A SURVEY OF RISK MANAGEMENT IN KANSAS BANKS

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TABLE OF CONTENTS

T A B L E O F C O N T E N T S -- Continued

A C K N O W L E D G E M E N T S

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LIST OF TABLES AND FIGURES

Table

Table

Table

Figures

CHAPTER ONE

INTRODUCTION

STATEMENT OF PROBLEM

Commercial bank management has become an increasingly challenging task in the 1980's. The banking environment has changed to make the process more complex and more risky. The contributing factors include macroeconomic factors, deregulation, and for Kansas bankers, a strained farm economy. As the banking environment has become more complex, some managers see the situation as a threat to their banks' survival; others, however, may view the changing environment as an occasion when good management will truly be rewarded. In any event, the more complex environment has changed the riskiness of banking, and management is being challenged to adapt to this situation or get out of the business.

An important set of factors affecting the banking environment come under the heading of "macroeconomic variables." The behavior of interest rates, in particular, changed from stability to relative instability, especially during the early 1980's. The resulting effects on banks' cost of money spurred the development and adoption of interest rate sensitivity measures and management techniques. The prosperity, and thus banking activity, of both borrowers and depositors are also affected by other macro factors such as inflation, exchange rates, unemployment, and the general

health of the economy.

Naturally, bank clientele's prosperity (or lack thereof) is reflected in the successfulness of the bank. Bank management has thus been acting to develop methods to deal with changes in their business caused by the influence of macroeconomic factors on creditors, depositors, and other sectors of the bank.

Another set of factors contributing to the changing banking environment is the deregulatory changes that have taken place over the last several years. Regulation Q, which governed interest rate ceilings on banking deposits, has been phased out. This has resulted in greater competition for investors' funds at a greater cost to banks. The availability of new types of investment accounts and investors' sensitivity to these improved investment opportunities have worked together to raise banks' cost of funds and make it more responsive to fluctuations in the national money market rates. This is a relatively new development for Kansas banks, particularly for many rural banks in the state. Greater competition for funds has developed between banks themselves and also between banks and other types of depository and investment institutions.

Deregulation has also changed the competitive environment in Kansas through the change in banking structure laws. Bank holding companies may now own controlling interest in more than one Kansas bank. Just how deregulation will affect the nature of competition is a matter of dehate among Kansas bankers; it is probable, though, that some bank holding companies will grow larger through the acquisition of other hanks. Thus, through changing costs, reduced insulation from national markets, and

increasing competition, deregulation bas changed the banking environment and altered the risks faced by bank management.

A tbird major factor in the changing banking environment for Kansas bankers is the stressed farm economy. Because so many Kansas banks are agriculturally oriented, the agricultural recession is of some concern. The financial stress faced by farmers has translated into financial stress for agricultural lenders all across the United States. The depressed farming conditions of the 1980's represent a drastic change from the conditions of the 1970's, wben optimism about bigher commodity prices, expanding exports, and rising land prices fueled expansions in many farming operations. As eacb of these conditions turned around in tbe 1980's -- commodity prices are generally lower, export demand has shrunk, and land prices bave fallen -- farmers have been strained to adjust. Banks have borne some of tbe brunt of the adjustment, too, as many farms bave folded, leaving tbe banks to salvage what tbey can.

Tbe conclusions to be drawn from these considerations are that banking haa become more risky and bank management has become more complicated. Quality of many rural banks' loan portfolios is down, banks' cost of funds is generally bigher and more volatile, and greater competition exists. The greater incidence of bank failure, botb in Kansas and across the country, is even more evidence for the claim tbat bank management is more risky today.

There are several types of risk faced by bankers, and there seems to be higher levels of risk present today in a number of tbose categories. Tbe problema of identifying, measuring, and

responding to these risks are problems bankers have always faced, but tbe answers today are perhaps more challenging than ever.

STATEMENT OF OBJECTIVES

Tbe basic objective is to study Kansas bankers' management of risks inberent in their industry. Tbis objective can be subdivided into the problems of identifying, measuring, and responding to risks.

More specifically, one ohjective is to determine which risks bankers perceive as most influential to the success of their operations. Identifying the source of a problem or risk is an important first step in dealing with that prohlem, so it is valuable to see which risks hankers perceive as being tbeir biggest problems.

A related question deals with tbe reasons why bankers consider certain risks more important tban others. Not only should tbe relative importance of tbe different risks be weighed, hut the reasons for these rankings should also he considered.

A second specific objective is to examine how hankers measure or monitor the risks they face. This is closely related to, and in some ways a part of, the identification process since it involves identifying the level of each type of risk. Once problems have heen identified, these risks must he monitored to determine how they are affecting hank operations and how well risk treatment tecbniques are working.

The third specific objective is to examine how hankers respond to risks once they have identified them and determined tbat action is necessary. Each step in the risk management

process is crucial, but this step may be the most crucial. Because many Kansas bankers are agricultural banks, and since the agricultural economy is so troubled at this time, a special aim of this study is to examine risk responses dealing with the agricultural lending function.

A final objective is to examine differences in the performance and practices of different groups of banks. Comparisons are made among banks according to differences in size, location, clientele, management experience, and overall CAMEL rating.

All the stages of risk management are thus examined to meet the general objective of determining how well risk management works. Each area of risk management -- identification, measurement, and treatment -- will also he examined to identify any changes occurring over the last five years, changes which may have been warranted because of the changing banking environment.

JUSTIFICATION OF STUDY

The changing hanking environment has made hank management more challenging in the 1980's. Therefore, a study of past and present risk management techniques seems warranted in order to provide hankers with valuable information for future management.

More specifically, this study should accomplish several valuable tasks. First, it should lead to improved recognition of the different types of risk and point out which ones are most important. Second, it should identify preferences for measures of risk and determine which risks are most difficult to measure. Third, the study will detail bankers' responses to risk -- which

responses are used, and which are most popular. Fourth, this study will examine how risk identification, measurement, and treatment have changed over time to see how risk management has changed in this period. Finally, comparisons of more sucessful and less successful banks are made in order to detect differences in risk management which may contribute to a bank's success. This information should be useful to bankers seeking ways to improve their operations.

OUTLINE OF STUDY

This report provides both a theoretical discussion of risk in banking and a review of risk management techniques currently used. The methodology of the study is discussed, and the results of the study are reviewed. Finally, conclusions on the nature of risk management in Kansas banking are stated.

The theoretical discussion first presents an explanation of the general role of a financial intermediary in our economy. Against this background, the types and sources of banking risk are discussed, with details on each specific risk and the interrelationships between the different types of risk. These theoretical developments are also placed in the context of the current economic and regulatory conditions to point out the risks facing Kansas bankers today.

The second part of the theoretical discussion deals with both the measurement and treatment of banking risks. Measurement of each type of risk is discussed. Similarly, the responses to each type of risk are reviewed, with explanations of how each response deals with risky situations in the bank. The

interactions of various risk management techniques are also outlined. Finally, risk management's interaction with other bank management goals is considered.

The empirical analysis includes a discussion of both the methodology used and the results of the survey. The methodology review considers the survey design, the population sampled, and the various types of snalyses conducted. The survey results for all banks are presented, followed by the results of comparisons made among particular groups of banks and bankers.

The report concludes with s summsry of the results of the study. Conclusions on Kansas bankers' risk management behavior are stated. These conclusions have implications for a number of different groups. One groups is Kansas bankers, as they strive to manage risk in their operations. The other groups are farmers, other businesspeople, and depositors in general, since their relationships with their banks could change as the banks adjust their risk mansgement practices.

CHAPTER TWO

FINANCIAL INTERMEDIATION, BANKING RISK, AND THE CURRENT BANKING ENVIRONMENT

INTRODUCTION

Financial intermediation is a crucial part of a well-developed capitalistic economy like that of tbe United States. The transfer of capital accomplished by financial intermediaries makes both savings and investment more attractive and can be done for a profit for bank owners, too. Just like other business enterprises, financial intermediaries face certain risks. The risks come from the nature of tbe business where savers, borrowers, bank owners, and regulators all require that their needs be met simultaneously in ever-changing economic and regulatory environments. Intermediary management is complex as different goals and risks must be weighed against each other. However, a well-functioning financial intermediation process is necessary for our economy to function efficiently.

Tbis chapter first reviews tbe role of a financial intermediary in our economy. Consideration of the economic role of financial intermediaries in general, and commercial banks in particular, fosters understanding for a discussion of the risks of the banking business. Botb the types and sources of banking risk are reviewed. Finally, risk is considered in the light of current economic and regulatory conditions to provide a better

understanding of risk in the current banking environment.

THE FINANCIAL INTERMEDIATION PROCESS

In simplest terms, the financial intermediation process has as its goal the satisfaction of the diverse desires of both the ultimate borrower and the ultimate lender in our economy. The efficient transfer of capital from savers to borrowers provides tbe means for economic growth and meets the needs of both borrowers and savers. Intermediaries compete to provide their services for tbe least cost and greatest profit for themselves. Regulators oversee tbe process to prevent abuses and incompetence from undermining the financial system. Thus, participants include savers, borrowers, intermediaries, and regulators, each with tbeir own goals.

Financial intermediation has been defined as the process wbere "tbe financial sector collects savings from savers, or surplus spending units, and directs the funds to borrowers, or deficit spending units."[1] The more efficiently this transfer is accomplished, the larger the flow of capital, the greater the accommodation of borrower and saver preferences, and tbe greater the overall gain to the entire economy. Financial intermediaries bridge the gap between borrowers and savers when the two parties' preferences on financial claims differ with regard to size, maturity, legal cbaracter, marketability, divisibility, liquidity, redeemability, and risk.[2] Intermediaries thus create two markets where only one would exist otherwise; that is, a single market where ultimate savers and borrowers interact is replaced

by one market whose players are savers and intermediaries and another market whose participants are borrowers and intermediaries. All parties -- savers, borrowers, and intermediaries -- benefit from this arrangement, and the economy as a whole benefits, as well.

The intermediaries perform several types of intermediation services which are the bases for their existence. A list of these services include:

1) denomination (size) intermediation;

2) maturity intermediation;

3) default and price risk intermediation;

4) interest rate intermediation; and

5) information intermediation.[3]

Denomination and maturity intermediation services are easy to understand -- savers and borrowers seldom have similar preferences in these areas. Default risk and price risk intermediation allocate capital from very risk-averse savers to borrowers taking calculated risks, all at prices that are mutually beneficial and economically efficient. Interest rate intermediation protects savers and borrowers from some undesirable effects of interest rate fluctuation. Information intermediation spares savers the effort of investigating potential borrowers' creditworthiness.

The services performed by intermediaries are also the sources of their potential profits. Each form of intermediation involves some type of risk or effort that requires a compensating return if it is to be performed. Intermediaries are able to assume these risks and still make profits by spreading their

costs and risks over large pools of resources that behave in a fairly predictable way. This specialization also improves the effectiveness of capital allocation in a risk-return framework. The aims of the financial intermediation process include efficient allocation of resources for the economy, reduced costs to borrowers, greater returns and safety for savers, and profits for the entrepreneurial intermediary.

A commercial bank is one of the several types of financial intermediaries common in the United States. The distinctions between commercial banks and other intermediaries are becoming fewer and fewer over time as deregulation changes the financial sector. A bank is legally defined in Section 2 of the Bank Holding Company Act as

> "any institution organized under the laws of the United States, [and] and State of the United States . . . which (1) accepts deposits that the depositor has a legal right to withdraw on demand, and (2) engages in the business of making commercial loans."[4]

Commercial banks are characteristically funded through both demand and time deposits, and they typically invest these funds in loans and certain types of securities. Commercial banks operate with the intention of making profits for the owners. Management has the task of maximizing owner wealth within the framework of constraints set up by regulators, competitors, and others.

Other types of intermediaries include savings and loans, credit unions, finance companies, and insurance companies. Another noteworthy intermediary for agriculture is the Farm Credit System. Some of these intermediaries collect funds in a very different fashion than do commercial banks, but all are

performing some of the basic intermediation services.

An important force in the banking process is the regulators. Since resources of so many people are held by banks, regulators work to ensure that banks are using sound operating practices. The regulators have the important job of preventing abuses or incompetence from undermining the system, thus maintaining the public's confidence. There are often differences of opinion between bankers and regulators as to how much supervision and regulation are necessary. The record seems to indicate that current regulatory practices protect the public interest while allowing banks to operate as profit-oriented businesses. Channels exist, however, for bankers and regulators to continue to change the system as necessary to accomplish both of these goals.

TYPES AND SOURCES OF BANKING RISKS

It is necessary for banks to assume certain risks as they perform their intermediary services. The risks considered in this study are:

a) credit risk: the risk of potential delinquency or default on loans and securities;

b) investment risk: the risk of capital losses on the sale of securities before maturity;

c) liquidity risk: the risk of inadequate funding sources;

d) cost of funds risk: the risk of unfavorable changes in the bank's cost of funds;

e) solvency risk: the risk of insolvency, especially due to the bank's high financial leverage; and

f) regulatory risk: the risk resulting from changes in the regulatory environment.

An in-depth examination of each type of risk is necessary to fully understand how it arises and how it should be measured and managed.

Credit risk. Credit risk is the risk that repayment of interest and principal will be delinquent or in default. This is perhaps the most obvious type of risk in banking since banks' lending activities are their primary sources of income and often their primary source of problems. Nonpayment creates obvious problems for the bank.

Nonpayment is a direct business loss; both the principal loaned and the interest accrued are lost. Loan losses are written off against the bank's capital, thus reducing the owners' equity in the bank and increasing the chance of bank insolvency. Some recovery may be made through foreclosure or other repossession measures, but these are costly in terms of officer time, legal costs, and public image. Even delinquency is costly, since it impedes normal operation of the bank by requiring officer time for collection procedures, by disrupting the normal flow of funds through the bank, and by moving loans toward default standing and capital write-down.

Bankers face the same risk-return trade-off confronting all other types of investors as they make their investment decisions. Regulators also have certain standards regarding risk that they impose order to maintain some safety in the system. Bankers are penalized for assuming too much credit risk through capital

write-down that results from loan losses.

