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AN ANALYSIS OF HEDGING AND FORWARD CONTRACTING
AS AIDS IN OBTAINING CREDIT

BY

RODNEY R. ROESLER

A thesis submitted
in partial fulfillment of the requirements for the
degree Master of Science, Major in
Economics, South Dakota
State University

1968

AN ANALYSIS OF HEDGING AND FORWARD CONTRACTING

AS AIDS IN OBTAINING CREDIT

This thesis is approved as a creditable and independent investigation by a candidate for the degree, Master of Science, and is acceptable as meeting the thesis requirements for this degree, but without implying that the conclusions reached by the candidate are necessarily the conclusions of the major department.

Thesis Adviser

Date 7 /

Head, Economics Department

Date 7 /

2661-9

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CHAPTER I

INFORMATION AND BACKGROUND PERTAINING TO THE STUDY

Introduction

Futures trading in the United States began over 100 years ago. The first commodities traded were grains such as wheat, corn and oats. Since that time, over 50 commodities ranging from live animals and animal products to coffee, sugar and metals have been added to the list of commodities traded in the futures markets. Currently, 29 commodities possessing widely varying physical characteristics are actively traded on United States' exchanges. Appendix Table A-1 lists a number of commodities, some of which are inactive and others which are actively traded on futures markets in the United States.

Statement of the Problem

The basic characteristics of United States agriculture have been changing for a number of years, but during the last 10-15 years the rate of change seems to have accelerated. These basic changes in agriculture--increased use of technology, larger farms, increased production per farm, increased costs of production--have resulted in increased capital needs for farmers and agri-business firms. These increased capital needs have been met primarily by increased borrowing.

Increased borrowing by individuals with fixed assets, however, results in greater risk, as suggested by the principle of increasing risk. This economic principle suggests that as debt increases, the operator's equity as a percentage of total investment declines. For example, if a person with \$10,000 in capital borrows \$10,000, his equity is 50%. If he borrows \$40,000, his equity is 20%. The farmer whose equity is only 20% has a greater risk of losing his original investment than the farmer whose equity is 50%. Even a modest change in price results in a large effect on net income. Therefore, lenders are wont to limit the amount of capital loaned on given collateral because they realize the effect slight changes in price have on a borrower's equity.

Because of the increasing risk associated with increased borrowing and equity reduction, many farmers and businessmen are unable to borrow as much capital as they could efficiently use. For this reason, farmers and agri-business firm managers are interested in any marketing arrangement which reduces their risks of price changes while maintaining or increasing their ability to obtain credit.

There are essentially two major possibilities for achieving this objective. One, through hedging on the futures market; the other, through contractual arrangements between producers and processors called forward contracting. Hedging is defined as the purchase or sale of a futures contract to offset an equal and opposite transaction in the cash market. A futures contract is a legally

binding contract to buy or to sell a stipulated quantity and quality of a particular commodity during a future period, subject to the rules and regulations of the exchange where the contract is made and with price determined by public auction on the floor of the exchange. Forward contracts are non-standardized, private contracts for the future delivery of a commodity. Forward contracts are not subject to the rules and regulations of an exchange and price is determined by private bargaining.

Officials of futures exchanges and processing firms who offer contractual arrangements have long championed futures trading and forward contracting on the basis that these tools increase an individual's capacity to borrow money. Their argument goes as follows: any farmer or businessman who hedges or forwards contracts reduces his risk because he assures himself a given price for his production. He is assured a given price through hedging because his equal but opposite transactions in the cash and futures market should result in losses and gains in the two markets exactly offsetting each other. The forward contract stipulates a price to be paid at the time of delivery; thus, he is assured a given price. Any farmer or businessman who reduces his risk in such a way is usually considered to be a better risk by lenders. Thus, creditors will be prone to lend greater amounts on given collateral.

Studies supporting or refuting this argument have not been made to date. Considering the intensified need for capital by farmer and businessmen, research is required to determine whether or not

hedging and forward contracting actually do increase one's ability to borrow money.

Review of Literature

The literature relating to the use of futures trading and contracting in borrowing money is rather sparse indeed. Only one rather limited study has been completed which relates to the subject. That study, a part of a larger study on potato growers and credit agencies in Aroostook County, Maine, was concerned primarily with determining the number of credit agencies in Aroostook County who had made loans to potato growers on the basis of hedged potatoes.¹ Further, the results were for one county only. It was found in that study that nine of the 21 credit agencies contacted in Aroostook County made loans to growers on the basis of sales of potato futures contracts. Such loans for seven of the nine agencies totaled 8% of the maximum amount of grower loans made by the 21 credit agencies during the season. In this same study it was also found that fertilizer companies were major sources of credit for Maine potato growers. Five fertilizer companies reported credit sales of fertilizer to growers on the basis of forward contractual arrangements. The value of the fertilizer sold in this way exceeded a quarter of a million dollars. No attempt was made to measure the quantity of

¹ United States Department of Agriculture, The Economic Importance of Futures Trading in Potatoes, Marketing Research Report No. 241, AMS.

the effects of hedging on the size of the loan nor the interest rate charged.

There have been several articles in the popular press, i.e., farm magazines, newspapers, extension publications, suggesting that credit agencies consider hedged collateral and forward contracted collateral more favorably for loans than non-hedged and non-contracted collateral. Turner, Olson and Greene indicate that one of the advantages of hedging is that "banks and other lending agencies may advance more credit against hedged inventories than against unhedged inventories."² Bailey, writing in the Journal of Banking, suggests that "to a banker lending on crop collateral, the futures market performs a pair of economic functions. The first is protection against price risk. That is, against a decrease in the value of the collateral . . . A second benefit derived from the futures market is liquidity and integrity of collateral."³ Harry L. Wuerth of the Commerce Trust Company of Kansas City, Missouri, speaking at a symposium for bankers said, "The futures market and futures trading assists us as grain bankers to minimize our risks in an otherwise hazardous industry. In my opinion, it is questionable if the grain business could be financed by private

² Turner, M., Olson, F., and Greene, C., "Futures Trading in Live Beef Cattle," The Western Livestock Round-up, Cooperative Extension Service, South Dakota State College, December 1, 1964, p. 4.

³ Bailey, Fred, "What Every Banker Should Know About Commodity Futures," Banking, October 1967, pp. 60-63.

banks without the facilities offered by the futures markets
Banks look with disfavor on loans to grain customers when the grain is not hedged."⁴ In none of these articles were these statements supported by research findings from a representative sample of the banking industry.

In 1965, Waldner, manager of a cattle company, writing in The Feedlot magazine noted that in talks with numerous bank representatives he had been unable to find a bank which had defined loan policy on hedged cattle, nor was any bank prepared to alter its customary loan policy to accommodate hedged cattle.⁵

Roy V. Edwards, President of Wilson and Company, in explaining the advantages to farmers who forward contract their production with Wilson and Company, pointed out that such a procedure reduces price risk and that "elimination of price risk makes the feeder a better credit risk, and enables his lending agency to safely make more capital available for expansion purposes than could otherwise be done."⁶

It is apparent from the above review of literature that very little research has been conducted on the use of hedging and contracting in borrowing operations. It is also apparent that many

⁴ Wuerth, H., "A Banker Looks at Futures Trading," The Banker and the Futures Market, Chicago: Chicago Board of Trade, 1961, p. 62.

