of the 58 respondents favored the customer to manage his own account. Sixteen of the 58 respondents indicated a preference for third-party agreements between broker, lender, and customer which is legally binding on all parties.

Table 13. Lender Preferences for Management of Customer's Hedged Account.

Preferred manager of customer's hedged account	Number of responses	Percent of total
Prefer lender	2	3.5
Prefer customer	36	62.1
Prefer broker	4	6.9
Prefer third-party agreement	16	27.5
<u>Total</u> ^{a/}	58	100.0

^{a/} Obtained from 58 out of potential 77 respondents.

The 77 lenders who had loaned to hedgers were asked a question about their agency's policy when financing margin calls. They were instructed to circle all appropriate response choices. Seventy-one of the 77 potential respondents answered the question. Table 14 presents their responses. Forty-two of the 71 respondents indicated money provided for hedge financing is part of the customer's operating and/or inventory line of credit while 15 of the 71 respondents indicated they set up a special account category for advancing margin call money. Eighteen of the 71 responding lenders revealed they increase the amount outstanding on a customer's note when advancing margin funds. Twenty-four of the 71 respondents indicated that surplus margin in the customer's brokerage account is applied to repayment of the customer's note.

Table 14. Credit Agency Policy When Financing Margin Calls.

<u>Agency policy</u>	<u>Number of responses</u>	<u>Percent of total</u>
Money provided for hedge financing part of inventory and/or operating line of credit	42	42.4
Set up special account category for advancing margin call money	15	15.2
Increase amount outstanding on borrower's note when advancing margin funds	18	18.2
Margin excess in customer's brokerage account applied to repayment of customer's note	24	24.2
<u>Total^{a/}</u>	<u>99</u>	<u>100.0</u>

^{a/}Obtained from 71 out of potential 77 respondents.

Conclusions

The data generated by the survey suggest that hedging corn and/or soybeans affects the credit of agricultural producers and in a few cases may actually determine whether a farmer receives a loan. Of the 145 survey respondents whose responses were analyzed, 77 indicated they had loaned to

farmers who pledged hedged corn and/or soybeans as collateral. Of the 68 lenders who indicate some sort of credit response to hedging, 48 (70.6 percent) indicated a positive credit response to hedging without commenting on the credit effect of money advanced to finance margin calls.

When asked to comment on how margin calls affect credit, 48 of 69 respondents (69.6 percent), indicated that hedging increases credit by no more than the amount of margin calls. Fifteen of 69 respondents (21.7 percent) indicated that hedging increases credit by more than the amount of margin calls and 6 of the 69 respondents (8.7 percent) reported that because of margin calls, hedging decreases a farmer's credit. The hypothesis that farmers can expect hedging to produce little or no increase in credit tends to be supported by these survey results. Although a farmer may find lenders who will make more loan funds available than if he were not hedged, it is likely that the increase in loan funds will not be greater than the incremental commitment needed to finance the margin maintenance. Consequently, the farmer has little incentive to hedge in order to increase his borrowing capacity.

Most respondents who had loaned to hedgers seem to have done so largely on the basis of perceptions that hedging reduces the risk of both borrower and lender. Sixty-seven out of 72 respondents indicated a belief that hedging reduces a borrower's risk and 60 of these 72 respondents indicated that hedging also reduces lending risk but not, it appears, by enough to offset obligations to meet margin calls. Thus even if the lender perceives borrower risk to be reduced by hedging and responds with a positive shift in the loan (credit) supply curve, this shift appears not to offset the positive shift in the loan demand curve associated with maintaining the margin account. Consequently, credit-net-of-hedge-finance is not increased. Data further suggest that a respondent's reasons for not financing hedgers does not seem to be highly influenced by factors associated with hedging. The primary reason many of the credit agencies have not extended loans on the basis of hedged collateral is that they have not had requests for such loans.

Survey results indicate that among lenders responding to the survey there is no relationship between size and type of credit agency and the likelihood of a positive credit response to hedging. However, small banks are disproportionately numerous among non-respondents in the survey. Hence there is the possibility of non-response bias in the survey data. For example, small banks may have responded disproportionately less in the survey because they experience a lesser incidence of loan applications to finance hedged inventories. They may have less experience because they respond less favorably to applications they do receive. But the extent of such bias is not known.

The 77 respondents who had loaned to hedgers indicated a variety of policies they follow when administering and financing hedges. None of the responding banks or PCAs require or forbid hedging. Lenders' responses indicated that they prefer to leave the initiative of whether or not to hedge with the customer. However, some lenders indicated they have made loans to farmers who were hedged that they would not have made had the farmer not been hedged. Lenders also showed a preference for the customer to manage his own hedged account instead of the lender himself, the broker, or a third-party management agreement between lender, broker and customer. Twenty-nine of the 77 respondents who had loaned to hedgers indicated a willingness to provide money for both the initial and maintenance margins rather than provide money for one or the other or a percentage of both. This response rate is surprisingly low. One would expect the lender willing to finance a hedged inventory to be willing also to finance the margin maintenance requirements. Not to do so invites either (1) split financing on the part of the borrower or (2) risk that the borrower, for lack of finance, may be forced by margin calls to alter his position from a hedger. Some lenders also indicated a willingness to include financing of commission charges in margin fund financing. Forty-two of the 77 respondents who had loaned to hedgers indicated money provided for hedge financing is part of the customer's operating and/or inventory line of credit while slightly less than one-fifth of the respondents who had loaned to hedgers indicated they set up a special account category for advancing margin call money. Twenty-four of the 77

respondents who had loaned to hedgers revealed that surplus margin in the customer's brokerage account is applied to repayment of the customer's note. The wide range of policy preferences indicated by survey responses signals that a potential crop hedger seeking hedge financing would do well to shop about for the credit agency with the hedging policies that best suit his particular needs.

Need for Further Research

Uncertain conclusions, based on conflicting evidence drawn from the study, suggest the need for considering a more intensive survey of (a) those who finance hedges and (b) those who do not. A strong suggestion is for using a projective technique in personal interview. A survey of non-responders would be useful in determining whether non-response bias is a factor in the survey data.

Research is also needed on the use of hedging as an integrated part of the management of a farm; more specifically, to study the effects of these lender responses on hedging and financing strategies that are optimal for farmers that differ in financial attributes. Research is further needed to determine how lending agencies calculate the risk in a loan, how they calculate the amount of risk reduction when a borrower hedges and what price to put on this risk.

Footnotes

1. Hedging is defined as the purchase or sale of a futures contract to offset an equal and opposite transaction in the cash market.
2. Credit is defined as an individual's borrowing capacity. Farmers exchange credit for loans. Lenders extend loans, not credit.
3. The questionnaire dealt with short-term agricultural loans which are defined as those loans which are typically outstanding for one year or less.

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