Credit risk may come from three different areas in the bank: the loan portfolio, the securities portfolio, and interbank lending activities. Each area differs in how it fits into the entire bank's operation, and the degree of credit risk exposure also differs in each area.

The loan portfolio is the greatest source of credit risk in the bank. A bank's lending activity is its primary source of income, and some degree of risk is assumed in order to achieve an acceptable level of income. The bank's lending activity incorporates the performance of the intermediary services mentioned before (i.e., denomination intermediation, maturity intermediation, default risk intermediation, etc.), all of which involve some degree of risk. Also, different types of loans have varying degrees of riskiness. Installment and commercial loans, for example, typically have higher rates of default than real estate loans.[5] Making different types of loans is a form of diversification in that the portfolio includes a large pool of assets which hopefully will not deteriorate simultaneously.

The securities portfolio is the second source of credit risk in the bank. Compared to their loans, most securities owned by banks are not nearly as prone to default. The purpose of the securities portfolio is to provide liquidity and assets for pledging, rather than provide a major source of income as do loans, so it is logical that this portfolio would be exposed to less credit risk. Regulations also limit investment to certain types of securities to ensure that unnecessary risks are not taken. Still, the risk of nonpayment is a relevant consideration

for most of a bank's debt securities. Losses from nonpayment of these investments is relatively uncommon.

The third area providing credit risk is its interbank lending activities. More specifically, these sources of risk are:

1) "due from" account balances maintained in excess of the FDIC-insured $100,000 level;
2) the Fed Funds Sold position;
3) money market investments with other banks, such as the partially uninsured negotiable CDs and unsecured bankers' acceptances;
4) operational services provided by other banks, such as collections for correspondent loans and wire transfer transactions;
5) contingent credit risks, such as acceptance of standby letters of credit; and
6) "downstream" correspondent participation loans.[6]

There are very different levels of credit risk exposure just within this group of activities. For example, the Fed Funds Sold position would be much less risky than the correspondent participation loan situation. The contingent risks are very difficult to quantify, too, which makes a comparison to the other categories difficult. As a whole, however, this entire group of activities is less risky than the bank's customer lending activities. Explicit risk measurement and management techniques for these activities are still being developed.[7]

Investment risk. Investment risk, the risk of realizing capital losses on the sale of securities, is one of the risks banks experience in the face of changing interest rates. The

value of a fixed coupon bond falls when interest rates rise; therefore, the value of a bank's securities portfolio falls as interest rates rise. Tbis unexpected rise in interest rates thus reduces tbe bank's net worth.

Losses on securities are not realized, though, until they are actually sold. Thus, circumstances requiring the liquidation of these assets are important to investment risk exposure. The decline in bond value before sale can also be important to a bank whose stock is actively traded, since the bank's net worth (and thus its stock price) will decline as the value of its security portfolio declines. Thus, while tbe bank's exposure to investment risk depends in part on tbe volatility of interest rates, it also depends on tbe nature of tbe bank's ownership.

Because circumstances requiring the liquidation of devalued securities is important, investment risk has a close relationship witb liquidity risk. If devalued securities need not be sold, tbey may mature and tbe proceeds reinvested at bigher rates with no loss realized. Sale of securities would be caused by cash demand (e.g., withdrawal demand and loan demand), so management of tbe bank's liquidity position is important to its investment risk exposure.

Liquidity risk. Liquidity risk is the risk that a bank will experience a loss of funding sources and be unable to meet demand for funds. Again, tbere exists a linkage with investment risk since the sale of securities for liquidity purposes can create capital losses. A bank's liquidity needs come primarily from witbdrawal demand, which would have the greatest priority, and

from loan demand, which is important for the realization of good investment opportunities. Factors which affect deposits, withdrawals, and lending thus affect tbe bank's exposure to liquidity risk.

Cash and unpledged marketable securities represent only a fraction of a bank's total assets, but this fraction is used to provide a liquidity reserve. Bank management desires to minimize the amount held in these low or nonearning assets while still maintaining an adequate reserve. Thus, the less volatile the casb flow patterns, the smaller the reserve may be to still remain adequate. Tbe predictability of the cash flows is also important, since predictable cash flow patterns also permit smaller reserve levels. Banks holding large volatile deposits like negotiable certificates of deposit (CD's) may have greater liquidity risk exposure.

Marketability of securities and tbe bank's pledging requirements are further considerations in determining liquidity risk exposure. Because banks hold some securities which may not be readily marketable, such as some state or local bonds, attention to composition of tbe securities portfolio is necessary. Securities pledged against secured deposits are also ineligible for sale to meet liquidity needs.

Cost of funds risk. Cost of funds risk is the risk of facing unanticipated changes in the cost of funds as interest rates change. Expressed another way, it is "the risk of loss of net interest income [resulting] from movements in borrowing and lending rates not being perfectly synchronized."[8] Perhaps the most obvious example of this would be an occassion when lending

rates could not respond quickly enough to maintain the bank's interest margin when savings rates were rising. A less obvious situation of cost to the bank would be one where lending rates were declining while relatively longer-termed liabilities kept interest costs high, again reducing the interest margin. Thus, cost of funds risk exposure is based on the volatility of interest rates and the maturity structure of both assets and liabilities.

Maturities are important because they determine the speed with which banks can respond to changes in interest rates. The relative maturities of rate-sensitive assets (RSA's) and rate-sensitive liabilities (RSL's) determine the behavior of the interest margin when interest rates change. When interest rates rise, the interest margin widens when RSA maturities are shorter than RSL maturities, since RSA rates climb more quickly. The interest margin narrows when RSA maturities are longer than those of RSL's during periods of rising rates. When interest rates fall, these conditions are all reversed. In considering the question of maturities and cost of funds risk, two related concerns are the speed at which rates can be adjusted on variable rate loans and the overall importance of variable rate loans in the loan portfolio. Both of these factors can affect the interest rate sensitivity of a bank's assets.

Solvency risk. Solvency risk is the risk that the bank may become insolvent. That is, solvency risk is the risk that the bank's capital becomes inadequate as its asset values decline relative to the value of claims against the bank.

Insolvency is what ultimately closes a bank, but insolvency itself is the result of many problems from throughout tbe bank. In particular, loan losses produce insolvency because they reduce tbe bank's net worth through write-down of capital. Thus, credit risk is a key component in determining solvency risk exposure. Other problem situations in tbe bank which result in lower income tbrougb lower revenues, higber costs, or botb, also contribute to solvency risk exposure in that tbey prevent internal earnings from supplying potentially crucial capital. Tberefore, risk-taking in all bank operations is ultimately reflected in solvency risk exposure.

Regulatory risk. Regulatory risk is the risk of unfavorable effects resulting from changes in tbe regulatory environment. Examples of regulatory cbanges influencing banking operations are the effects on cost of funds produced by the phase-out of interest rate ceilings, and tbe effects on tbe nature of competition caused by changes in banking structure regulations. Regulatory risk is perhaps the most difficult risk to quantify, as there are no financial ratios or indices with which to measure tbis risk. It is apparent, tbough, that some regulatory cbanges have hrought about changes in hanking operations and performance.[9]

The changing regulatory environment of the 1980's has produced the most changes in hanking since the reforms instituted in the 1930's. Operations within banks have changed as interest rate ceilings have disappeared, new types of accounts bave become available, and new types of services have heen instituted. Competition between banks and other types of financial institutions

has become more intense as geographical restrictions have been eased and distinctions between types of financial institutions have become less marked. Again, effects of regulatory changes are very difficult to quantify and vary from bank to bank, but they do influence bank operations and performance.

Interrelationships between risks. It is apparent that there are many relationships between the different risks. It is also apparent that overall bank performance is the result of many interactions taking place between these different factors in the bank. Therefore, no evaluation of one type of risk exposure and treatment should be made without at least some consideration of how this treatment would influence other types of risk exposure.

A number of interrelationships have been mentioned, and several others exist. One very important relationship is the one between credit risk and solvency risk; the assumption of more credit risk increases the likelihood of loan losses which expose the bank to a greater risk of insolvency. The relationship between investment risk and liquidity risk considers that the exposure to capital losses on securities may be heightened by a lack of liquid reserves in the bank. Another relationship exists between cost of funds risk and credit risk; with variable rate loans the bank can pass on its cost of funds risk to the borrower but this in turn increases bank credit risk exposure as the borrower now must deal with the uncertainties associated with cost of funds risk. Obviously, these interrelationships must be considered in the management of banking risk, since the treatment of one problem may create another one.

RISK AND THE BANKING ENVIRONMENT OF THE 1980'S

It is necessary to consider banking risks in the context of the current banking environment. Only by considering these uncertainties in the framework of current conditions can practical application be made.

There are both regulatory and economic factors which have changed the nature of banking in the 1980's. These factors have made banking more complex and more competitive. The decade of the 1980's has been a time of great change and innovation in banking and the financial sector as a whole. New sources of risk exposure have been created as the banking environment has changed.

One important factor in the changing banking environment is the changing regulatory setting in which banks and other financial institutions operate. These changes in the regulatory environment have introduced regulatory risk in that these new rules have created conditions where further unfavorable effects are possible.

The greatest regulatory changes of the 1980's came in 1980, when the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) became law. This law incorporated changes discussed for years by experts. Changes were deemed necessary because of existing rules "made obsolete by changes in the economy, the functioning of credit markets, technology, consumer demands for financial services, and the competitive environment."[10] The aims of the DIDMCA were to:

1) improve regulatory controls over the money supply and to

equalize the cost of doing this for all depository institutions;

2) remove the impediments to competition for funds among depository institutions and allow small savers to achieve a market rate of return; and

3) expand the availability of financial services to the public and reduce the competitive inequalities between financial institutions offering them.[11]

Measures taken to implement these goals included the imposition of uniform reserve requirements at all depository institutions, the phase-out of interest rate ceilings, authorization of negotiable order of withdrawal (NOW) accounts and other interest-bearing transaction accounts at both banks and savings and loans, and the broadening of savings and loans' powers and activities. These steps brought relatively major changes to the U.S. financial sector.

Implementation of these changes had several direct effects on banking operations and performance. One direct effect of the phase-out of interest rate ceilings, coupled with the proliferation of new interest-bearing deposits, was to raise banks' cost of funds as previously nonearning demand deposits and passbook savings moved into higher-earning accounts.[12] More competition was spawned among banks and other institutions for these deposits as interest rate ceilings were lifted. The greater competition among banks, savings and loans, and even other entities such as nonbank banks and investment banking firms has put greater stress on some banks in their pursuit of profit with safe operation.

Other regulatory changes have influenced bank performance in

this period, too. In particular, hanking structure laws have heen moving the industry toward an environment of greater competition. Limited interstate and regional banking conditions exist and will prohahly he hroader in the future. In Kansas, multihank holding companies were authorized in 1985 and represented a major change in this state's hanking structure policy. The long term effects of these regulatory changes are suhject to debate, hut the effect of hroadening the competitive financial market seems to he one of the results.

Other important factors influencing hank operations and performance could he classified as economic factors. Examples of these factors are inflation, fluctuating interest rates, and the state of hoth the economy in general and certain sectors of the economy in particular. The changing economic conditions of the 1980's seem to have altered the extent of banks' risk exposure. Some hank operations have hecome more complex and performance has sometimes suffered while adjustments were heing made to deal with new conditions.

One example of changing conditions' influence on hanks in this period is seen in the conditions of interest rate volatility in the early 1980's. This time period saw interest rates climh to record levels, fall hack to near-normal rates, and then climh to new record heights. This process increased cost of funds risk, as cost of funds rose and fell with market rates. Investment risk would have heen a greater hazard to hanks with actively traded stock and to all hanks forced to sell devalued securities. Credit risk crept into the picture when borrowers could obtain

loans only at much higher interest rates. These risks spurred the sdoption of new risk management techniques like gap management, hedging cost of funds risk with financial futures contracts, and the increased use of variable rate loans. Interest rates have become more stable in the mid-1980's, but the effects of interest rate volatility remain visible through the continued use of these new risk management techniques.

The health of a specific sector of the economy, namely agriculture, has had visible effects on banking performance in the United States in the 1980's.[13] Since 1981, farm income has declined, leaving many farmers in poor financial condition. This situation has produced credit risk and solvency risk exposure as loan losses and delinquencies have mounted. Agricultural banks now represent a disproportionately large share of regulators' "problem" banks.[14] A recent nationwide survey indicates that many bankers see the farm recession as being a long-term problem, so this trend of deterioration may well continue.[15]

In summary, the banking environment has experienced major changes, as regulatory and economic factors have worked to create a more complex, more competitive banking setting. This new and changing environment has produced greater risk exposure for some banks. As a result, new risk management techniques are being adopted to deal with the new conditions.

SUMMARY

Commercial banks perform the very important job of providing the financial intermediation services necessary for our economy to function. Ultimate borrowers' and savers' needs are met while

banks typically earn a profit for the services they provide. One of these services is the assumption of risk in the intermediation process. Banking risk can be broken down into several categories according to tbe nature of risk presented to tbe bank (e.g., credit risk, liquidity risk, and solvency risk). Many complex interrelationships exist between these different risks, several of which may be present in any one situation.

The environment which gives rise to tbese risks is an ever-cbanging one. Important changes in tbe regulatory and economic environments bave altered banking conditions in the last several years. The "textbook" discussion of banking risks must be applied to current banking conditions to best understand and appreciate the nature of risk management in banking today. When this application is made, it becomes apparent that risk management is growing in complexity and difficulty.

FOOTNOTES

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[2]George H. Hempel, Alan B. Coleman, and Donald G. Simonson, Bank Management (New York: John Wiley and Sons, 1983), p. 4.

[3]Kaufman, op. cit., p. 73.

[4]James H. Jonson, "Notes for a Discussion on the Proliferation of Nonbank Banks," Federal Reserve Bank of Kansas City, April 19, 1983, p. 8.

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[6]"ABA Committee White Paper Spells Out Credit Risks," American Bankers Association Bankers News Weekly, August 27, 1985, p. 11.

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[9]Timothy J. Curry and John T. Rose, "Multibank Holding Companies: Recent Evidence on Competition and Performance in Banking Markets," Journal of Bank Research, Vol. 14:3 (Autumn 1983), pp. 219-220.