⁵ Waldner, S., "Will Hedging Offer Financing Advantages?," Feedlot, August 1965, p. 12.

⁶ Edwards, Roy V., "Cattle Feeding and the Futures Market," Oklahoma Current Farm Economics, Stillwater: Oklahoma State University, Vol. 40, No. 2, June 1967, p. 46.

people, both professional economists and businessmen feel that futures trading and forward contracting do aid in borrowing money, but no one is quite sure exactly how or how much they aid. This research seeks to provide some answers to these questions.

Theoretical Framework

Futures trading and forward contracting have long been defended and championed on the basis that they aid producers in borrowing money. This argument stems from Hicks' classical theory of risk, forward planning and interest rates.⁷

Hicks, in his discussion of equilibrium and economic systems, suggests that decision makers act differently under risk situations than they do in no-risk situations.⁸ He states, ". . . when risk is present, people will generally act, not upon the price which they expect as most probable, but as if that price had been shifted a little in a direction unfavorable to them."⁹ Assuming that this statement is correct, it can be seen that to protect themselves from risk of loss due to fluctuations in price, creditors have a tendency to lend less than full expected value of assets offered as security on loans. For example, if a farmer

⁷ Hicks, J. R., Value and Capital, 2d Ed., London: Oxford University Press, 1946.

⁸ Hicks, J. R., op. cit., p. 135.

⁹ Ibid., p. 134.

pledges corn with an expected market value of \$1.20 per bushel as security on a loan, the creditor may loan only \$1.00 per bushel. The 20¢ difference in expected value and loan value may be termed the risk premium. This risk premium tends to increase as risk increases. For example, if the above creditor lends only 90¢ per bushel of corn, the risk premium is increased to 30¢.

The problem facing lenders, then, is one of uncertainty.¹⁰ If a mechanism could be devised whereby uncertainty is reduced, it follows that lenders should be willing to lend a greater percentage of the value of given assets pledged for collateral on loans. Hicks suggests such a mechanism. In the same discussion on equilibrium, he states:

"A way does exist, within the orbit of private enterprise, whereby, expectations and plans can be at least partially coordinated. This is the device of forward trading (including not only dealings in forward markets, commonly so called, but also all orders given in advance, and all long-term contracts)."¹¹

He is suggesting futures trading and forward contracting as methods of reducing uncertainty by fixing prices in advance. He points out very distinctly that hedging reduces risk.

"Now there are quite sufficient technical rigidities in the process of production to make it certain that

¹⁰ Knight, F. H., in Risk, Uncertainty, and Profit, Cambridge: Houghton Mifflin and Company, 1921, makes a distinction between risk and uncertainty; however, the terms are used interchangeably in this discussion.

¹¹ Hicks, J. R., op. cit., p. 35.

a number of entrepreneurs will want to hedge their sales for this reason; supplies in the near future are largely governed by decisions taken in the past, so that if these planned supplies can be covered by forward sales, risk is reduced."¹²

If risk is actually reduced by hedging and forward contracting as has been suggested, it seems reasonable to conclude that farmers pledging a given amount of assets that have been hedged or forward contracted would be able to obtain more credit on these assets than if they had not been hedged or contracted. The farmers, thereby, fix a price and assure themselves of a profit margin. Further, this would assure a price for anyone accepting these assets as collateral for a loan, thus reducing any risk he would need to assume for the possibility of a price reduction or a decrease in the value of these assets.

Lenders protect themselves in several ways because they are taking several kinds of risks. One method used by lenders to protect themselves against risk has just been mentioned--namely, lending less money than the actual value of the assets pledged as collateral for the loan. A second method involves the rate of interest that is charged on the loan. Rates of interest depend on several things. Hicks points this out in his chapter on interest rates:

"The money rates of interest paid for different loans at the same date differ from one another for two main reasons: (1) because of differences in the length of time which the loans are to run, and in the way

¹² Ibid., p. 137.

repayment is to be distributed over time; (2) because of differences in the risk of default by the borrower."¹³

Stonier and Hague emphasize the important effect risk has on interest rates charges. They state:

"No firm, however reputable, can guarantee that changes, for example in consumers' tastes, will never affect its profits, and the greater risk incurred by those who invest in commercial bonds means that they will demand a greater return. The more risky the investment, the higher the return demanded."¹⁴

Hicks suggests that it is the risk of default by the borrower that is responsible for the element of risk premium in interest rates. He also suggests that the borrower can increase his ability to borrow by offering the lender better terms. These better terms may take the form of either a higher rate of interest or increased collateral. Essentially, Hicks is saying that the borrower can bargain for increased borrowing power either by pledging greater assets or by offering to pay a higher rate of interest to cover the lender's risk.

Objectives of the Study

The objectives of this study are:

1. To determine the lending policies of banks and Production Credit Associations in South Dakota, Nebraska, Minnesota, and Iowa, with regard to farmers and firms who hedge or contract their production.
2. To determine if hedging and contracting aid the hedger or contractor in borrowing money.

¹³ Ibid., pp. 142-143.

¹⁴ Stonier, A. W., and Hague, D. C., A Textbook of Economic Theory, New York: Wiley and Sons, Inc., 1953, p. 446.

Hypotheses to be Tested

There are several hypotheses to be tested in this study:

1. Hedging and forward contracting aid farmers in borrowing money by increasing the amounts loaned on given grain or livestock assets.
2. Hedging and forward contracting aid agri-business firms in borrowing money by increasing the amounts loaned on given grain or livestock assets.
3. Hedging and forward contracting aid farmers in borrowing money by reducing the interest rates charged on loans secured by hedged or contracted livestock or grain.
4. Hedging and forward contracting aid agri-business firms in borrowing money by reducing the interest rates charged on loans secured by hedged or contracted livestock or grain.

Methodology and Procedure

This study assumes that hedging and forward contracting reduce price risk. Other studies have been completed which support this assumption.¹⁵

The data used in the analysis were collected by a series of two mail questionnaires. The first questionnaire was sent to a random sample of four hundred and forty banks drawn from a population of two thousand and five banks listed in Polk's Bank Directory for the states of South Dakota, Minnesota, Nebraska and Iowa as well as to sixty-five Production Credit Associations within

¹⁵ Graf, T. F., "Hedging--How Effective Is It?", Journal of Farm Economics, Vol. 35, No. 3, August 1953, pp. 398-413. See also Howell, L. D., "Analysis of Hedging and Other Operations in Grain Futures," United States Department of Agriculture Technical Bulletin No. 971, August 1948.

these states. The purpose of this questionnaire was primarily to determine if banks and Production Credit Associations extend credit to farmers and agri-business firms on the basis of hedged or forward contracted collateral. If these credit agencies had not extended credit to borrowers on the basis of hedged or forward contracted collateral, the reasons why such credit had not been extended were to be determined. This questionnaire is analyzed in Chapter II.

The second questionnaire was sent to the one hundred and two banks and thirty Production Credit Associations that had indicated on the first questionnaire that they have extended credit to hedgers and forward contractors. Of this group, 22 Production Credit Associations and 67 banks responded. The purpose of this questionnaire was primarily to determine if hedgers and forward contractors would receive larger loans on given assets and/or lower interest rates on loans secured by hedged or forward contracted collateral. To determine this, respondents were given three case situations in which they were asked to make decisions on the interest rates and the per cent of asset value that they would loan. These three case situations were identical, except that in one case the individual had not hedged or contracted his collateral, in another case he had hedged, and in the third case he had contracted the collateral. Thus, their responses should not be considered the results of actual loans but rather the results of what the respondents said they would do if faced with this situation. It was necessary to use this approach in

order to isolate the effects of hedging and contracting. The analysis of this questionnaire is presented in Chapter III.