[10]John R. Brick, Commercial Banking (Haslett, Michigan: Systems Publications, 1984), p. 17.

[11]Ibid., p. 18.

[12]Robert C. West, Kenneth Spong, and Forest Myers, "Bank Profits In a Changing Environment," Banking Studies: 1984 Annual, Federal Reserve Bank of Kansas City, Vol.2:1 (1985), p. 17.

[13]Emanuel Melichar, Agricultural Banking Experience, Board of Governors of the Federal Reserve System (Washington, D.C.: May 17, 1985), p. 2.

[14]United States Department of Agriculture, Agricultural Finance Outlook and Situation Report, Economic Research Service, (Washington, D.C.: Government Printing Office, December 1984), p. 29;
United States Department of Agriculture, The Current Financial Condition of Farmers and Farm Lenders, Economic Research Service, Agricultural Information Bulletin No. 490 (Washington, D.C.: Government Printing Office, 1985), p. 24.

[15]United Agriseeds, "United Agriseeds Poll of Agribankers and Farmers," May 1985, p. 2.

CHAPTER THREE

RISK MEASUREMENT AND MANAGEMENT

INTRODUCTION

Tbere is a continuous feedback process of evaluating risk exposure and then acting to treat that exposure. Risk measurement and management in banking includes both commmon practices which should be a normal part of a bank's daily operations, and special practices which are implemented at the senior management level.

Risk management needs and capabilities vary among banks and bankers. Bank size, location, clientele, and management responsibility and training are all factors whicb influence tbe degree and type of bank risk exposure, as well as the banker's ability to manage these risks. Needs for sopbistication and specialization in risk management obviously vary among banks. Furthermore, a high degree of sophistication is not necessarily a prerequisite for, nor a guarantee of successful risk management.

This chapter provides a discussion of current risk measurement and management techniques. Emphasis is given to the special practices implemented by senior management, while more limited attention is given to daily practices and principles of risk management that are observed in daily operations. For each type of risk, a brief review of its sources will be followed by

discussions of both its measurement and management. This is followed by a discussion of the many relationships between the risks and the importance of risk management that integrates all risk responses. The final section of the chapter reviews types and sources of risk management literature and mentions concepts from other research which were incorporated into this study.

CREDIT RISK

Credit risk is the risk that borrowers will be delinquent or in default in their repayment of interest and principal. The loan portfolio produces the greatest credit risk exposure, and most credit risk management activities involve the loan portfolio. Therefore, the focus of this section is on the management of the loan portfolio, with relatively less attention given to the management of the other types of lending.

Credit risk can be viewed from both "micro" and "macro" standpoints. The micro standpoint considers the characteristics of individual loans and loan applications in order to determine the likelihood of repayment. The macro view of credit risk considers entire categories of loans and the loan portfolio as a whole in order to determine the effectiveness of current credit policies and to evaluate and address the problems that potential and actual loan losses may create. Management on the micro level is a daily part of every loan officer's job, while management on the macro level is just one of senior management's responsibilities. Micro and macro activities influence each other (e.g., bad loans go from a micro level problem to a macro level problem as they affect the bank's solvency), so micro-macro coordination is

necessary.

Measurement. One type of measure bankers use to determine credit risk exposure is loan delinquencies. A rising level of loan delinquencies would naturally indicate a worsening in the quality of the loan portfolio. Delinquent loans may be classified into different categories, according to length of delinquency. "Thirty days" and "ninety days" are two common classifications, with tbe longer delinquency being more threatening. Some examination may be necessary to determine wbether delinquencies are isolated individual cases or whether these problems indicate a larger tbreat of worsening credit conditions or inadequate loan policies and procedures. Recent studies show tbat the level of farm loan delinquencies has been rising in recent years.[1]

A second indicator of credit risk which banks use is the level of loan losses. Loan losses are also an indicator of the nature of business conditions and the adequacy of lending policies and procedures. Like delinquencies, loan losses may be rooted in individual borrowers' problems or may be indicators of problems on a larger scale.

Specific measures of loan losses include the dollar volume of loan losses and the loan losses as a percentage of all loans. The dollar volume figure measures tbe absolute level of losses and may be compared to tbe bank's capital account to determine its adequacy. The ratio of loan losses to total loans is an indicator of the relative size of loan losses; as the ratio increases, the seriousness of the problem increases. A ratio relatively high in comparison to those of peers might be an

indicator of poor lending practices within that bank, while a historically high ratio for all banks would be more indicative of a worsening of credit conditions in general. Nationwide, loan losses as a percentage of total aasets have generally increased through the early 1980's.[2]

When examiners measure a bank's credit risk exposure, they necessarily begin with an evaluation of the bank's lending policies and its administration of the entire loan portfolio. However, their appraisal eventually requires evsluation of individual loans. Loans are "scbeduled" if they lack legal or technical documentary support or if they represent a concentration of credit in one potentially vulnerable industry.

> "Scheduled loans are classified if they present more immediate risk of nonpayment. Adversely classified loans are more finely divided as to their risk among tbree categories:
> 1) substandard loans are inadequately protected by tbe net wortb and paying capacity of tbe borrower, or the pledged collateral. The bank will likely sustain some loss if deficiencies are not corrected;
> 2) doubtful loans have all the weaknesses of substandard loans but have deteriorated sucb that they have a bigh probability of substantial loss;
> 3) loss loans are considered uncollectible and of little or no value as a bank asset."[3]

The bank's capital account is reduced by the uncollectible portion of tbese classified loana. Therefore, all loss loans are cbarged off and some portion of tbe doubtful loans is slso cbarged off. This is wby credit risk exposure is an important component in determining aolvency risk exposure. Historically, examiners have been adept at detecting problem loans,[4] although a recent survey of Kansas bankers indicates that bankers feel examiner performance could improve.[5]

Forecasts of borrowers' business and economic conditions may

also be used to determine credit risk exposure inasmuch as they determine borrowers' repayment capabilities. A prime example of this for Kansas bankers in 1985 is the condition of the agricultural economy and its effects on farm lending. Farm credit conditions in 1985 are relatively poor and may not improve for some time; one recent nationwide survey of bankers indicates that they perceive the farm recession as a long-term prohlem.[6] These conditions alert bankers to credit risk exposure and signal to them that special attention may be necessary in future management of the agricultural loan portfolio.

On the "micro" level, measurement of the credit risk of individual loans and loan applications is accomplished by the loan review process. Its main objective is to detect problem loans as early as possihle in order to effect whatever treatment possible to prevent a loss from developing.

> "Whatever means are used to conduct the review, the following points should be reviewed:
> 1) financial condition and repayment ability of the borrower;
> 2) completeness of documentation;
> 3) consistency with loan policy;
> 4) perfection of security interest on collateral;
> 5) legal and regulatory compliance; and
> 6) apparent profitability."[7]

Of course, individual loan officers try to observe all of these points when they make loans, but the loan review process provides control and direction in the regular management of the loan portfolio.

Measuring credit risk in the investment portfolio is relatively simple in comparison to measuring risk in the loan portfolio. The task is simpler because many of the securities held

are either rated according to their quality by professional securities graders (e.g., Moody's, Standard and Poor's) or else the securities are issued by the U.S. Treasury or some other federal agency, meaning that there is little chance of default. Security ratings are good indicators of risk since an investigation of each "borrower's" creditworthiness is incorporated into these ratings. Regulatory restrictions prevent commercial banks from owning certain securities which have a greater degree of credit risk, such as medium-quality corporate bonds. Certain municipal bonds and other types of local obligations are the most risky securities owned by a bank, but these securities are usually backed by the taxing authority of some local governmental entity.

Interbank lending activities produce credit risk that can be difficult to measure. There is great variation in credit risk exposure within this broad classification of lending activities. Risk of default on Fed Funds Sold, for example, is quite low, as is the risk of loss in a wire transfer transaction; participation loans with correspondent banks are riskier in comparison. Measurement of credit risk in this and similar situations involve the same principles used in evaluating individual notes in the loan portfolio. Evaluation of other interbank lending activities, like repurchase agreements and bankers' acceptances would require knowledge of the soundness of the other bank's operations and procedures.

Management. Management of credit risk is extensive on both the micro and macro levels.

Daily credit risk management begins with the regular application of established loan policies and procedures. These

are guidelines for loan officers for their daily work, and they also provide a standard for evaluation hy the loan review committee. Daily credit risk management also entails the observance of sound credit evaluation procedures.

> "The essence of all credit analysis can be captured in four hasic credit factors or lines of inquiry:
> 1) the borrower's character;
> 2) the use of loan funds;
> 3) the primary source of loan repayment;
> 4) secondary sources of repayment."[8]

Sound credit evaluation and observance of established policies and procedures are credit risk management practices which must be performed daily.

The loan review process regularly monitors the quality of both loans and the loan-making process. It is a measurement tool in that it provides feedback for hoth loan officers and senior management, but it is a management tool in that it sorts out loans that need special attention and treatment. Loans are examined for their quality using the six factors mentioned earlier. Most banks are unable to regularly review every loan, but every loan with certain characteristics, such as sufficiently large size or sufficiently questionable quality, should he reviewed.

Credit risk management at the macro level involves processes that provide guidance for everyday credit risk management and institute adjustments necessary in special situations. These processes include the formulation and revision of loan policies and procedures, plua decisions on the loan portfolio's diversification, use of participation loans, guaranteed loan programs, and other activities to preserve or improve the quality of the loan

portfolio.

The formulation of a loan policy involves producing a written statement of the bank's general objectives in managing its loan portfolio and an outline of technical principles and procedures to be followed in managing the loan portfolio. This should include a statement of specific procedures and parameters to be observed for each type of loan in the portfolio. The statement of the bank's lending objectives should include "statements about its perceived business role in its trade area, perceived market niche, profitability, maintenance of public confidence, and degree of aggressiveness and competitiveness."[9] The general outline of principles and procedures should include discussions of documentation standards, security interests, problem loan collections, charge-off policy, regulatory compliance, loan pricing, and the loan review process. For each type of loan, the policy should state specific parameters and procedures which include the loan's description and purpose, the preferred maturity, minimum and maximum amounts, security requirements, perfection of collateral, pricing policy, insurance requirements, and any necessary channels of approval.[10]

As part of the risk measurement-management feedback process, periodic revisions in the loan policy may be necessary. As economic, regulatory, and competitive conditions change, both general objectives and specific procedures may be modified. The loan review process, bank examinations, expressions of stockholders' desires, and management's expectations are sll sources of input when considering policy changes.

Diversification is one way that hanks spread credit risk over a large pool of assets. Since not every type of loan would he expected to deteriorate at the same time, the hank is more likely to have some quality loans whenever one certain class of loans deteriorates in quality. The loan policy may even quantify the percentage of the loan portfolio to he held in each loan class (e.g., commercial, agricultural, installment, or any other classification specified). Diversification may he instituted on a geographical hasis so that loan quality and profitability are not suhject to only the success of the local economy. The hank's ahility to diversify in these different ways is dependent upon factors such as hank size, the nature of local markets, the nature of competition, and other factors which would influence its opportunity to lend to new customers.

Participation loans are made for several reasons; these include lack of liquidity, slack loan demand, overline requests, diversification, and risk sharing.[11] Diversification via participation can he accomplished through participation in types of loans not usually made hy the hank. Participation allows a hank to profit from overline requests (individual loan requests which are larger than the hank's legal lending limits). Credit risk may he shared with other financial institutions via participation loans. However, in these circumstances where the horrower's financial condition is questionahle, "the primary emphasis is placed on the marketahility of collateral rather than earnings or financial strength. Extremely close control over the collateral is required."[12] Thus, participation loans may he used to manage credit risk as well as other risks.

Loan guarantee programs are also used in credit risk management. Government agencies, like the Small Business Administration and the Farmers Home Administration, guarantee repayment of a specified percentage of the principal loaned. This limits the bank's exposure to loss on these loans, which are typically made to higher-risk borrowers. Guarantors may also be private entities or individuals who guarantee payment if the primary borrower does not repay. Documentation and investigation of the guarantor's creditwortbiness are very important in these cases.

Further macro management of credit risk involves overseeing loan supervision activities, foreclosure proceedings, and workout procedures. Senior management may need to periodically monitor and adjust these programs to make tbem as effective as possible.

In tbe management of the investment portfolio, credit risk is a nominal factor. Other factors sucb as maturity and marketability of the securitiea are more important since the securities portfolio is maintained as a center for liquidity, not profitability. Simply observing regulatory restrictions takes the bank away from most credit risk, and tbe use of prudent credit evaluation principles, via ratings and other investigations, helps banks avoid other securities having danger of delinquency or default.

The final area of credit risk management is that of interbank lending.

> "Managing interbank credit risk involves these five steps:
> 1) establish a written interbank credit risk policy;
> 2) establish acceptable policy limits for the total portfolio as well as for individual correspondents for interbank credit exposure;

3) conduct a credit analysis of the individual banks with which there is a business relationship;
4) approve credit exposures to banks in compliance with the written interbank credit risk policy; and
5) monitor the interhank credit risk management program."[13]

Thus, the management of interbank credit risk is very similar to the management of credit risk resulting from regular lending activities. Estahlishment of a written interbank lending policy is a rather new concept, but it and all the other concepts of interbank credit risk management are hasically restatements of general credit risk treatments applied to a different type of borrower.

Summary. Credit risk receives more attention in bank management than any other type of risk. Measurement and management must he done by both junior and senior officers, but sound daily practices are perhaps more important in managing credit risk than any other type of risk.

INVESTMENT RISK

Investment risk includes both the risk of capital loss on the sale of securities and the risk of reduced bank net worth resulting from reduced security value. The danger of capital losses is probably the more immediate hazard to Kansas banks, since the risk of reduced net worth is more important to banks whose stock is actively traded, which is uncommon for the majority of Kansas banks.

Measurement. Since interest rate movements are the cause of securities' devaluation, consideration must he given to the volatility of interest rates. Because liquidity needs often necessitate the sale of devalued securities, anticipating liquidity needs is important. The maturity of securities determines

how long they are vulnerable to unexpected changes in interest rates, with longer maturities presenting more danger. A measure called duration gap may also be used to determine the bank's exposure to risk of declining net worth via devaluation of investments.[14]

Because rises in interest rates produce the devaluation of securities which expose the bank to losses, the bank should find it valuable to evaluate potential interest rate changes. Again, it is important to remember that only unexpected changes in interest rates cause problems.[15] This raises the question of bankers being able to "out-guess" the market; if bankers feel they can do this on a regular basis, they may not only immunize their banks against unfavorable rate changes but also position themselves to profit from these changes. Their ability to do this regularly is questionable.[16] What bankers should consider about interest rate changes is their volatility, since more volatile interest rate changes produce greater potential for losses. Interest rate volatility was much greater in the early 1980's than in 1985. More stable conditions have existed since the Federal Reserve changed its method of managing interest rates and the money supply in 1982, but banks should still be alert for economic events which influence interest rates.

Awareness of the nature of the bank's liquidity needs is also important in monitoring investment risk. The sale of devalued securities creates a realized capital loss for the bank. The nature of the need determines whether selling securities is the most appropriate response. The predictability and volatility of withdrawal and loan demands are important gauges of

investment risk since they are major factors in determining the bank's liquidity needs. The greater the availability of other liquidity sources outside the investment portfolio, the less is the investment risk exposure.

The maturity of securities in the investment portfolio is another measure of investment risk exposure. Maturity determines how much time is available for unexpected interest rate changes to occur -- the longer the maturity, the greater the risk of an unexpected rise in interest rates occurring before bond maturity.

There are several different ways to view the maturities of securities when measuring investment risk. These methods of evaluation include a basic gap model, more sophisticated gap models with added "maturity buckets," and a number of duration gap models. However, gap models also consider the maturities of several other types of financial instruments held by the bank and these models are used to control much more than investment risk. Because the management of other risks involves the manipulation of the investments' maturities, investment risk exposure may sometimes be higher than desired; this risk exposure trade-off, however, may be acceptable to management.

Management. Several decisions must be made before instituting specific steps for investment risk management. First, the priority of investment risk relative to other risks must be determined since management of the investment portfolio is an important factor in the management of other types of risk, notably liquidity and cost of funds risks. The banker must also decide whether risk of reduced net worth or risk of realized

capital losses is more important; the nature of bank ownership is an important factor in this decision. Finally, the banker must decide whether to attempt to anticipate interest rate changes. Once these decisions have been made, the bank may then institute any number of investment risk management actions.

One option in investment risk management involves the management of the composition of the securities portfolio with respect to maturities. Shorter maturities result in a shorter time that the bank has investments locked into a certain rate of return. Also, a given rise in interest rates produces a smaller devaluation for bonds that have shorter maturities. In periods of volatile interest rates, as in the early 1980's, maintaining very short maturities proved to be the best management strategy since this minimized the effects produced by a rise in interest rates.

The banker's preference for taking risk will influence the strategy for management of bond maturities. A more speculative banker would not necessarily keep maturities as short as possible and would be profiting from such a strategy under 1985 conditions. A more risk-averse banker would maintain shorter maturities in order to minimize the adverse effects of a rise in interest rates. Of course, it is important to remember that manipulation of bond maturities is subject to other risk management constraints.

Liquidity management is often a constraint on investment risk management. The bank is obligated to meet withdrawal demand and must make loans to function as a profitable financial intermediary. Investment risk problems may be superceded by the

bank's liquidity needs. Management of investment and liquidity risk must often be done simultaneously.

Summary. Investment risk is spawned by a variety of factors and may be treated in a variety of ways. Interest rates, bond maturities, and liquidity needs are all factors in this process. Liquidity risk and cost of funds risk are also managed with the investment portfolio, so investment risk management may become a secondary goal in overall risk management.

LIQUIDITY RISK

Liquidity risk is the risk that the bank will be unable to meet demands for funds. There is also a micro-macro distinction in the management of liquidity risk; the micro or daily management of the bank's money position is done as a matter of standard operating procedures, while macro liquidity management involves making and implementing longer-run strategies. Over the longer run, there are three different types of liquidity needs: seasonal, cyclical and trend.[17] Each type of liquidity need may require a different response, so proper diagnosis of a liquidity problem is a major part of its treatment.

Banks must meet immediate obligations such as withdrawals and legitimate loan demands. A bank is also obligated to meet reserve requirements. A banker does not want to maintain a larger liquidity reserve than necessary since this would result in an excess of low or non-earning assets and lower long-run profitability. On the other hand, too small a liquidity reserve may result in severe financial problems and even failure.

Clearly, a bank can benefit by competent liquidity measurement and management.

Measurement. Proper evaluation of a liquidity need is necessary to best determine the appropriate response to that risk. Since a wide variety of responses to liquidity risk are available, an early and accurate diagnosis is valuable. "The best guides available to most banks are their past experience and knowledge of events likely to affect liquidity needs."[18] Specific guides include both quantitative measures, consisting of several ratios, and qualitative measures, which include the experience and knowledge of past liquidity needs and treatments.

Quantitative measures include some ratios which relate liquidity needs to the liquidity reserves available. A ratio appropriate for evaluating short term liquidity risk is the short term assets/short term liabilities ratio. It relates relatively liquid reserves to relatively short term uses. However, some short term assets are used to meet the bank's reserve requirements "and are not liquid assets which may be used to meet loan demands or deposit outflows."[19] Thus, an individual bank may refine its short term ratio to some sort of "sensitive sources/sensitive uses" ratio.[20] Again, these measures would be most effective in monitoring liquidity risk on a short term or seasonal basis.

To examine longer term or trend liquidity risk, the loan/deposit ratio would he more appropriate, since it relates the bank's primary use of funds to its primary source of funds. A higher loan/deposit ratio would indicate less liquidity available for unexpected trends of greater liquidity need.

Some quantitative measures of deposit charactersistics are helpful in determining liquidity needs. Some deposits are more prone to withdrawal on short notice; competitive conditions, size, and interest rate sensitivity of deposits influence deposit volatility. The ratio of time deposits/total deposits shows the importance of time deposits, which may he sensitive to interest rate changes. A bank may develop similar indicators of the volatility of other deposits since its own demand deposits, savings deposits, and certificates of deposit may have different degrees of volatility.

Another consideration in liquidity risk measurement is the composition of the investment portfolio. The composition of the investment portfolio considers the availahility of securities which may not he sold to provide liquidity. Not all securities are availahle for immediate sale. Some are pledged against public deposits, some lack a suitahle secondary market, and others may produce an undesirahle capital loss if sold.

Trends in the use of purchased liquidity (i.e., purchasing Fed Funds from another bank or borrowing from the Federal Reserve discount window) are an indicator of the liquidity of the rest of the bank's resources. Extensive use of Fed Funds or horrowing from the Federal Reserve discount window when the bank is not in a period of seasonal shortage indicates that the bank's other liquidity reserves may be low; purchasing liquidity is quite acceptable in periods of seasonal shortage, hut regulators frown upon its extensive use beyond these periods.

Management. Meeting the hank's reserve requirements is a

necessity.

> "The philosophy in managing the required reserves portion of a bank's money position is usually just to meet the bank's required reserves with acceptable assets. . . . By 1988, acceptable assets will include only vault cash, deposits at the Federal Reserve, and pass-through accounts to the Federal Reserve."[21]

Banks typically meet any shortfalls here through the use of purchased liquidity.

Over a somewhat longer time span, seasonal liquidity needs may appear. The timing and extent of seasonal liquidity risk may he unique for each hank and past experience is perhaps the best gauge of this type of liquidity risk. Although purchased liquidity is an acceptable response for seasonal liquidity needs, seasonal needs could also be met from the sale of loans or the maturing or sale of securities from the investment portfolio, or through participation loans.

Over an even longer time span, trend liquidity needs may develop. "These longer term liquidity needs are generally related to the secular trends of the community or market that a bank serves."[22] If predicted loan growth ia greater than predicted deposit growth, then the bank must find new sources of liquidity or else have its liquidity position weakened. One response would be to raise the loan/deposit ratio. However, this action may change the bank's capital adequacy. The bank could also become more selective in its lending in an attempt to curb loan growth. Purchased liquidity is not regarded as a viable alternative for meeting trend liquidity needs since the bank should meet these permanent liquidity changes with its own resources, not the resources of others.

Another important element in the liquidity management process is the investment portfolio. Management of marketability and maturity of securities are the controls the bank has to maintain adequate liquidity in the investment portfolio. Three formalized strategies exist for the management of the maturity structure of the investment portfolio; these are the "laddered" approach, the "barbell" approach, and the "buffer" approach.[23] The laddered strategy involves staggering maturities such that approximately the same amount matures each year, while the barbell approach lumps maturities at either end of the maturity spectrum. The buffer approach concentrates maturities at the short end of the maturity spectrum. The buffer approach is the best alternative for periods of high liquidity risk because

> "with a high concentration of securities in the short end of the maturity spectrum the bank has greater liquidity with which to cope with tight credit conditions, strong loan demand, deposit outflows, or a sharply rising cost of funds."[24]

The shorter maturities of the buffer approach are also consistent with a risk-averse investment risk management strategy.

Summary. Liquidity risk measurement and management are the processes of identifying the nature of liquidity risks and instituting the appropriate procedures to treat them. Liquidity needs may be daily, seasonal, or even longer-term in nature, and different responses may be necessary in each of these cases. Management of liquidity risk may involve both limiting the flow of funds from the bank and tapping new liquidity reserves within the bank. The liquidity risk management process is necessary to ensure that the bank can meet its obligations of providing funds

for its customers in a timely fashion.

COST OF FUNDS RISK

Cost of funds risk is the risk of unfavorable changes in the bank's cost of funds. Changes may be unfavorable when costs go up faster than earnings or when costs do not decline as quickly as earnings. Some refer to this risk as "income risk," since both earnings and costs of funds are factors in determining the effects on bank income resulting from changes in interest rates. Income risk has been defined as "the risk of loss in net interest income [resulting] from movements in borrowing and lending rates not being perfectly synchronized."[25] Whatever the name used, this risk is a danger to banks' profitability.

Measurement. Cost of funds risk is monitored with a number of measures, including gaps, spreads, and ratios. Gap models with varying degrees of sophistication exist and are coming into more common use. Spreads have been monitored for years. The composition of the loan and investment portfolios with respect to maturity and yield and the sensitivity of deposits to interest rate changes are measures for cost of funds risk. The most sophisticated measures may not be necessary; some bankers feel they can monitor risk with simpler, less costly models.

Gap models incorporate the size and maturity or duration of both interest-sensitive assets and liabilities. They predict the effects on the bank from both rising and falling interest rates, both of which may be beneficial or damaging. The banker must decide whether to actively manage the gap, which would produce profits if interest rate changes are forecast accurately, or to

immunize the bank against any negative effects caused by interest rate changes. In deciding which gap model to use, bankers must also evaluate their own needs and capabilities for maintaining such a system. Some smaller banks may have neither the need for nor the capahility of instituting the more sophisticated systems.

The basic gap model derives its name from the "gap" between the dollar amounts of rate-sensitive assets (RSA) and rate-sensitive liabilities (RSL) for a given time horizon (GAP = RSA - RSL). To hedge against interest rate changes, this model suggests setting GAP equal to zero. A rate change would influence interest income and interest expense equally and oppositely and leave profits unchanged. A positive gap would prove heneficial in times of rising rates and undesirable in periods of falling rates; these conditions would be reversed for a negative gap. Most bankers in the Tenth Federal Reserve District have typically maintained positive gaps over the last several years.[26]

More sophisticated models have been designed to correct shortcomings in the basic gap model.

> "A major prohlem with the basic gap model is that it computes GAP as the difference between RSA and RSL regardless of when the assets and liabilities are repriced within the gapping period."[27]

More sophisticated gap models divide the gapping period into several subintervals, measure the gap within each of these shorter repricing periods, and sum the gaps for each of these smaller intervals or "maturity buckets," to find the cumulative gap for the whole period. This refinement reduces the prohlem of differing maturities but does not eliminate it.

Duration gap models provide another measure of cost funds risk. Instead of dividing assets and liabilities into different maturity buckets within the entire gapping period, the duration of all rate-sensitive assets and liabilities are considered in one calculation which eliminates the repricing question. The formula for the duration gap having net interest income as its target account is

$$DG = MVRSA(1 - D_{RSA}) - MVRSL(1 - D_{RSL})$$

where: DG = duration gap (a dollar value);

MVRSA = market value of rate-sensitive assets at the beginning of the gapping period;

MVRSL = market value of rate-sensitive liabilities at the beginning of the gapping period;

D_{RSA} = the duration (the weighted average time to repricing) of RSA; and

D_{RSL} = the duration of RSL.[28]

The larger the duration gap becomes in absolute value, the greater the cost of funds risk exposure becomes. As defined here, a positive gap will have analagous effects to the positive gap in the basic model.

Two other measures of cost of funds risk that are quite similar are spread and net interest margin. A bank's spread "is the difference between interest returns (interest revenues divided by earning assets) and interest costs (interest expenses divided by interest-bearing funds)."[29] The spread thus shows how much of an interest rate margin the bank has to cover its non-interest costs and profits, and how much buffer exists for unexpected increases in costs of funds. Average net interest margin equals gross interest revenue as a proportion of average assets minus gross

interest expense as a proportion of average assets. Average net interest margins for banks having less than 300 million dollars ranged from 4.19 to 5.20 percentage points from 1976 to 1983.[30]

Factors influencing cost of funds risk which are exogenous to the bank are the behavior of interest rates and the conditions which influence them, the nature of the bank's competition, and the sensitivity of a bank's deposits to interest rate changes. The bank can only anticipate market interest rate changes from the conditions that produce them; it cannot control those conditions itself. Competition is important in that it influences the sensitivity of the bank's deposits to changes in interest rates as banks compete for funds on a pricing basis.

Management. Management of cost of funds risk involves the manipulation of the factors which influence the bank's risk exposure. These are maturities or durations of both assets and liabilities, and the rates received or paid on these accounts. The use of financial futures contracts is another innovation in cost of funds risk management which may be incorporated into the various gap models. Another important tool is the variable rate loan, which shifts the risk from the bank to the borrower. Bankers may use several of these responses in their treatment of cost of funds risk.