This study focuses on farmers and agri-business firm borrowers. For purposes of this research farmers were defined as those involved in producing primary agricultural products, and agri-business firms as those involved primarily in purchasing agricultural commodities for the purpose of processing, storing, or transporting the commodity.

The analysis is both descriptive and statistical. Some of the information received was general and is presented as general descriptive information and background. The statistical analysis involved the use of t tests, chi-square tests and analysis of variance tests.

CHAPTER II

EXTENT TO WHICH CREDIT AGENCIES HAVE
MADE LOANS ON HEDGES AND CONTRACTS

The objectives of this chapter are: (1) To determine the extent to which credit agencies have made loans to farmers and agri-business firms on the basis of their hedging or contracting operations and (2) To determine why those agencies which have not made such loans did not.

Data used in this analysis were obtained from mail questionnaires sent to 505 banks and Production Credit Associations in the four-state area. In all, 395 of these questionnaires were returned for a response rate of 78%. To facilitate the analysis the respondents were divided into three categories: Production Credit Associations (PCAs), large banks and small banks. Large banks were defined as those banks having more than \$10,000,000 in total assets. The discussions of the extension of credit to farmers and to firms have been separated for two main reasons: the first reason is to simplify the presentation and the second is because it is entirely possible that credit agencies may follow one lending policy for farmers and another for firms.

Extension of Credit to Farmers

Although the data in Table 2.1 indicate that in all cases the number of credit agencies which had made loans on hedged collateral was greater than the number that had made loans on forward contracted collateral, the numbers were not significantly greater. About one-third of all the agencies responding have made loans on hedged collateral or forward contracted collateral.

TABLE 2.1

The Number of PCAs, Large Banks and Small Banks That
Have Extended Credit to Farmers on the Basis
of Hedged or Forward Contracted Collateral

	Hedge			Forward Contract		
	PCAs	Small Banks	Large Banks	PCAs	Small Banks	Large Banks
Have Extended Credit	24	34	21	14	29	19
Have Not Extended Credit	<u>28</u>	<u>210</u>	<u>59</u>	<u>32</u>	<u>200</u>	<u>56</u>
Totals	52	244	80	46	229	75

The proportions of the various credit agencies which have made loans on hedged collateral were approximately equal to the proportions that had made loans on contracted collateral. The chi-square value of 1.2689 in Table 2.2 indicates that, statistically, there was no significant difference in these proportions between hedged and forward contracted collateral.

TABLE 2.2

Chi-Square Values Computed from
Data Presented in Table 2.1

Comparisons	Chi-square Values
Total Chi-square	39.949*
Hedge vs. Forward Contract	1.2689
Large Banks vs. PCAs/Hedge	5.606*
Large Banks vs. PCAs/Contract	.376
Large Banks and PCAs vs. Small Banks/Hedged	21.031*
Large Banks and PCAs vs. Small Banks/Contract	11.667*

* The chi-square values are significant at the .05 level.

Greater proportions of the PCAs, however, have had experience with hedgers borrowing money than have the large banks. The chi-square value of 5.606 is significant. This can be partly explained by the fact that PCAs are likely to have a larger proportion of agriculturally related customers than do large banks and the agricultural customers are the ones who would be using the futures market because most commodities traded on futures contracts are agricultural products. There was no difference between the proportion of large banks and PCAs that had made loans on contracted collateral.

A significantly smaller proportion of the small banks than of the large banks or PCAs have had experience in making loans to

farmers on hedged collateral as well as contracted collateral. Both the chi-square values of 21.031 and 11.667 are significant. There are several plausible explanations for these differences. First, it is very possible that the clientele of the agencies are different. Small country banks are more likely to have smaller farmers as their customers while large banks are more likely to have larger, more progressive farmers as their customers. Often the larger farmers are the ones who use the futures market and who contract their production. Second, large banks are more likely to have agricultural credit specialists who understand the use of the futures market and contracting in reducing risk and, therefore, would urge their customers to use such tools. Thirdly, PCAs are more likely to get requests for such loans because they have a larger proportion of farmers as customers than do the large banks.

Extension of Credit to Firms

Many of the same banks that made loans to farmers on the basis of the farmers' hedging or contracting arrangements also made such loans to agri-business firms. There were no usable responses from PCAs, thus they have been omitted from this section.

The proportions of the credit agencies that have extended credit on hedged collateral are significantly different from the proportions that have extended credit on contracted collateral. A much smaller proportion of the agencies have had experience with forward contracting than with hedging (see Tables 2.3 and 2.4).

TABLE 2.3

The Number of Large and Small Banks That Have
Extended Credit to Firms on the Basis of
Hedged or Forward Contracted Collateral

	Hedge		Forward Contract	
	Small Banks	Large Banks	Small Banks	Large Banks
Have Extended Credit	23	27	8	17
Have Not Extended Credit	<u>273</u>	<u>52</u>	<u>218</u>	<u>58</u>
Totals	296	79	226	75

TABLE 2.4

Chi-square Values Computed from
Data Presented in Table 2.3

Comparisons	Chi-Square Values
Total Chi-square	69.373*
Hedge vs. Forward Contract	4.284*
Large Banks vs. Small Banks/Hedge	37.814*
Large Banks vs. Small Banks/Contract	27.275*

* The Chi-square values are significant at the .05 level.

Part of the reason for this difference stems from the fact that most of the credit agencies surveyed are located in an area which produces commodities for which a widespread system of forward contracting has

not been developed. Futures trading, on the other hand, is a highly developed system and is easily available for everyone.

There is also a significant difference between the proportions of small banks and large banks that have extended credit on both hedged and contracted collateral. Fewer small banks have made such loans than large banks (see Tables 2.3 and 2.4). These differences can be attributed to two major factors: first, there are, undoubtedly, differences in the clientele of the different size banks; second, capital requirements of agri-business are usually quite large compared to capital requirements of farmers. Many small banks might not be able to make the necessary amounts of capital available; thus, the firms would tend to patronize large banks that could supply a complete line of credit.

Reasons for Not Extending Credit to Hedgers and Forward Contractors

In all the instances considered above more than 50% of all the credit agencies did not extend credit on the basis of hedging or forward contracting. Since results such as this were anticipated, those credit agencies which did not extend such credit were asked to indicate why. The overwhelming majority of the respondents indicated that they did not extend such credit primarily because there were no requests for such loans. The data in Table 2.5 show that 67% of PCAs, 73% of the small banks and 75% of the large banks who responded to the question had received no requests. A significant proportion of the three groups also indicated that neither the

TABLE 2.5

Reasons Why PCAs, Small Banks and Large Banks
Have Not Extended Credit to Hedgers
or Forward Contractors

	PCAs		Small Banks		Large Banks	
	No.	%	No.	%	No.	%
A) No requests for such loans:	26	66.6	204	72.5	55	75.3
B) Did not think the borrower had reduced his risk:	2	5.1	3	1.1	1	1.4
C) The borrower did not understand the futures market or forward contracting:	6	15.4	33	11.8	10	13.7
D) Our institution has no one who understands the futures market or forward contracting:	<u>5</u>	12.9	<u>41</u>	14.6	<u>7</u>	9.6
Totals	39		281		73	

bankers nor the borrowers understood the futures market and forward contracting arrangements well enough to use them effectively in actually reducing risk.