Managing the bank's gap involves several steps. First, the bank must decide which model is best for its needs and most feasible in its operations. The basic gap model is the most simple model; more complex gap models with more maturitiy buckets are next; the duration gap model with net interest income as the target account is probably the most complex.

Tbe desired gap would be created through the sale or purchase of loans, securities, financial futures contracts, or Fed Funds, or througb the manipulation of the prices and maturities of botb assets and liabilities. The gap management process would begin anew as tbe new gap would be calculated, new forecasts made, and additional actions taken to create the new desired gap. Since asset and liablility pricing and maturities, and sales and purcbases of other instruments are subject to other risk management considerations, decisions must be integrated into an overall risk management strategy.

Financial futures contracts transfer cost of funds risk away from tbe bank witbout transferring it to tbe borrower. Financial futures are used in a bedging gap strategy wbere tbe value of the futures contracts bougbt or sold is combined with tbe other accounts to produce a gap which is immunized against cost of funds risk. However, practical problems have limited the adoption of financial futures. Since knowledge of the precise amount to be hedged is a requirement, a fairly complex gap model is necessary. Margin calls may make tbe process costly; some expertise in futures trading is necessary, too; therefore, only larger banks typically use financial futures. Unfavorable regulatory and accounting treatments make tbem less attractive, as well.[31]

Management of the bank's spread or net interest margin also involves the pricing of both assets and liabilities. Bankers who do not use other measures such as gaps to manage cost of funds risk may necessarily maintain a bigher spread to offset the lack of protection otherwise offered by gap management. Net interest

margins for smaller banks are typically wider but more variable than those of large regional or money center banks.[32] Competitive or economic forces working to narrow the spread may prompt bankers to charge higher service fees to cover noninterest operating costs, since the narrower spread indicates that there is less interest margin to cover these costs. Research indicates that noninterest income as a percent of total assets has risen in recent years.[33]

Finally, variable rate loans are important tools in transferring cost of funds risk away from the bank. These loans allow the bank to adjust its loan rates whenever interest costs change. However, variable rate loans pass the cost of funds risk on to the borrower; this may then increase the bank's credit risk exposure. The banker must decide whether this is an acceptable trade-off in the management of the variable rate loan program.

Summary. Cost of funds risk is an important risk in that it greatly influences bank profitability. A number of measurement and management techniques have been developed to reduce banks' exposure to this risk. These procedures vary in complexity and effectiveness. Each banker must decide which procedures will provide the best results. New techniques for cost of funds management may even allow the bank to profit from changes in interest rates that previously would have been harmful.

SOLVENCY RISK

Insolvency occurs when the bank's capital becomes inadequate as its asset values decline relative to the value of claims

against the bank. Insolvency may be the product of problems in different areas of the bank. Loan charge-offs and other losses resulting from investment, liquidity, and cost of funds risk exposures reduce bank capital. Internal earnings as a source of capital may be impaired by these losses. Loan and deposit growth may be great enough tbat the capital is rendered inadequate without special measures to supplement it. Several measures of solvency risk monitor the adequacy of the capital account directly or indirectly by monitoring other types of risk. Management of solvency risk deals directly with the capital account as well as otber types of risk.

Measurement. A number of ratios are used to determine capital adequacy. These ratios measure the adequacy of the bank's capital by comparing the capital account to other accounts and by monitoring other accounts and activities that affect tbe capital account.

Ratios which directly monitor the adequacy of the capital account include capital/assets and classified assets/capital.[34] Of these, the capital/assets ratio is the most commonly used ratio. Asset devaluation is a major insolvency risk, this ratio is useful because it shows how much asset devaluation would produce insolvency.

The classified assets/capital ratio measures capital adequacy by comparing the assets of lower quality to tbe capital account. Some portion of tbese assets will be cbarged off against capital wben bankers or examiners decide they are worthless, and capital must be adequate to cover these losses.

Measures for other types of banking risk are also valuable

in evaluating solvency risk exposure. Perhaps the most important of these monitors credit risk exposure since bad loans are directly charged off sgainst capital. Cost of funds risk is important in determining capital adequacy since earnings are a major source of capital and cost of funds risk can produce major earnings problems. The loan/deposit ratio might even be considered a measure of capital adequacy since a relatively higher ratio would indicate that the bank was investing more in riskier assets (i.e., loans) relative to claims against the bank. Risky assets would require more capital in the bank's financial structure. A 1980 study indicates that less risky banks are able to maintain lower capitalization levels.[35]

In evaluating capital adequacy, examiners also consider qualitative factors such as the quality of management and operating procedures, the nature of competition and its effects on the bank's operations, and the nature of bank ownership.[36] These factors are considered because of their influence on overall bank operations and, thus, capital adequacy.

Management. Management of solvency risk involves maintaining capital adequacy through both capital infusion and management of the other factors affecting capital adequacy. Credit risk management could even be considered an indirect form of solvency risk management. Indeed, every other risk management procedure which bolsters profits could be indirectly considered solvency risk management, since retained earnings are banks' most important source of capital.[37] Thus, there are both direct and indirect treatments for solvency risk.

A number of direct treatments are available to enhance the adequacy of the bank's capital. When solvency risk is perceived to be greater, infusion of capital may come from both external and internal sources. Public stock issues were the most important source of external capital for large bank holding companies in the 1970's; other sources included capital of acquired banks, debt conversions, and employee stock plans.[38] If the bank is closely held, as are many banks in Kansas, existing owners would be the primary source of capital since no active market would be readily available for selling stock. Regulators may consider subordinated debt as capital if it meets certain requirements. However, a loss "cannot be charged against debt capital in order to maintain the bank as a going concern,"[39] so the use of subordinated debt capital may be limited. The nature of the infused capital would depend on the nature of the need for capital.

The internal source of capital for a bank is the earnings it generates through normal operations. Some earnings are retained and reinvested in the bank rather than being paid out to owners as dividends. Thus, both profitability and dividend policy influence the internal generation of capital. Dividend policy may be conditional on the nature of bank ownership; if the bank's stock is not actively traded, payout policy may be more discretionary. Dividends may be restricted in crisis conditions to provide necessary capital for the bank.

Indirect management of solvency risk involves maintenance of profitability through both sound daily operating procedures and competent risk management on a macro level. Credit risk

management is quite important since loan charge-offs are a major threat to the bank's capital. Cost of funds risk management helps maintain profitability, particularly during periods of volatile interest rates. Sound operations also inspire confidence from depositors and regulators.

Summary. Solvency risk measurement and management work to ensure that the bank's capital remains adequate. Management involves the infusion of capital from external sources when necessary, and the generation of capital from internal operations. Internal operations which are both profitable and safe are thus important factors in solvency risk management.

REGULATORY RISK

Regulatory risk results from changes in the regulatory environment. It differs from other risks in that regulatory risk frequently creates other types of risk for the bank. This being the case, regulatory risk measurement and management are different in nature from most other measurement and management techniques used by banks. Regulatory riak measurement is much less quantitative, and regulatory risk management is typically done by groups of banks rather than by individual banks.

Measurement. No ratios, indices, gaps, spreads, or other amounts are used to measure a bank's regulatory risk exposure. Qualitative indicators of regulatory risk do exist, however, and bankers may rely on these sources plus their own intuition to forecast the effects of potential regulatory changes.

Indicators of regulatory risk come from regulators, the

banking industry itself, and legislative bodies. Regulators have knowledge of proposed regulatory changes and should understand how any procedural change will function and what the likely effects of these changes will be. Thus, regulatory publications and contacts are important sources of information. Similarly, banking industry publications and contacts provide valuable information on both the implementation and the effects of regulatory changes. Finally, legislative activities and contacts are important sources of information, particularly since it is local, state, and national legislative bodies which enact many of the regulatory changes.

Management. The individual banker is often a spectator watching the regulatory environment change, with little individual power to control the ultimate changes. Some bankers may act collectively, however, to influence potential regulatory changes.

Several banking organizations exist for purposes which include lobbying for causes important to the banking industry. The American Bankers Association (ABA) is the largest banking organization in this country. The ABA and other smaller banking organizations with narrower interests lobby in Washington for banking causes. One prime example of the influence of the banking industry is the repeal of the interest income withholding law in 1983 which came after intense protests by banks and other financial institutions. State-wide organizations like the Kansas Bankers Association provide state legislators with input from the banking community.

Different interest groups within the state's banking industry have formed to lobby for their own interests, as was the case

in the multihank holding company debate in Kansas in the 1980's. Contrihutions to and support of these groups or other political action committees are in many cases the only options an individual hanker has in influencing the writing of new regulations.

Although individual bankers may not have much voice in writing regulations, they may anticipate these regulatory actions and take steps to deal with the changes caused hy the new regulatory environment. Development of legislative, industry, and regulatory contacts may allow hankers to hetter anticipate regulatory changes, evaluate the effects of these potential changes, and institute measures to deal with these new conditions. Anticipation of the effects of regulatory changes could he important in allowing time to develop strategies to cope with a new hanking environment.

Summary. Regulatory risk is thus a unique type of risk, with unique methods of both measurement and management. Its measurement is qualitative in nature, and its management is unique in that individual hankers can do little to reduce risk themselves; their only option is to anticipate it and respond to it as hest they can. Collectively, bankers may have some influence on the regulatory process. Regulatory changes may affect each hank differently, depending on the nature of the regulatory change and the hank's size, location, markets, competition, and other characteristics.

SUMMARY OF OVERALL RISK MANAGEMENT

Many interrelationships exist hetween the risks in the overall operation of the hank. The different types of risk are not

all treated in an individual, isolated fashion but are managed together when necessary. Bank goals other than risk minimization must also be considered.

The interrelationships between the risks are many. One important relationship is between credit risk and solvency risk; loan losses result in charge-offs against capital. All other risks influence the level of solvency risk exposure, too, inasmuch as they affect profitability and safety, which in turn affect capital adequacy. Regulatory risk works in the opposite manner -- it may be the root of other types of risk. Investment risk, liquidity risk, and cost of funds risk are all intertwined in the management of the investment portfolio, gaps, spreads, and maturities. Cost of funds risk and credit risk interact through variable rate loans. The point is clear: risk management should integrate all relevant factors into the treatment of risk.

Other bank goals are also necessary considerations when choosing the best methods of risk management. One important bank goal is profitability; bankers must decide how much risk is acceptable and how much profit is necessary. Examiners also limit risk-taking through minimum captialization levels, monitoring of purchased liquidity, and routine loan reviews. A second major bank goal to be considered is service of the public interest. In the short run, some risk management may not seem to serve the public's interest, at least in some customers' eyes. One example of this is foreclosure. A bank could receive negative publicity if a borrower claims that work-out is still possible. The perception would be created that the bank is interested only in

profits and not in its customers. The bank must decide when its own interests supercede some individual's interests. In the long run, however, there is really no conflict, since sound risk management inspires public confidence by producing safe operations, sound financial markets, and efficient intermediation services.

REVIEW OF RISK MANAGEMENT LITERATURE

There is a great body of literature concerned with risk management in banking. The banking industry and the academic community each have a number of publications serving their own particular interests. Numerous textbooks also provide discussions of risk management in banking. Many empirical studies have already been cited in this chapter, and many more empirical studies may be found in the publications listed below. Several theoretical discussions of banking risk management have also been mentioned, and many others may also be found in the following sources.

Several periodicals are oriented toward providing the banking industry with information on risk management. A list of these includes The Bankers Magazine, The Magazine of Bank Administration, Savings and Loan News, American Bankers Association Banking Journal, and numerous Federal Reserve System publications. While these periodicals all contain empirical research on the use of risk management procedures (several of them have been cited in this report), their primary concern is providing bankers with instruction on the implementation of risk management procedures, rationale for these practices, and the probable

consequences of various risk management options. These types of articles provide bankers with more practical information for bank operations rather than empirical research, as would an academic journal. Several articles from these publications have been cited in this study, but most articles emphasize practical application for the banking industry.

Publications having greater emphasis on empirical research on banking risk management include The Journal of Bank Research, The Journal of Money, Credit, and Banking, The Journal of Commercial Bank Lending, and The Journal of Finance. The Federal Reserve System is also a source of empirical research. Articles on risk management in these publications tend to focus on very specific areas of risk, such as the effects of changing interest rates, the effects of changing regulations, and risk in the loan portfolio. Articles from some of these publications have also provided information for this study.

Numerous textbooks cover all areas of risk measurement and management. Much of their information is compiled from that found in the periodicals and journals just mentioned.

Certain concepts from other research were incorporated into this study. This study's examination of financial information required from agricultural borrowers was inspired by a similar examination in a 1977 Louisiana State University study.[40] Parts of Booth, Smith, and Stolz's study of the use of financial futures contracts was also adapted for this research.[41] This study's examination of loan renewals and security requirements was inspired by similar studies by the Federal Reserve Bank of

Kansas City.[42] Finally, examination of gaps and spreads in this report incorporated certain aspects of Mitchell's research on Tenth Federal Reserve District banks.[43]

This study of risk management is unique in many ways, however. A review of risk management literature revealed no studies which examined risk management from such a broad perspective as this report does; most empirical research tended to focus on very specific areas of risk management. This study is unique in its examination of perceptions of the relative importance of all risks and the relative importance of measures of all types of risk. No other studies were found which examined the extent of use of risk management practices in the same fashion as does this paper. Thus, this report is original in many aspects of its examination of risk management.

FOOTNOTES

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[2]Robert C. West, Kenneth Spong, and Forest Myers, "Bank Profits in a Changing Environment," Banking Studies: 1984 Annual, Federal Reserve Bank of Kansas City, Vol. 2:1 (1985), p. 16.

[3]George G. Hempel, Alan B. Coleman, and Donald G. Simonson, Bank Management (New York: John Wiley and Sons, 1983), p. 301.

[4]Kenneth Spong and Thomas Hoenig, "Bank Examination Classifications and Loan Risk," Economic Review, Federsl Reserve Bank of Kansas City, Vol. 64:6 (June 1979), p. 25.

[5]Kansas Bankers Association, "Kansas Bankers Association Regulatory Examination Survey," October 29, 1985.

[6]United Agriseeds, "United Agriseeds Poll of Agribankers and Farmers," May 1985.

[7]Hempel, Coleman, and Simonson, op. cit., p. 295.

[8]Ibid., p. 305.

[9]Ibid., p. 291.

[10]Ibid.

[11]John R. Brick, Commercial Banking (Haslett, Michigan: Systems Publications, 1984), p. 94.

[12]Ibid.

[13]"Steps Point Way to Managing Interbank Credit Risk," American Bankers Association Bankers News Weekly, August 27, 1985, p. 11.

[14]George G. Kaufman, "Measuring and Managing Interest Rate Risk: A Primer," Economic Perspectives, Federal Reserve Bank of Chicago, Vol. 8:1 (January-Febuary 1984), p. 20.

[15]Alden L. Toevs, "Gap Management: Managing Interest Rate Risk in Banks and Thrifts," Economic Review, Federal Reserve Bank of San Francisco, Spring 1983, p. 25.

[16]Richard Brealey and Stewart Myers, Principles of Corporate Finance (New York: McGraw-Hill, 1984), p. 280.

[17]Hempel, Coleman, and Simonson, op. cit., p. 218.

[18]Ibid.

[19]Ibid., p. 214.

[20]Ibid., pp. 219, 274.

[21]Ibid., p. 214.

[22]Ibid., p. 223.

[23]Brick, op. cit., p. 301.

[24]Ibid., p. 303.

[25]Karlyn Mitchell, Interest Rate Risk Management at Tenth District Banks," Economic Review, Federal Reserve Bank of Kansas City, Vol. 70:5 (May 1985), p. 4.

[26]Ibid., p. 15.

[27]Toevs, op. cit., p. 22.

[28]Ibid., p. 303.

[29]Hempel, Coleman, and Simonson, op. cit., p. 487.

[30]Mitchell, op. cit., p. 12.

[31]James R. Booth, Richard L. Smith, and Richard W. Stolz, "Use of Interest Rate Futures by Financial Institutions," Journal of Bank Research, Vol. 15:1 (Spring 1984), p. 19.

[32]Mitchell, op. cit., p. 12;
Duane B. Graddy and Adi S. Karna, "Net Interest Margin Sensitivity Among Banks of Different Sizes," Journal of Bank Research, Vol. 14:4 (Winter 1984), p. 289.

[33]West, Spong, and Myers, op. cit., p. 15.

[34]Hempel, Coleman, and Simonson, op. cit., p. 139.

[35]Richard R. Dince and J. C. Forston, "Bank Examination, Capital Adequacy, and Risk," The Bankers Magazine, May-June, 1980, p. 54.

[36]Hempel, Coleman, and Simonson, op. cit., p. 139.

[37]Ibid., p. 123.

[38]Gregory E. Boczar, "External Sources of Bank Holding Company Equity," Magazine of Bank Administration, February, 1979, p. 42.

[39]Hempel, Coleman, and Simonson, op. cit., p. 147.

[40]R. Bruce Johnson and Shelton J. Miller, "Farm Lending Practices of Commercial Banks in Louisiana," Department of Agricultural Economics Research Report No. 520, Louisiana State Universty, June 1977, p. 40.

[41]Booth, Smith, and Stolz, op. cit., p. 19.

[42]Federal Reserve Bank of Kansas City, Financial Letter, Vol. 11:2 (February 1985), p. 2.

[43]Mitchell, op. cit., pp. 12, 16.

CHAPTER FOUR

DESCRIPTION OF METHODOLOGY

INTRODUCTION

This chapter provides a review of the rationale used in designing this study as well as more specific descriptions of the survey instrument and the statistical analyses used. The discussion of the rationale for this study includes a review of the nature of the problem, the research alternatives available, and why the chosen avenues were deemed most appropriate for achieving the study's objectives. The description of the survey design includes discussions of the general areas of inquiry, the general types of questions used, and the purposes of the individual questions. The statistical analysis section involves discussions of the types of tests used.

DATA COLLECTION: GENERAL METHODOLOGY AND RATIONALE

The discussion of methodology evaluates the type of information-gathering instrument used, the rationale for its design, and the group of bankers from which the data was collected. This discussion necessarily involves a review of the study's objectives, the constraints imposed by the nature of the problem, and the advantages and disadvantages of each of the alternative methods of study.

As outlined in the introduction of this paper, the study's objectives are to:

1) determine which risks hankers perceive as most important, and why they perceive them as such;
2) examine how hankers measure the different risks they face;
3) examine how hankers respond to these risks;
4) examine how these measurement and management practices have changed over time; and
5) examine differences in practices and performance among different types of hanks.

Thus, the information-gathering instrument was selected and designed with these ohjectives in mind. The survey group was chosen similarly.

The study of hanking risks imposed certain constraints on the research options availahle. Quantifying the preferences for risk measurement, opinions on the importance of risk, and the extent of risk responses was the greatest constraint. Ranking and rating schemes were used in these situations to create ordinal data. Only certain nonparametric analyses are acceptable for viewing some statistical relationships for this type of data.

Two major decisions in the data collection process concerned the method of collection and the group of hanks from which the data were to be collected. The alternative methods of collection were surveys and personal interviews. Two advantages of using a survey were the greater numher of responses received and the relatively smaller time requirement. One disadvantage of the survey method was the inahility to ask complex and follow-up

questions. Another disadvantage was the lack of control over the number, the completeness, and the correctness of responses. Interviews offered the advantages of more in-depth questioning and greater control over the number and nature of respondents questioned -- that is, a "representative" sample could have been defined and interviewed. Disadvantages of interviewing included the narrower base of respondents questioned, the greater time requirement of the interview process, and the difficulty of defining a representative sample of banks.

The alternatives considered with regard to the type of banks surveyed were: 1) to question only agricultural banks within the state of Kansas, since this group was perceived as facing the greatest problems at the time; and 2) to question all Kansas banks, both agricultural and otherwise. Under the second option, the performance and practices of agricultural and nonagricultural bank could be compared. This option would also provide broader responses with respect to the size of respondent banks.

The options chosen for this study were to survey all Kansas banks. A survey was deemed to be the best alternative for a number of reasons. First, a greater number of responses would be obtained via a survey, and with the diversity of banking practices in the state, a survey would be more likely to capture a diversity of answers, compared to a limited number of interviews. Questions with sufficient detail could be asked in a survey format; in-depth explanations feasible only in interview situations were not deemed necessary. Finally, the survey alternative was also deemed to have a smaller time requirement.

The group surveyed included the entire population of Kansas banks. This group was chosen over the subset of the state's agricultural banks because of the greater diversity of information received and the availability of nonagricultural banks as a group for comparison to the agricultural banks. Surveying all banks was preferrable to questioning a "representative" sample because of the difficulty of defining a representative group and the greater information provided by a larger group of respondents.

DESIGN OF SURVEY AND SAMPLING METHODS

Five general areas of inquiry were established in the design of the questionnaire. These areas for the most part paralleled the study's objectives. The survey design process also involved the selection of the types of questions used on the questionnaire. The next step in the process was the formulation of the individual questions. This was followed by an informal pre-test designed to solicit suggestions for improvement. The survey itself was also designed to encourage response. The objective was to produce a survey that would be understandable to the respondents and informative for the researcher.

General areas of inquiry. The five general areas of inquiry on the questionnaire were:

1) bank characteristics;
2) identifying risk;
3) measures of risk;
4) risk responses; and
5) the agricultural lending function and risk responses.

The objective of examining changing practices over time was incorporated into questions within each of the other areas of inquiry.

The hank characteristics section solicited information on size, location, nature of ownership and charter, and other factors which described the respondent hank. These characteristics were useful in the classification of hanks when analyzing how different types of hanks managed their operations. Questions in the risk identification section were designed to determine which risks hankers perceived as most important, how these perceptions had changed over time, and why these perceptions were held. The risk measurement section inquired ahout risk management tools used hy hankers, how the use of these tools had changed over time, and which risks the hankers perceived as being the most difficult to measure. The risk response section examined the use of various risk management procedures and how the use of these responses had changed over time. The section for risk responses in agricultural lending solicited information on the importance of agricultural lending to the hank and on the specific responses to risk originating in the agricultural loan portfolio.

Types of questions. Several different types of questions were used to gather the information from the hanks. In many types of questions the respondent was instructed to rank various factors from the most important to the least important. This rating scheme was used in instances where it was necessary to determine the factors' relative importance to each other. Another type of quesion asked the respondent to rate the importance

of various factors. These rating schemes were used to measure the importance of each factor without the same sort of direct comparison among the factors as in the ranking questions.

A third method of inquiry appeared in many of the rating and ranking questions. The respondent was provided the opportunity to write in and rank or rate factors not mentioned on a particular question. These opportunities were provided to allow bankers to mention any factors not considered by the researchers in the formulation of the questionnaire.

Types of questions used to determine bank characteristics were "YES-NO" questions, questions where the respondent was simply to "check" or "circle" some factor, and fill-in questions where the respondent was to write some amount or number as the situation required. No essay questions were used because of the difficulty in categorizing essay responses and the barrier essay questions would have presented to quick completion of the questionnaire.

Formulating individual questions. The process of formulating the individual questions was a lengthy one. The questionnaire had to be understandable to the respondent and analytically valuable to the researcher. The questionnaire went through several drafts before these objectives were deemed to be satisfied. A copy of the questionnaire is in Appendix A for reference.

The first area of inquiry, "Bank Characteristics," contained eight questions, all of which were fill-in or check questions. The first four questions solicited information on size, capital adequacy, liquidity preferences, and profitability. Questions 2 and 3 dealt with capital/asset and loan/deposit ratios, both of

both of which may be used as indicators of risk preference. Question 5 determined the nature of the bank's charter; Question 6 examined the nature of bank ownership. Question 7 determined the bank's location, since geographical differences were to be analyzed. The final question of the section, Question 8, determined the experience of the chief executive officer to permit analysis of differences in management practices as management experience varied.

The next section, "Identifying Risk," contained five questions. Question 9 asked for a ranking of the six banking risks to determine their relative importance in risk management decision-making; a ranking was requested for five years ago, three years ago, today and two to three years in the future. An opportunity was provided for mention of other risks the respondent perceived as important and not adequately described by the listed classes of risk. Question 10 solicited a rating for each of several factors to determine why the risks were rated as they were on Question 9 -- that is, to show how important these factors were in determining the relative importance of the risks. Opportunity was provided to write in other influential factors. Question 11 asked for a rating of the bank's overall health through the rating scheme commonly known in the banking industry as the CAMEL rating; this question was included to establish an objective reference point for evaluating the health and risk exposure of the banks. Question 12 was a follow-up question that determined which risks had the greatest effects in changing the bank's overall health. Question 13 was another follow-up ques-

tion which showed how the individual CAMEL factors changed over time and provided another indication of the importance of and the exposure to the various risks. Together, all of these questions determined the bankers' perceptions of risk faced by their operations over the last five years.

"Measures of Risk," the third area of inquiry, had only two questions. Question 14 asked for a ranking of the measures used in monitoring each type of risk for three separate time periods (five years ago, three years ago, and today). Several measures were listed for each of the six risks, and write-in options were provided. The respondent was asked to create a hierarchy among these measures to show which ones were more (or less) important in monitoring the bank's risk exposure. Question 15 asked for a ranking of the risks according to the difficulty with which they are monitored. Thus, these questions determined how the bankers measured risk, which measures were more important, how their importance had changed over time, and which risks were most difficult to monitor.

The fourth section, "Risk Responses," had eight questions and was the longest section of the questionnaire. The first question asked bankers to rate the use of various risk management procedures and how the use of each practice had changed over time. Practices associated with credit risk which were rated included diversification of the various portfolios, loan insurance, loan guarantee programs, and review of loan policies. Investment risk management practices evaluated included gap management and investment portfolio management. Liquidity risk management techniques rated included investment portfolio

management, participation loans, loan sales, and solicitation of deposits via incentive/premium programs. Management techniques rated for cost of funds risk included variable rate loans, financial futures, gap management, and deposit pricing policies. Solvency risk management techniques considered included, indirectly, almost all of the other practices already mentioned, and directly, the limiting of dividends and the increasing of the number of income centers within the hank.

The second part of the "Risk Responses" section examined a numher of risk management practices in greater detail. Question 17 was directed at the use of diversification to deal with credit risk in the loan portfolio and to deal with deposit liquidity risk. Questions 18, 19, and 20 were concerned with overline loan requests and participation loans. Question 21 inquired ahout the importance of the various harriers to the use of financial futures since adoption of this technique has heen slow. Question 22 examined gap management hy looking at the sign of the hank's gap; this is also a gauge of hankers' interest rate expectations (the model implied in the question was the basic gap model). Question 23 considered how the hank's spread had changed over time.

The final area of inquiry, "The Agricultural Lending Function and Risk Responses," dealt with the nature of the agricultural lending program and the risks related to it. Unlike the three previous sections, it consisted only of check or fill-in questions. Questions 24 through 27 descrihed the nature of the agricultural lending program. Questions 24, 25, and 26 deter-

mined both its absolute and relative size and importance. Question 27 inquired about the bank's ability to handle today's larger agricultural loans.

Questions 28 through 35 dealt with credit risk and other risk considerations in the agricultural loan portfolio. Question 28 was used to examine how demand for financial information from agricultural borrowers has changed over time. Questions 29 and 30 considered how banks protect their interests via collateral requirements. Questions 31 and 32 both dealt with credit risk in that they both considered terms of repayment; they dealt with cost of funds risk also in that they were concerned with asset maturity. Question 33 examined how the quality of farm loan portfolios has changed over time as a gauge of credit risk exposure. Question 34 examined the use of another credit risk management tool, guaranteed loans. Question 35 dealt with both the quality of the bank's agricultural loans and its willingness and ability to use them as a source of liquidity.

Implementing the survey. One step taken to improve the quality of the questionnaire was a pre-test process. A preliminary draft of the questionnaire was sent to several bankers and the executive staff of the Kansas Bankers Association (KBA) to solicit their suggestions on length, subject matter, clarity and wording of the questions, and other pertinent considerations. Several suggestions were incorporated into the final draft of the questionnaire.