These responses suggest that there is a serious gap in the knowledge of farmers and officials of credit institutions about the use of and analysis of hedging and forward contracting as a means of reducing risk.

CHAPTER III

THE EFFECT OF HEDGING AND CONTRACTING OPERATIONS
ON LOANS MADE TO FARMERS AND FIRMS

This chapter analyzes the responses from those credit agencies which had made loans on the basis of hedging or contracting operations. The objectives of this chapter are to determine:

- a) the importance of hedging and forward contracting relative to other credit factors.
- b) whether these credit agencies required or advised their clients to hedge or forward contract.
- c) what per cent of their customers do hedge or contract their production.
- d) what effect hedging and contracting have on interest rates charged and size of loans made on given assets.

The data used in this analysis were obtained from mail questionnaires sent to 132 banks and PCAs in four states. Eighty-nine, or 67.4%, of the questionnaires were completed and returned. For purposes of this analysis the respondents have been divided into the five following categories: (1) PCAs that extend credit to farmers, (2) small banks that extend credit to farmers, (3) small banks that extend credit to firms, (4) large banks that extend credit to farmers and (5) large banks that extend credit to firms. Since some of the banks extend credit to both farmers and firms that hedge or forward contract commodities, some of the respondents have been placed in two categories.

Importance of Hedging and Forward Contracting Relative to Other Credit Factors

PCAs and banks consider hedging and forward contracting operations as less important than many other credit factors such as managerial ability, integrity of the borrower and others as shown in Table 3.1. In general, the collateral pledged as security for a loan, the amount of the loan, current indebtedness of the borrower, availability of farm records, size of farm or firm and the percentage of income spent on living expenses are all considered important credit factors by most of the responding banks and PCAs. Only 3.8% of the respondents considered hedging and forward contracting as important as the managerial ability of the borrower or the general integrity of the borrower. Most of the agencies, 65.8%, considered forward contracts signed by the borrower and 66.3% considered hedging operations of the borrower to be of only minor importance or unimportant. This suggests that these methods of reducing price risk are not of primary importance in establishing a line of credit.

Advice Given on Hedging and Forward Contracting Operations

The decision to hedge or forward contract collateral rests on the individual farmer or firm. None of the banks or PCAs required their customers to hedge or forward contract agricultural commodities pledged as collateral for loans. A few of the credit agencies, however, had advised farmer and agri-business firm

Ranking of Credit Factors

	Very Important		Important		Minor Importance		Relatively Unimportant		Total
	No.	%	No.	%	No.	%	No.	%	
1) Integrity of borrower:	86	96.6	3	3.4					89
2) Managerial ability:	74	83.1	14	15.7	1	1.1			89
3) General repayment ability (exclusive of hedges or contracts signed):	68	76.4	21	23.6					89
4) Type of collateral offered (i.e., grain, livestock):	15	17.0	69	78.4	4	4.5			88
5) Amount of loan:	13	16.4	45	57.0	17	21.5	4	5.1	79
6) Current indebtedness:	24	27.9	58	67.4	3	3.5	1	1.2	86
7) Availability of farm records:	8	13.1	42	68.8	10	16.4	1	1.6	61
8) Age of borrower:	1	1.8	22	38.6	30	52.6	4	7.0	57
9) Size of farm or firm:	7	8.0	44	50.6	26	29.9	10	11.5	87
10) Forward contracts signed by the borrower:	3	3.8	24	30.4	28	35.4	24	30.4	79
11) Hedging operations of the borrower:	3	3.8	24	30.0	31	38.8	22	27.5	80
12) Per cent of income spent on living expenses:	3	5.1	38	64.4	11	18.6	7	11.9	59

customers to hedge or forward contract collateral whenever possible. The data in Table 3.2 indicate that 24.1% of the credit agencies advised their customers to hedge and 18% advised them to forward contract.

TABLE 3.2

Proportion of Credit Agencies That Advised or Required Customers to Hedge or Forward Contract

	Require		Advise		Neither Require Nor Advise		Total
	No.	%	No.	%	No.	%	
Hedge	---	---	20	24.1	63	75.9	83
Forward Contract	---	---	16	18.0	73	82.0	89
Totals			36		136		172

Per Cent of Borrowers Who Hedge
or Forward Contract

Only a small proportion of the respondents' customers hedge or forward contract agricultural commodities (see Table 3.3). Most of the responding agencies indicated that 10% or less of their farmer and agri-business firm customers have hedged or forward contracted commodities. At three of the agencies, however, 91% to 100% of their egg producers had contracted their production. Therefore, it seems that most of the farm and agri-business firm customers of the banks and PCAs surveyed do not hedge or forward contract commodities or, if they do attempt to reduce price risk by these methods, many of them

TABLE 3.3

Proportion of Lending Agencies' Borrowers
Who Hedge or Forward Contract Commodities

Commodities	1-10		11-20		21-30		31-40		Per Cent		61-70		71-80		81-90		91-100	
	<u>H</u> ^{a/}	<u>C</u> ^{b/}	H	C	H	C	H	C	H	C	H	C	H	C	H	C	H	C
	Number of Agencies																	
Beef	44	20	2								1							
Hogs	16	14																
Eggs	1	6			2				2				2 1				3	
Corn	33	29	6	1	4													
Soybeans	25	27	9	1	8													
Wheat	7	3			1 2								1					
Potatoes			1														1	

a/H = Hedge

b/C = Forward contract

apparently do not request credit on this basis. It was also indicated that nearly all borrowers who request such loans are customers who have previously established a line of credit with the institution.

Types of Commodities and Percentages of Production Hedged or Contracted

The types of agricultural commodities hedged and contracted varied considerably ranging from beef and hogs to eggs and wheat to castor beans and sunflower seeds. These latter commodities were mentioned as forward contracted commodities by only one or two PCAs. Data presented in Table 3.3 indicate that hedged and forward contracted beef, hogs, corn and soybeans are pledged as collateral more often than are eggs, wheat and potatoes. It also appears that contracted eggs are used as collateral in more instances than are hedged eggs.

The farmers and firms who had obtained loans on hedged or contracted collateral had hedged or contracted only a portion of their production. More than one-half of them hedged less than 50% of their livestock production and none of them hedged more than 80% of their grain production (see Table 3.4).

Types of Loans

Most of the loans made by credit agencies on hedged or contracted collateral were operating loans. However, some of the loans were made for purposes of providing margin money so that the borrower could hedge his production. Margin money refers to the

TABLE 3.4

Proportion of Borrower's Total Production
Which Is Hedged or Forward Contracted

Per Cent	Hedged Livestock	Hedged Grain	Forward Contracted Livestock	Forward Con- tracted Grain
	No. of Agencies	No. of Agencies	No. of Agencies	No. of Agencies
1-10	---	8	11	10
11-20	7	4	6	4
21-30	8	7	5	6
31-40	2	4	---	1
41-50	19	13	2	11
51-60	3	---	---	---
61-70	---	3	---	1
71-80	21	1	3	---
81-90	---	---	2	2
91-100	5	---	2	3

amount of money that the hedger must deposit with a broker at the time he enters into the hedge. According to the data in Table 3.5, 33, or 47%, of the loans to hedgers were for purposes of providing the borrowers with margin money so that they could hedge their production. The data also indicate that 13 of the agencies had made all of their loans to hedgers for margin money and 17 of them had made all of their loans to hedgers for operating capital.