Other steps were taken to encourage a greater response to the survey. First, a letter of endorsement from the KBA was included with the departmental letter in the preface to the

questionnaire as an indication of industry support and approval of the survey. The KBA also encouraged response through a notice in the September 1985 issue of their monthly publication, The Kansas Banker, and through announcements at bank management training seminars held throughout the state during the month of September. To ensure that the questionnaire would reach the chief executive officers, the questionnaires were sent directly to the chief executive officers (rather than simply to the banks) from a mailing list provided by the KBA. Also, business reply envelopes were supplied for greater convenience to the respondent. Finally, a follow-up letter was mailed in early October as a reminder to complete and return the form.

STATISTICAL ANALYSES USED

A variety of different situations were examined, requiring a number of different statistical tests. The nature of the data for each particular situation determined the type of test used. Some questions such as the ranking questions produced data which did not satisfy the requirements for using parametric tests, so only nonparametric tests were possible in these cases.

The nonparametric Friedman test was used to examine rankings of factors within one time period to determine if at least one factor tended to be ranked differently from at least one other factor. If some rankings tended to be different, then the sum of the ranks for the different factors would tend to be different, and the test statistic, which uses a chi-square distribution, would become significantly large.[1] This test was used in compar-

ing the rankings of risks and risk measurement tools.

The Friedman test would also have been the appropriate test to compare the rankings given to just two different factors within one time period. These comparisons were not made, however, because although

> "further comparisons between treatments [could] be made by repeatedly applying the Friedman test to the reduced number of treatments, . . . very little meaning may be attached to [the significance level] in the subsequent tests."[2]

Three different statistical tests were used to compare rankings and ratings given by different groups of banks (e.g., agricultural versus nonagricultural). The first test involved an analysis of variance procedure to detect significant differences among the means of the different groups. If the F-test showed significance, the least significant difference (LSD) t-test was used to determine whether significant differences existed among the means of particular groups at the .10 level of significance. This process produced "protected" LSD comparisons, an important precaution since many comparisons were made and the unprotected LSD procedure is likely to incorrectly indicate significance on at least some tests when many comparisons are performed.[3] To detect significant differences which existed even when the F-test indicated otherwise, Bonferroni's test was used. This test controls the "experimentwise error," which is "the probability of making at least one error in an experiment when there are no differences among treatments."[4]

Another procedure was used to detect changes in ratings given by all banks. The statistical test used here was the paired-t test, which is appropriate when two population means are

compared and the observations in eacb population are dependent on each otber. An example from tbis study would be ratings given a psrticular risk response over time. Witb the passage of time, risk response may be different from that of tbe previous period; tbe same bankers were rating the response so the populations were dependent or related.

A final analytical procedure was used to determine bow requirements for financial ststements changed over time. This statistical analysis was the chi-square test for goodnes of fit. Tbis test compared tbe actual and average number of observations for each time period; statistical significance appeared when these figures differed.

To summarize, parametric and nonparametric tests were used, as tbe situations dictated. In some instances, a number of tests were used to ensure detection of differences which truly existed and to avoid claiming differences which did not exist. Discernment was necessary in the interpretation of the results of these statistical tests, whicb were rather blunt instruments in some cases where the data were rather messy. The tests selected, however, were the best measurement instruments available. Tbe results of the various tests are noted in the next chapter.

SUMMARY

The goal of this study of banking risk was to examine bankers' perceptions of risk and the risk management practices they use. Tbe empirical study was designed to meet these objectives tbrough tbe use of ranking and rating schemes and otber types of

questions. The formulation of the questionnaire required the clear, precise, and pertinent questions be developed to examine the topics adequately and encourage complete response. A survey of all Kansas banks was deemed to be the most appropriate method of data collection. Several statistical analyses -- both parametric and nonparametric -- were used to analyze the data and evaluate the results.

FOOTNOTES

[1]W. J. Conover, Practical Nonparametric Statistics (New York: John Wiley and Sons, 1971), p. 265.

[2]Ibid., p. 269.

[3]George A. Milliken and Dallas E. Johnson, Analysis of Messy Data (Belmont, California: Lifetime Learning Publications, 1984), p. 33.

[4]Ibid., p. 31.

CHAPTER FIVE

RESULTS OF THE EMPIRICAL STUDY

INTRODUCTION

This chapter presents the results of the survey of Kansas bankers on risk perceptions, risk measurement, and risk management. Response to the survey and results of the survey for all banks are reviewed first. These results are followed by the results of comparisons of banks differing in size, geographic location, management experience, and current CAMEL rating. Significant trends in bank performance and operations, and significant differences among groups of banks are discussed.

NATURE OF SURVEY RESPONSE

The final response rate to the survey was 15 percent. Ninety-two usable responses were received from the 615 questionnaires mailed on August 27, 1985. Approximately one-third of the responses received were returned within the first ten days; a small steady flow continued throughout the month of September. A follow-up letter was mailed on October 4, 1985, extending the response deadline to October 15; approximately a dozen more responses were received during the extended response period.

One major reason for the low response is believed to be the length of the questionnaire. While pre-tests indicated that it

was not extremely time-consuming to complete, it still had the appearance of being a long, difficult form. A few bankers also commented that the questionnaire was difficult to complete. There was missing data on almost every question since not every banker completed every question. The level of response to each question will be noted when it appears to be sufficiently low. Response was more than adequate for statistical analyses on nearly all questions.

RESPONSE FROM ALL BANKS

Bank characteristics. Total assets for the 92 banks averaged 40.6 million dollars but ranged from 3.7 million dollars to 425 million dollars; the median response was 26.2 million dollars (Table 1). The mean capital/assets ratio was 9.4 percent, while the median response was 8.85 percent. The mean and median for the loan/deposit ratio were, respectively, 52.8 percent and 55.3 percent. The mean return on assets was 1.160 percent, and the median return on assets was 1.165 percent; 8 of the 78 total responses were negative. Concerning the charter of the banks, 31 were national banks, 10 were state banks and members of the Federal Reserve, and 49 were state-chartered but not members of the Federal Reserve. Sixty-nine banks were owned by a holding company, while 23 were not. Sixty of these holding companies owned only 1 bank, while 1 company held 7 and another held 8. Twenty-six banks were part of a "chain" banking system with each chain controlling an average of 5.2 banks. The 57 Kansas counties represented were dispersed across the state. The respondents' number of years as a chief executive officer averaged 9.35

years. However, the median was only 7 years, with 30 bankers baving 3 years experience or less.

TABLE 1
BANK CHARACTERISTICS: AVERAGES FOR ALL RESPONDENTS

Total assets:	$ 40,610,436
Capital/asset ratio:	9.40%
Loan/deposit ratio:	52.81%
Rate of return on assets over the twelve month period from July 1, 1984 to June 30, 1985:	1.16%
Bank Cbarters:	
National banks	31
Stste banks and Federal Reserve System members	10
State banks and Federal Reserve System nonmembers	49
Banks owned by a bank holding company:	69
Average number of banks controlled by these holding companies:	1.26
Banks not owned by a bank holding company:	23
Banks controlled by groups (families, individuals, etc.) wbicb bave controlling interest in more tban one bank:	26
Average number of banks controlled by these groups:	5.21
Banks not controlled by such groups:	62
Average number of years as a chief executive officer:	9.35

Risk identification. The bankers ranked the six banking risks according to the risks' impact on the bankers' decision-making. Each risk's relative importance was considered over four periods: five years ago, tbree years ago, today, and two to tbree years in the future (Table 2). For all four periods, credit risk was ranked as tbe most important risk, and cost of funds risk was ranked second. The average ranking of credit risk increased over time from 2.41 five years ago to 1.58 today. Cost of funds risk received its highest average ranking three

years ago, a time of very volatile interest rate behavior. Regulatory risk may be perceived as more important today by some bankers because of increasing competition or by what some bankers perceive as changing or inconsistent bank examiner attitudes. Investment risk declined in importance over time. Solvency risk was consistently ranked last. For all periods, the Friedman tests showed that the risks tended to be ranked differently even at the .001 significance level.

TABLE 2
RANKING OF BANKING RISKS FOR SELECTED TIME PERIODS

	FUTURE	TODAY	3 YRS	5 YRS
BANKING RISK		Average rankings[a]		
Credit risk:	1.59	1.58	2.05	2.41
Investment risk:	4.20	4.17	3.61	3.48
Liquidity risk:	3.68	3.86	3.53	3.33
Cost of funds risk:	3.08	3.12	2.65	2.80
Solvency risk:	4.59	4.67	4.87	4.72
Regulatory risk:	3.75	3.68	4.36	4.39

[a]Rankings went from 1 for the most important to 6 for the least important.

For the factors determining the ranking of risks today, the state of the farm economy was rated highest (Table 3). The state of the general economy and the quality of officers and staff were also regarded as quite important factors in determining relative rankings. Volatile interest rates, competitors' activities, deregulation of interest rates, and changing bank structure were all regarded as somewhat less important, although none were rated as unimportant. For three years ago, volatility of interest rates was rated highest, consistent with the highest average ranking of

TABLE 3
FACTORS INFLUENCING RISK RANKING DECISIONS,
SELECTED TIME PERIODS

FACTORS	TODAY	3 YRS AGO	5 YRS AGO
	Average ratings[a]		
State of farm economy	1.13[b]	1.74[b]	2.15
State of general economy	1.45[b]	1.86[h]	2.06
Volatility of interest rates	1.80[b]	1.31[b]	1.90
Activity of competitors	2.11	2.18[b]	2.33
Deregulation of interest on deposits (phase-out of Reg Q)	1.95	1.79[b]	2.21
Quality of officers and staff	1.40[b]	1.70[h]	1.88
Cbanging banking structure laws	2.08[b]	1.33[b]	2.53

[a]Rating scale: 1) utmost importance; a critical factor
2) important, thougb not a critical factor
3) some minor relevance; not very important

[b]This rating is statistically different from that of the previous period at tbe .05 level of significance.

cost of funds risk. Three years ago the farm economy, the general economy, deregulation of interest rates, and officer quality were clustered together as somewhat important, while competition and banking structure laws were rated as being of less importance. Tbe ratings for five years ago were lower for every factor, and the groupings became less clear. The state of the farm economy was significantly bigher in each period. Several banks mentioned in tbe "other" category tbat changing and inconsistent bank examination standards were important considerations in the evaluation of tbe rankings of the risks.

The average CAMEL rating, the rating of a hank's overall health, went from 1.57 five years ago to 1.69 three years ago, and to 1.96 today (Table 4). The decline from five to three years ago was not significant at the .05 level, but the decline from three years ago to today was statistically significant. Of

TABLE 4
BANKING PERFORMANCE: RATINGS FOR OVERALL CAMEL AND CAMEL COMPONENTS

FACTOR RATED	TODAY	3 YRS AGO	5 YRS AGO
	Average ratings[a]		
Overall CAMEL rating:	1.96[b]	1.69	1.57
Capital adequacy	1.51	1.47	1.55
Asset quality	2.14[b]	1.89[b]	1.75
Management ability	1.49	1.60	1.60
Earnings record	2.04	1.82	1.85
Liquidity position	1.38[b]	1.56	1.61

[a]Rating scale: 1 for excellent performance to 5 for poorest performance.
[b]This rating is statistically different from that of the previous period at the .05 level of significance.

tbe five CAMEL components, capital adequacy was basically static, while asset quality dropped significantly in each period, falling from an average of 1.75 five years ago to 2.14 today. Loan portfolios bave deteriorated in quality for many banks during this time. Ratings of management ability stayed basically the same over time. Tbe drop in average earnings since three years was not statistically significant. In the aggregate, banks' liquidity improved over time.

Risks responsible for changes in bank performance were ranked similarly to the rankings of the risks' perceived importance for the future and today (Table 5). Credit risk was clearly the most important, cost of funds risk second, liquidity risk and regulatory risk were closely matched, and investment risk and solvency risk were the least important.

Responses to questions on risk identification and bank performance indicate that banking has become riskier, mainly due to

TABLE 5
RANKING OF RISKS AFFECTING BANK PERFORMANCE

Risks responsible for changes in performance:

	Average rankings[a]
Credit risk	1.39
Investment risk	4.12
Liquidity risk	3.87
Cost of funds risk	3.14
Solvency risk	4.20
Regulatory risk	3.95

[a]Rankings went from 1 for the most important to 6 for the least important.

the effects of credit risk. The falling CAMEL ratings indicate a general deterioration in the overall health of many Kansas banks. Many bankers consider the farm recession a major factor influencing bank risk exposure today.

Measuring risk. Several measures were ranked according to their importance in measuring each of the six risks. For all but two sets of rankings, the Friedman test indicated that at least one factor tended to be ranked differently from at least one other factor at a significance level of .05, and most of the rankings showed significant differences at the .001 level. The order of rankings of the measures changed in several risk areas, showing that risk measurement has changed.