TABLE 3.5

Proportion of Credit Agencies Loans on Hedged
Collateral Made for Margin Requirements
and for Operating Capital

Per Cent	Margin Requirements No. of Agencies	Operating Capital No. of Agencies
1-10	14	5
11-20		2
21-30	2	1
31-40		
41-50	4	6
51-60		
61-70		3
71-80		4
81-90		
91-100	<u>13</u>	<u>17</u>
Totals	33	38

Loans made for purposes of providing margin money present some added problems to lending agencies. One of these problems is concerned with who maintains legal authority to terminate the hedge when repayment of the loan is based on the hedged collateral. If the borrower maintains the right to terminate the hedge at his discretion, the lender could find his collateral unprotected from price change.

Most of the credit agencies who made loans on hedged collateral, however, evidently were not too concerned about this problem. Only two of the respondents indicated that they alone retained the right to terminate the hedge. Several indicated it could only be terminated by joint agreement and the rest indicated that hedgers were allowed to conduct their hedging operations as they wished.

Hedging and Contracting as Aids in Obtaining Loans

We now turn our attention to the second major objective of this study; namely, to the determination of whether hedging and forward contracting aid the borrower in obtaining loans. This analysis is divided into two major parts. The first part is concerned with the first two major hypotheses which deal with the effect hedging and contracting have on the size of loans. The second part of the analysis deals with the second two major hypotheses which are related to the effect of hedging and contracting on interest rates. The analysis deals with both farmers and agribusiness firms and with both livestock and grain assets.

Number of Credit Agencies Making Loans
to Farmers on the Basis of Hedging
or Contracting Operations

At about half of the respondent credit agencies a farmer could receive increased amounts of credit if he secured his loan with hedged or contracted livestock assets rather than with non-hedged or non-contracted livestock assets.¹⁶ Twenty-four out of the 45 agencies that made loans on hedged livestock and 21 out of the 42 agencies that made loans on contracted livestock indicated they would increase the size of loan (see Tables 3.6 and 3.7). The

TABLE 3.6

Number of Credit Agencies That Would Increase Amounts
Loaned to Farmers Who Hedge Livestock

Response	PCAs	Small Banks	Large Banks	Totals
Increase Loans	8	9	7	24
Do Not Increase Loans	<u>7</u>	<u>6</u>	<u>8</u>	<u>21</u>
Totals	15	15	15	45
Computed chi-square = .536		Tabular chi-square = 5.991		
Level of Significance = .05		Degrees of Freedom = 2		

¹⁶ "Increased credit" throughout this study refers to increased amounts loaned on given assets over what would be loaned if those assets were not hedged or contracted.

TABLE 3.7

Number of Credit Agencies That Would Increase Amounts
Loaned to Farmers Who Forward Contract Livestock

Response	PCAs	Small Banks	Large Banks	Totals
Increase Loans	7	8	6	21
Do Not Increase Loans	<u>6</u>	<u>7</u>	<u>8</u>	<u>21</u>
Totals	13	15	14	42

Computed chi-square = .429
Level of Significance = .05

Tabular chi-square = 5.991
Degrees of Freedom = 2

chi-square test indicates there is no significant difference in the responses of the various credit agencies, thus indicating that the same proportion of small banks, large banks and PCAs would extend greater amounts of credit on hedged and forward contracted livestock than on non-hedged and non-contracted livestock. This suggests that any farmer who hedges or contracts his livestock has about an equal chance of obtaining increased credit on those assets at any of the three classes of credit agencies.

Hedged and forward contracted grain can also be used by farmers to gain increased amounts of credit on given assets. About three-fifths of the respondents indicated they would increase the amount loaned on hedged grain over non-hedged grain and about two-thirds said they would do so on contracted grain (see Tables 3.8 and 3.9). The chi-square test on the data in Table 3.8 indicates that

TABLE 3.8

Number of Credit Agencies That Would Increase
Amounts Loaned to Farmers Who Hedge Grain

Response	PCAs	Small Banks	Large Banks	Totals
Increase Loans	10	7	10	27
Do Not Increase Loans	<u>7</u>	<u>7</u>	<u>5</u>	<u>19</u>
Totals	17	14	15	46

Computed chi-square = .819 Tabular chi-square = 5.991
Level of Significance = .05 Degrees of Freedom = 2

TABLE 3.9

Number of Credit Agencies That Would
Increase Amounts Loaned to Farmers
Who Forward Contract Grain

Response	PCAs	Small Banks	Large Banks	Totals
Increase Loans	11	8	9	28
Do Not Increase Loans	<u>3</u>	<u>7</u>	<u>5</u>	<u>15</u>
Totals	14	15	14	43

Computed chi-square = 2.055 Tabular chi-square = 5.991
Level of Significance = .05 Degrees of Freedom = 2

there is no significant difference in the proportions of PCAs, small banks and large banks that would extend increased credit to farmers who offered hedged grain rather than non-hedged grain as collateral. Therefore, if a farmer offers hedged grain as collateral, there is about an equal chance that any of the three types of agencies will offer him increased credit.

The chi-square test on the data in Table 3.9 indicates that there is also no significant difference in the proportions of PCAs, small banks and large banks that would be willing to increase the amounts loaned on given grain assets if the assets were forward contracted. This suggests that a farmer who contracts his grain for forward delivery and uses that grain as collateral for a loan has an equal chance of getting a larger loan from PCAs, small banks and large banks.

Amounts of Increase on Livestock

Although there was no significant difference in the proportions of credit agencies that would increase the size of loans secured by hedged or contracted livestock assets, there were some important differences in the amounts by which the loans would be increased. The data in Table 3.10 indicate that the average increases in loans on hedged livestock ranged from 12.2% to 17.5% of the value of the assets. On contracted livestock the average increases ranged from 11.9% to 18.3%. All of these increases are significantly greater than zero. Therefore, it is concluded that

TABLE 3.10

Average Increase in Amounts That Would Be Loaned on Hedged and Contracted Livestock Assets Over Non-Hedged and Non-Contracted Livestock Assets, All Credit Agencies

Methods of Risk Reduction Compared	PCAs Per Cent	Small Banks Per Cent	Large Banks Per Cent
Hedged vs. Non-Hedged	17.5*	12.2*	12.6*
Contracted vs. Non-Contracted	17.9*	11.9*	18.3*

* The t values are significant at the .05 level.

hedging and forward contracting of livestock assets do aid the farmer in obtaining capital by increasing the amount loaned on given livestock assets.

Analysis of variance was used to determine if there was a significant difference between the amounts that would be loaned by PCAs and small and large banks to farmers who hedge or forward contract collateral. Preliminary analysis of the data indicated that the samples had a common variance and it was assumed that errors were independent and random, thus making analysis of variance applicable. The comparisons made in the data and the computed F values are shown in Table 3.11.

None of the comparisons have F values that are significant. This indicates that there is no significant difference between the increases in amounts loaned to farmers who hedge or forward contract livestock. There is also no significant difference between the

TABLE 3.11

Comparisons and Computed Values of Analysis
of Variance on Data in Table 3.10

Comparisons	Computed F Values
Hedge vs. Forward Contract	.051
PCAs and Large Banks vs. Small Banks/Hedge	.395
PCAs and Large Banks vs. Small Banks/Contract	1.110
PCAs vs. Large Banks/Hedge	0.0
PCAs vs. Large Banks/Contract	.680

Error mean square = 5.160.
Chi-square values are significant at the .05 level.

increases in amounts loaned on hedged or forward contracted livestock pledged as collateral. Thus, it appears that all the credit agencies will increase the amounts loaned to farmers on the basis of hedged or contracted livestock by approximately the same amounts. It can be concluded, then, that PCAs and large and small banks all extend approximately the same increases in amounts loaned to farmers on the basis of either hedged or forward contracted livestock.

Amounts of Increase on Grain

There was some variation in the average amounts each of the different classes of agencies would increase loans on hedged and

contracted grain. The data in Table 3.12 indicate that on hedged grain the average increases were 10.9% by PCAs, 14.3% by small banks and 15.9% by large banks. On forward contracted grain the average increases were 11.4% by PCAs, 14.5% by small banks and 19.5% by large banks. All of these increases are significant. Thus, it is concluded that hedging and forward contracting do increase the amounts loaned on grain assets.

TABLE 3.12

Average Increase in Amounts That Would Be Loaned
to Farmers on Hedged and Contracted Grain
Assets Over Non-Hedged and Non-Contracted
Grain Assets, All Credit Agencies

Methods of Risk Reduction Compared	PCAs Per Cent	Small Banks Per Cent	Large Banks Per Cent
Hedged vs. Non-Hedged	10.9*	14.3*	15.9*
Contracted vs. Non- Contracted	11.4*	14.5*	19.5*

* The t values are significant at the .05 level.

Analysis of variance was also used to determine if there was a difference in the credit policies of PCAs and large and small banks with respect to increased amounts loaned to farmers on the basis of hedged or contracted grain. The comparisons are similar to those made on livestock (see Table 3.13). The computed F values presented in this table again indicate that the PCAs and large and small banks extend similar increases in amounts loaned to farmers who hedge or

TABLE 3.13

Comparisons and Computed Values of Analysis
of Variance on Data in Table 3.12

Comparisons	Computed F Values
Hedge vs. Forward Contract	.026
Large Banks & Small Banks vs. PCAs/Hedge	.104
Large Banks & Small Banks vs. PCAs/Contract	.698
Large Banks vs. Small Banks/Hedge	.026
Large Banks vs. Small Banks/Contract	.281
Error mean square = 4.570 5% Level of Significance	

forward contract grain pledged as collateral. There is not only no significant difference when comparisons are made between credit agencies considering the same method of reducing risk, but also there is no significant difference between the increases due to the risk reducing methods themselves. This suggests that the credit agencies consider hedging and forward contracting as being equally useful in reducing price risk.

It can be concluded from this analysis, therefore, that farmers can expect to get approximately the same amount of increase on loans secured by hedged or contracted grain from PCAs and large and small banks as well.

Loans to Firms

A very small number of banks have extended credit to firms that hedge or contract livestock or grain (see Tables 3.14 and 3.15). In fact, the rate of response was so small that most of the cells in the tables have values less than five; thereby making statistical tests of little value.

TABLE 3.14

Average Increase in Amounts That Would Be Loaned to Firms on Hedged and Contracted Livestock Assets Over Non-Hedged and Non-Contracted Livestock Assets, All Credit Agencies

Methods of Risk Reduction Compared	PCAs		Small Banks		Large Banks	
	No.	%	No.	%	No.	%
Hedged vs. Non-Hedged	0		1	15	3	15.0
Contracted vs. Non-Contracted	0		2	10	2	27.5

TABLE 3.15

Average Increase in Amounts That Would Be Loaned to Firms on Hedged and Contracted Grain Assets Over Non-Hedged and Non-Contracted Grain Assets, All Credit Agencies

Methods of Risk Reduction Compared	PCAs		Small Banks		Large Banks	
	No.	%	No.	%	No.	%
Hedged vs. Non-Hedged	0		2	17.5	6	15
Contracted vs. Non-Contracted	0		3	15.0	2	10

The average increases in amounts loaned to firms on hedged and contracted livestock assets over non-hedged and non-contracted assets by small and large banks ranged from 10% to 27.5%. On hedged and contracted grain the averages ranged from 10.0% to 17.5%. It appears from this data that hedging and forward contracting do actually help agri-business firms by increasing the amounts loaned on livestock and assets. However, no statistical analysis can be accomplished on this data because the number of responses is too small. Therefore, judgment is withheld on the acceptance or rejection of the second hypothesis.

Interest Rates as Related to Hedging and Contracting

The third and fourth major hypotheses of this study dealt with the effect hedging and forward contracting have on interest rates. Economic theory, as explained in Chapter I, suggested that the rate of interest was dependent upon several factors. Included among the factors was risk. It was theorized that if a borrower hedged or contracted the assets he used as collateral for a loan, he reduced his risk of loss from price change, and that this, in turn, reduced the risk of the lender. Therefore, if interest rates were dependent in part on risk and if risk were reduced, then interest rates should also be reduced.

The above theoretical analysis did not bear up too well in reality. Analysis of the data in Tables 3.16 and 3.17 indicates that not a single agency which had made loans on hedged and

TABLE 3.16

Decrease in Interest Rates to Farmers on Loans
Secured by Hedged and Contracted Collateral,
All Credit Agencies

	PCAs		Small Banks		Large Banks	
	Grain	Livestock	Grain	Livestock	Grain	Livestock
Decrease Interest Rates	0	0	0	0	0	0
Do Not Decrease Interest Rates	19	19	16	16	17	17

TABLE 3.17

Decrease in Interest Rates to Firms on
Loans Secured by Hedged and Contracted
Collateral, All Credit Agencies

	PCAs		Small Banks		Large Banks	
	Grain	Livestock	Grain	Livestock	Grain	Livestock
Decrease Interest Rates	0	0	0	0	0	0
Do Not Decrease Interest Rates	0	0	6	6	14	14

contracted collateral reduced the interest rates on such loans. Further, it made no difference whether the loans were made to farmers or to agri-business firms and whether the collateral was hedged or contracted livestock or grain. Therefore, we reject the third and fourth hypotheses and conclude that hedging and contracting have no effect on interest rates.

There are probably two major reasons for these results. First, some of the lenders probably believe that hedging and forward contracting do not reduce their risk. This is probably true of those agencies which indicated they would not increase the amount loaned on hedged or contracted assets. Those agencies which would increase the amounts obviously did not feel that way. Second, those agencies which would increase the amounts loaned probably felt that on the basis of the amount of risk eliminated they could not justify reducing the interest rate also.

CHAPTER IV

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary and Conclusions

The increased capital needs of farmers and firms have been met primarily by increased borrowing. The borrowing capacity of any one individual, however, is limited primarily by the risk that he presents to a lender. This risk takes the form of risk of default on the loan, and risk of the decrease on the price of the assets which are pledged as collateral for the loan. Lenders protect themselves from these risks in one of two ways--either by lending less than the full market value of the assets which are pledged or by charging a higher interest rate, a risk premium so to speak, for undertaking this risk. Hicks has suggested methods of reducing these types of risks. He suggests the use of forward contracts or futures trading whereby a producer can hedge the assets he pledges, guaranteeing himself a price, reducing his risk, and thereby reducing the risk of the lender.

Following Hicks' theory, many writers, economists and businessmen have advocated futures trading and contracting arrangements on the basis that hedging and forward contracting aid producers in borrowing money. No research has been completed which supports these statements. This study is a first step in that direction.

The analysis of the extent to which credit agencies have made loans on hedges and contracts indicates that about one-third of all responding agencies have made such loans. The proportions of the various credit agencies which have made loans on hedged collateral were approximately equal to the proportions that had made loans on contracted collateral. Significantly greater proportions of the PCAs than the large banks have had experience with hedgers borrowing money. Significantly smaller proportions of the small banks than either PCAs or large banks have had such experience with both hedgers and contractors. Much of the differences are undoubtedly due to differences in clientele.

The primary reason why many of the various credit agencies have not extended credit on the basis of hedged or contracted collateral is that they have had no requests for such loans. A significant proportion of the respondents also said they had not made such loans because either they or the borrower did not understand the use of hedging and forward contracting as a means of reducing risk. This suggests the need for educating both borrowers and lenders of the value of reducing price risk through proper hedging and forward contracting procedures.

Hedging and contracting were of minor importance to most of the credit agencies when considering whether or not to make a loan to a farmer or agri-business firm. None of the credit agencies required their farm and firm customers to hedge or contract collateral although a few advised such action. It appears, therefore,

that in most cases hedging and forward contracting can improve a borrower's line of credit, but cannot be considered vital to gaining credit. In most cases only a small percentage of an agency's borrowers attempted to borrow money on hedged or contracted assets and usually only a small proportion of the borrower's production was hedged or contracted.

Although most credit agencies indicated that hedging and contracting did not seem to rank as factors of major importance to a borrower attempting to obtain a loan, it was found that a significant number of the credit agencies would offer significantly larger loans to farmers on hedged or contracted collateral than on non-contracted or non-hedged collateral. Further, it made no difference whether the collateral was livestock or grain. Thus, the first hypothesis is accepted and it is concluded that hedging and forward contracting do aid the farmer in obtaining larger loans on given assets. It was also found that there was no difference among the various credit agencies in the amount they would increase the size of the loan.

The number of respondent agencies that made loans to agribusiness firms on the basis of the firm's hedged and contracted collateral was so small that it was impossible to conduct statistical tests on the data. The data from those that did respond, however, indicated that greater credit would be granted on hedged and contracted assets than on non-hedged and non-contracted assets.

Nevertheless, because of the small number of respondents, no decision can be made on the second hypothesis.

None of the respondent credit agencies indicated that they would reduce the interest rates charged on loans if the loans were secured by hedged or contracted collateral rather than by non-hedged or non-contracted collateral. This was true regardless of whether the collateral was livestock or grain assets and whether the loan was to a farmer or an agri-business firm. Therefore, the third and fourth major hypotheses are rejected and it is concluded that hedging and forward contracting of livestock or grain assets used as collateral for a loan will not reduce the interest rate charged on loans to farmers or to firms.

It is obvious from the above analysis that many bank managers, PCA managers and farmers have not had a lot of experience with hedging and contracting operations and that many of them do not understand the use of these tools in reducing price risk. More research needs to be conducted to determine the actual amount of risk that can be reduced by hedging and forward contracting. If it is determined that this amount is significant, then the futures exchanges and extension personnel from the land grant universities should have an important responsibility in educating farmers and managers of credit agencies on the correct use of these techniques.

Qualifications of Application of Results

Since very little research has been done in this area, this study is necessarily exploratory. For this reason part of the

analysis is descriptive and part of it statistical. Since the study is primarily exploratory it is extremely difficult to use the results in making policy recommendations.

The data were collected from a limited geographical area, thus they cannot be considered entirely representative of other areas of the United States. Further, the study is concerned only with banks and Production Credit Associations. All other lending agencies, such as farm supply firms, are omitted and the results cannot be considered applicable to such other agencies.

Also, the data on the amount of the increase in size of loans covered by hedged or contracted collateral are not the results of actual loans but are rather the amounts that respondents said they would give under a given situation. Further, to the extent that there are inherent deficiencies in the use of mail questionnaires, especially with respect to the validity of respondents' answers, these deficiencies are a part of this study.

Need for Further Research

The current study is limited to Production Credit Agencies and banks. Yet marketing firms and farm supply firms are also important sources of capital to farmers and some of them advance credit to growers in return for the promise of delivery of part of the crop. For example, fertilizer companies often enter agreements with farmers for the future delivery of a quantity of a commodity equal in price to the cost of the fertilizer. The fertilizer

company then hedges the commodity, thus protecting its position. More research needs to be conducted to determine the extent to which such arrangements are used by farmers as a means of obtaining capital.

Further research is also needed on the use of futures trading and contracting not only as an aid in obtaining capital but also as an integrated part of the management of a farm or agri-business firm. Some questions of importance to managers are:

1. Under what conditions should I hedge?
2. When should I hedge rather than contract?
3. What criteria do I use in evaluating a contract?

Research is needed to determine how lending agencies calculate the risk in a loan, how they calculate the amount of risk that is reduced when a borrower hedges or contracts, and what price to put on this risk. Once this information is known, it would then become feasible to make policy recommendations at the firm level.

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APPENDIX A

TABLE A-1

Commodities Actively Traded on Futures Contracts
in the United States Since 1850

Aluminum	*Eggs-frozen	*Rubber
Barley	*Flaxseed	Rye
Beef-dressed	Grain Sorghum	Shorts
*Beef-steer carcasses	Hams-frozen	Shrimp-frozen
Bran	*Hides	*Silver
Butter	*Hogs-live	*Soybeans
*Cattle-live	Lard	*Soybean Meal
*Cocoa	*Lead	*Soybean Oil
*Coffee	*Oats	*Sugar-raw, domestic
*Copper	*Orange Juice	*Sugar-raw, world
*Corn	Platinum	Tin
*Cotton	*Pork Bellies-frozen	*Wheat
Cottonseed Meal	*Potatoes	*Wool-grease
*Cottonseed Oil	Propane Gas	*Wool-tops
*Eggs-shell	Rice	*Zinc

* Commodities currently traded on United States futures markets.

APPENDIX B

First Questionnaire

South Dakota State University Economics Department

Questionnaire No. _____

Reply Kept Confidential

In the following questions a futures contract is defined as any contract traded on a futures exchange. A forward contract is any contract calling for future delivery but not traded on a futures exchange, i.e., a contract between a farmer and a processor. The commodities considered are both grains and livestock.

All information is confidential and your firm will in no way be identified.

1. Do you feel that hedging through the use of the futures market or forward contracting reduces the risk of a farmer's loss due to price changes?

Yes _____ No _____

2. During the past 3 years has your institution extended credit to any farmer on the basis of his attempting to reduce his risk by

a) hedging on the futures market? Yes _____ No _____

b) signing a forward contract? Yes _____ No _____

3. During the past 3 years has your institution extended credit to any agricultural marketing or supply firm, i.e., grain elevator or farmer cooperative, on the basis of its attempting to reduce its risk by

a) hedging on the futures market? Yes _____ No _____

b) signing a forward contract? Yes _____ No _____

If the answer to parts (a) and (b) was YES for both questions 2 and 3, ignore the remaining questions; if the answer to both (a) and (b) was NO for either question 2 or question 3, please answer the following questions.

4. Check the following reasons which best describe why you have not loaned money to farmers or firms who have hedged or have signed forward contracts.

- No requests for such loans.
- Did not think the borrower had reduced his risks.
- The borrower was a poor risk anyway.
- The borrower did not understand the futures market well enough to warrant lending to him on that basis alone.
- Our institution has no one who understands the futures market well enough to determine its usefulness.
- Other (specify) _____
- _____

APPENDIX C

Second Questionnaire

South Dakota State University Economics Department

Questionnaire No. _____

Reply Kept Confidential

A futures contract is defined as any contract traded on a futures exchange. A forward contract is any contract calling for future delivery but not traded on a futures exchange, i.e., a contract between a farmer and a processor. The commodities considered are both grains and livestock.

All information is confidential and your firm will in no way be identified.

1. Number the following factors according to their importance when considering a production loan to a farmer.

1 = Very Important

2 = Important

3 = Minor Importance

4 = Relatively Unimportant

_____ integrity of borrower	_____ availability of farm records
_____ managerial ability	_____ age of borrower
_____ repayment ability	_____ size of farm
_____ collateral offered	_____ forward contracts signed by borrower
_____ amount of loan	_____ hedging operations of the borrower
_____ current indebtedness	_____ per cent of income spent on living expenses
_____ Other (specify) _____	

2. Our firm (check one) (a) _____ requires
 (b) _____ advises
 (c) _____ neither advises nor requires

borrowers to hedge their production on a futures market in order to reduce price risk.

3. Our firm (check one) (a) _____ requires
 (b) _____ advises
 (c) _____ neither advises nor requires

borrowers to sell their production on a forward contract in order to reduce price risk.

4. Does your firm consider a forward contract which stipulates managerial assistance for more credit than a forward contract which does not stipulate such assistance? Yes _____ No _____

5. Approximately what per cent of your borrowers offering each of the following commodities as collateral for loans has hedged the commodities or sold them on a forward contract?

<u>Per Cent Hedged</u>	<u>Per Cent Sold on Forward Contract</u>	<u>Commodity</u>
_____ %	_____ %	Beef
_____ %	_____ %	Hogs
_____ %	_____ %	Eggs
_____ %	_____ %	Corn
_____ %	_____ %	Soybeans
_____ %	_____ %	Wheat
_____ %	_____ %	Potatoes
_____ %	_____ %	Other (specify)

- A. What per cent of these borrowers had borrowed from your firm previous to their hedging or forward contracting arrangements?

_____ % who had borrowed previous to hedging

_____ % who had borrowed previous to forward contracting

- B. On the average, what per cent of these individual borrowers' total production was hedged or sold on a forward contract?

_____ % of their total livestock production that has been hedged

_____ % of their total grain production that has been hedged

_____ % of their total livestock production that has been sold on a forward contract

_____ % of their total grain production that has been sold on a forward contract

6. Of the loans made to hedgers, what per cent were made for

a) _____ % margin requirements for hedging? (Margin money is money which must be advanced by the hedger to his broker at the time the hedge is begun.)

b) _____ % operating capital for producing the commodity?

- (1) Of those loans made where the collateral for the loan was hedged, did your firm or the hedger retain the right to terminate the hedge?

_____ hedger retained the right.

_____ your firm retained the right.

_____ hedge was to be terminated by joint agreement.

7. If livestock which is not hedged is offered as collateral for a short term production loan, what is the usual per cent you would loan on the value of this commodity? _____ %

If grain which is not hedged is offered as collateral for a short term production loan, what is the usual per cent you would loan on the value of this commodity? _____ %

8. Assume two farmers with top managerial ability are equal in all respects, i.e., size of farm, net worth, current debt load, credit rating, etc. Both farmers wish to obtain a short term production loan and both farmers offer as collateral 25 head of choice grade feeder steers weighing 800 pounds with a current value of \$25.00 cwt., or a total value of \$5,000. One farmer has hedged his 25 head of choice steers on the futures market at \$27.00 cwt. The other farmer has not hedged nor has he sold his steers on a forward contract, but he expects to receive \$27.00 cwt. when he sells them. Both farmers expect to market their cattle at 1050 pounds.

- A. What per cent of the value of the hedged assets would you loan? _____ %
- B. What per cent of the value of the assets which were not hedged or forward contracted would you loan? _____ %
- C. What interest rate would you charge the hedger? _____ %
- D. What interest rate would you charge the producer who had not hedged or sold on a forward contract? _____ %

Suppose the collateral offered was \$5,000 of hedged grain and \$5,000 of grain which is not hedged or sold on a forward contract.

- A. What per cent of the value of the hedged assets would you loan? _____ %
- B. What per cent of the value of the assets which were not hedged or sold on a forward contract would you loan? _____ %
- C. What interest rate would you charge the hedger? _____ %
- D. What interest rate would you charge the producer who did not hedge or sell on a forward contract? _____ %

9. Assume again that two farmers with top managerial ability are equal in all respects including credit rating. Both farmers wish to obtain a short-term production loan and both farmers offer as collateral 25 head of choice grade feeder steers weighing 800 pounds with a current value of \$25.00 cwt., or a total current value of \$5,000. One farmer has sold his steers on a forward contract to a meat packing company at \$27.00 cwt. The other farmer has not hedged nor has he sold his steers on a forward contract, but he expects to receive \$27.00 cwt. when he sells them. Both farmers expect to market their cattle at 1050 pounds.

- A. What per cent of the value of the forward contracted assets would you loan? _____%
- B. What per cent of the value of the assets which were not hedged or forward contracted would you loan? _____%
- C. What interest rate would you charge the forward contractor? _____%
- D. What interest rate would you charge the producer who had not hedged or sold on a forward contract? _____%

Suppose the collateral offered was \$5,000 of forward contracted grain and \$5,000 of grain which is not hedged or forward contracted.

- A. What per cent of the value of the forward contracted assets would you loan? _____%
- B. What per cent of the assets which were not hedged or sold on a forward contract would you loan? _____%
- C. What interest rate would you charge the forward contractor? _____%
- D. What interest rate would you charge the producer who did not hedge or sell on a forward contract? _____%
10. Once more assume two farmers with top managerial ability are equal in all respects including credit rating. Both farmers wish to obtain a short term production loan and both farmers offer as collateral 25 head of choice grade feeder steers weighing 800 pounds with a current value of \$25.00 cwt., or a total current value of \$5,000. One farmer has hedged his 25 head of choice steers on the futures market at \$27.00 cwt. The other farmer has sold his steers on a forward contract to a meat packing company at \$27.00 cwt. Both farmers expect to market their cattle at 1050 pounds.
- A. What per cent of the value of the hedged assets would you loan? _____%
- B. What per cent of the value of the forward contracted assets would you loan? _____%
- C. What interest rate would you charge the hedger? _____%
- D. What interest rate would you charge the producer who sold on the forward contract? _____%

Suppose the collateral offered was \$5,000 of hedged grain and \$5,000 of grain sold on a forward contract.

- A. What per cent of the value of the hedged assets would you loan? _____%
- B. What per cent of the value of the assets sold on the forward contract would you loan? _____%
- C. What interest rate would you charge the hedger? _____%
- D. What interest rate would you charge the producer who sold on the forward contract? _____%
11. Do you wish to receive a copy of the results of this study?
_____ Yes _____ No
12. Please use the reverse side for any additional comments you may wish to make.