Five measures were ranked according to their importance in monitoring credit risk over the last five years (Table 6). The dollar volume of loan losses was ranked first in every period and grew in relative importance over time. Ninety-day loan delinquencies consistently ranked second, hut its average ranking remained hasically unchanged. Loan losses as a percent of all

TABLE 6
RANKINGS FOR MEASURES OF THE SIX BANKING RISKS

MEASURES OF RISK	TODAY	3 YRS AGO	5 YRS AGO
	Average rankings		
Credit risk[a,e]:			
Loan losses: dollar volume	2.15	2.17	2.43
Loan losses: % of loans	3.21	3.09	3.17
Loan delinquencies: 30 days	3.66	3.55	3.30
Loan delinquencies: 90 days	2.73	2.73	2.63
Forecasts of business conditions for your borrowers	3.35	3.62	3.53
Investment risk[b,e]:			
Volatility of interest rates	2.41	2.29	2.83
Ratings on securities held	3.70	3.70	3.69
Maturities of securities held	2.65	2.80	2.73
Marketability of securities held	3.49	3.32	3.27
Cash demand (e.g., loan and withdrawal demand)	3.84	3.80	3.80
Pledging requirements	4.53	4.80	4.75
Liquidity risk[c,e]:			
Short term assets/s.t. liabilities	2.94	3.45	3.96
Loan/deposit ratio	3.33	2.97	2.90
Time deposits/total deposits	4.18	3.86	3.94
New loan demand	4.33	3.86	3.94
Loan renewals	4.64	4.95	4.65
Volatile deposits	3.46	3.78	4.19
Withdrawal demand	4.80	4.83	4.81
Cost of funds risk[c,e]:			
Gaps (RSA - RSL = GAP)	2.78	3.54	4.49
Spreads	1.94	2.22	2.72
Rates paid by competition	3.80	3.32	2.88
Ratio of time and savings deposits to total deposits	5.12	4.59	4.45
Maturities of time deposits	4.51	4.62	4.33
Projected interest rate changes	4.65	4.58	4.26
Cost of operations	5.04	4.97	4.79
Solvency risk[d,e]:			
Loan losses	1.76	2.01	2.17
Loan delinquencies	2.75	2.58	2.66
Capital/asset ratio	2.70	2.53	2.39
General economic conditions	2.89	2.91	2.83
Regulatory risk[d,f]:			
Regulators' publications & contacts	1.92	2.17	2.26
Industry publications & contacts	2.83	2.79	2.72
Pending federal legislation	2.19	2.01	2.17
Pending state legislation	2.82	2.82	2.90

(continued on the next page)

TABLE 6 -- Continued

[a]Rankings went from 1 for the most important to 5 for the least important.
[b]Rankings went from 1 for the most important to 6 for the least important.
[c]Rankings went from 1 for the most important to 7 for the least important.
[d]Rankings went from 1 for the most important to 4 for the least important.
[e]Rankings for all periods showed statistically significant differences for all periods at the .05 significance level.
[f]The rankings for TODAY and 3 YEARS AGO were not statistically significant at the .05 level of significance.

loans consistently ranked third. Forecasts of borrowers' business conditions and thirty-day loan delinquencies alternated in the fourth and fifth ranks. Concerning loan losses, the dollar volume of losses was preferred to losses as a portion of loans. Concerning delinquencies, ninety days was the preferred length of time as a measure of credit risk.

Several write-in responses were recorded on credit risk measurement. Most involved either a ratio including classified loans or the absolute amount of classified loans; this type of measure would be somewhat different than either loan losses or loan delinquencies, although the concepts are similar. No major shifts in credit risk measurement over time are apparent from this data.

Changes in investment risk measurement over time do not appear to be substantial (Table 6). One change concerned the volatility of interest rates; its average ranking was highest three years ago at the time of greatest interest rate fluctuation. The mean ranking of maturities stayed relatively constant over time. Marketability of securities was consistently ranked

third. Ratings on securities was consistently ranked fourth but was closely followed by cash demand. Pledging requirements easily ranked last.

Three groupings appeared among investment risk measures, and the groupings are consistent with what theory would suggest. Interest rate volatility and bond maturities are most important, cash demand and securities' ratings and marketability are somewhat less important, and pledging requirements are relatively unimportant.

Changes were also found in liquidity risk measurement. However, the differences in the rankings showed less significance than those for any other group of risk measures. The most notable changes were the rise in importance of the short term assets/short term liabilities ratio and the marginal decline in the importance of the loan/deposit ratio. Volatile deposits, the time deposits/total deposits ratio, and new loan demand alternated in the middle ranks. Volatile deposits became more important, while new loan demand became less important. Loan renewals and withdrawal demand were consistently the least important measures of liquidity risk. Two notable write-in responses were "Fed Funds line of credit" and "Federal Reserve line of credit."

Material changes occurred in the measurement of cost of funds risk (Table 6). Spreads were consistently ranked as the most important measure, and the average ranking became higher over time. The greatest change was seen in the importance of gaps as a measure of risk; gaps moved from the sixth rank to the second rank over the five-year period. The decline in the

average ranking of rates paid by competition may be more a function of the consistently higher rankings of gaps and spreads rather than a significant decline in the competition for funds. The other four measures alternated among the remaining positions; none are becoming more important as measures of cost of funds risk. Net interest margin, the measure quite similar to spread, was mentioned once as a write-in response.

Solvency risk measurement saw no major changes over the five year period. The most important measure in all three periods was loan losses. The capital/asset ratio always ranked second, but its average ranking declined over time to where it is not materially different from loan delinquencies. The influence of general economic conditions consistently ranked last.

Regulatory risk measures appeared to separate into two groups (Table 6). The most important group consisted of regulatory puhlications and contacts, and pending federal legislation. Thus, federal legislation was considered more important than state legislation, and regulatory contacts were considered more important than industry contacts.

The six risks were also ranked according to the difficulty with which they were measured (Table 7). The results were similar to the rankings of the importance of the risks, but there were some notable differences. Credit risk was again ranked first, hut not by as wide a margin. Regulatory risk ranked second, consistent with its rise in importance over time. Cost of funds risk ranked third, investment risk ranked fourth, and liquidity risk was ranked only fifth. Solvency risk was

TABLE 7
DIFFICULTY OF MEASURING RISKS

Difficulty with which risks are measured:

	Average rankings[a]
Credit risk	2.34
Investment risk	3.82
Liquidity risk	4.06
Cost of funds risk	3.16
Solvency risk	4.38
Regulatory risk	2.63

[a]Rankings went from 1 for the most important to 6 for the least important.

considered the least difficult risk to measure.

Some shifts have occurred in risk measurement over time, as conditions have changed and as measurement tools have been refined. Credit risk seems to be the most important yet most difficult risk to measure. Measurement of cost of funds risk has changed over time, as gaps and spreads have grown in importance. Results also indicate that bankers seem to prefer more direct measures within the bank to the less direct measures of external factors (e.g., loan losses and loan delinquencies versus business forecasts for credit risk, gaps and spreads versus projected interest rate changes for cost of funds risk, and loan losses versus general economic conditions for solvency risk). The latter type of measure would seem to have some value for risk measurement, but in every case the former type of measure was clearly preferred.

Risk management. The longest section of the questionnaire was concerned with risk responses. Eight questions were used to collect information on the use of and rationale behind various

risk management practices.

Risk managment practices concerned mainly witb credit risk management were diversification of the loan portfolio, loan pricing, loan insurance, loan guarantees, review of loan policies, and improving customers' creditwortbiness via seminars. Tbe ratings of every factor climbed through every period; only differences for geographic diversification of tbe loan portfolio were not statistically different (Table 8). Diversification among types of loans in tbe loan portfolio was basically limited in practice. Cbarging higher interest rates on riskier loans increased significantly in use over time, as did tbe use of loan insurance and guarantees. Tbe bigbest rating among credit risk responses went to tbe annual review of lending policies. This

TABLE 8
RATINGS OF CREDIT RISK MANAGEMENT RESPONSES

RISK RESPONSES	TODAY	3 YRS AGO	5 YRS AGO
	Average ratings[a]		
Managing the percentages of tbe loan portfolio in eacb type of loan	2.13[b]	2.37[b]	2.49
Diversifying the loan portfolio geograpbically	2.67	2.68	2.73
Cbarging higher interest rates on riskier loans	1.54[b]	1.85[b]	2.01
Use of loan insurance (e.g., crop, hail, and credit life insurance)	1.59[b]	1.94[b]	2.13
Use of guarantee programs (e.g., SBA and FmHA programs)	1.87[b]	2.15	2.23
Annual review of lending policies	1.34[b]	1.65[b]	1.89
Giving seminars to improve customers' creditworthiness	2.54[b]	2.68	2.70

[a]Rating scale: 1) extensive use
2) limited use
3) not used

[b]This rating is statistically different from that of the previous period at the .05 level of significance.

practice went from moderate use five years ago to extensive use today. Overall, it appears that several practices are being used more extensively today.

Several cost of funds risk management practices also reflected a trend for all practices to receive more extensive use today (Table 9). The use of variable rate loans changed from very limited use five years ago to much more extensive use today. Gap management experienced an even greater jump and has relatively extensive use today. Hedging with financial futures contracts was almost nonexistent in all three time periods. Making weekly changes in rates offered on certificates of deposit in response to changes in national money market rates increased

TABLE 9
RATINGS OF COST OF FUNDS RISK MANAGEMENT RESPONSES

RISK RESPONSES	TODAY	3 YRS AGO	5 YRS AGO
	Average ratings[a]		
Using variable rate loans with fixed maturities & variable payment size	1.88[b]	2.30[h]	2.64
Using variable rate loans with fixed payment size & variable maturities	2.15[b]	2.45[b]	2.65
Gap management	1.57[b]	2.09[b]	2.60
Hedging cost of funds risk with financial futures	2.92	2.98	2.97
Changing CD interest rates weekly in response to changes in national money market rates	1.24[b]	1.61[b]	2.13
Adjusting service fees to match the costs of these services	1.64[b]	1.94[b]	2.35
Basing interest rate changes on rates charged or paid hy competitors	2.12	2.08	2.09

[a]Rating scale: 1) extensive use
2) limited use
3) not used

[h]This rating was statistically different from that of the previous period at the .05 level of significance.

dramatically in use and received the highest rating given any practice. However, basing interest rate changes strictly on what competitors offer remained only limited through all time periods. Adjusting service fees to more accurately reflect the cost of those services was also rated much higher today than five years ago. These results indicate adoption of new practices in the treatment of cost of funds risk.

Participation loans with correspondents, a practice used to deal with liquidity risk (and other risks, as well) declined marginally in importance and remained limited in use (Table 10). Selling loans to other banks controlled by the same owners was very limited in use, probably because a majority of the banks were the only banks held by their owners. The use of incentive or premium programs to attract deposits was another liquidity

TABLE 10
RATINGS OF MANAGEMENT RESPONSES TO LIQUIDITY RISK, INVESTMENT RISK, AND SOLVENCY RISK

RISK RESPONSES	TODAY	3 YRS AGO	5 YRS AGO
	Average ratings[a]		
Participation loans with correspondents	2.26[b]	2.10	2.05
Sales of loans to other banks controlled by your bank's owners	2.61	2.73	2.80
Specifying percentages of investment portfolio to be held in certain types of securities	1.78[b]	1.89[b]	2.07
Use of incentive/premium programs to maintain and attract deposits	2.81	2.72	2.71
Limiting dividends to build capital	1.79[b]	1.93	2.01

[a]Rating scale: 1) extensive use
2) limited use
3) not used

[b]This rating is significantly different from that of the previous period at the .05 level of significance.

risk management tool which was very limited in use over all three time periods. Specifying the percentages of the investment portfolio to be held in certain types of securities became more important as an investment risk management tool although its use is still moderate. Solvency risk management via limiting dividends also became somewhat more important, although its use does not appear to be extensive among most banks at this time.

Several general risk management practices were also rated (Table 11). One such practice was an annual review of staffing needs. This practice went from moderate use five years ago to fairly extensive today. Increasing liability insurance on officers and board members has become more extensive, going from somewhat limited use five years ago to moderate use today.

TABLE 11
RATINGS OF VARIOUS OTHER RISK MANAGEMENT RESPONSES

RISK RESPONSES	TODAY	3 YRS AGO	5 YRS AGO
	Average ratings[a]		
Annual review of staffing needs	1.58[b]	1.70[b]	1.95
Annual review of bank's goals and objectives	1.53[b]	1.78[b]	2.05
Participation in C.E.O. and officer training seminars and schools	1.46	1.53[b]	1.67
Increasing liability insurance on officers and Board of Directors	1.76[b]	1.94[b]	2.19
Providing financial planning services for customers	2.20[b]	2.46	2.53
Increasing the number of income centers in the bank (adding insurance, discount brokerage services, etc.)	2.20[b]	2.42	2.52

[a]Rating scale: 1) extensive use
2) limited use
3) not used

[b]This rating is statistically different from that of the previous period at the .05 level of significance.

Providing financial planning services for customers and increasing the number of income centers in the bank by adding such services as insurance and discount brokerage services are both still limited in use today.

Relevant issues for banks that find their local economies depressed concern the bank's diversification policy. The first issue was diversification of the loan portfolio over a broader trade area. In the aggregate, 43 banks were able to accomplish loan diversification, while 49 banks were not (Table 12). In comparing agricultural and nonagricultural banks, 60 percent (15 banks) of the nonagricultural respondents said they could reach broader markets in lending, while only 42 percent (28 banks) of agricultural banks could accomplish this. Relative to diversifying deposits, the results were exactly the same in the the aggregate and almost exactly the same when the agricultural-nonagricultural distinction was made. The final issue concerning diversification dealt with the effects of the new multibank holding company laws. Only 16 banks said they would change their

TABLE 12
RESPONSES TO DIVERSIFICATION ISSUES

TYPE OF BANK:		ALL	AG	NON-AG
ISSUES		Number of banks		
Diversification of loan portfolio:	YES	43	28	15
	NO	49	39	10
Diversification of deposits:	YES	43	29	14
	NO	49	38	11
Diversification with multi-bank holding companies:	YES	16	9	7
	NO	75	57	18

emphasis on geographic diversification as a result of the legalization of multibank holding companies, while 75 banks said that their emphasis would not change. Twenty-eight percent of the nonagricultural banks said that their emphasis would change, while only 14 percent of agricultural banks said that they would adopt new policies here.

Information gathered on the use of participation loans appears to be inconsistent. The survey questions were intended to gauge the importance of overline lending in making participation loans. An average of 38.6 percent of the number of participation loans were overline loans, while 39.6 percent of the dollar volume of participation loans were overlines. The difference between these percentages was expected to be relatively greater because overline participation loans by nature are larger than non-overline participation loans. Since 42 banks indicated that they had no participation loans which were not overlines, the participation route seems an important response to overline requests.

Table 13 shows rankings on all responses to overline requests and how these have changed over time. The most popular response was participation with a regular correspondent, although its average ranking declined slightly over time. Referral to another institution in the area was consistently ranked second for all three time periods. Participation with another bank closely held by the bank's owners saw the greatest jump in ranking over time, moving from the fifth and lowest rank five years ago to the third ranking today. As the future ownership in the banking industry becomes more concentrated, this could continue

TABLE 13
RANKINGS OF RESPONSES TO OVERLINE REQUESTS AND REASONS FOR NON-OVERLINE PARTICIPATION LOANS

RESPONSES	TODAY	3 YRS AGO	5 YRS AGO
	Average rankings[a]		
Responses to overline requests:			
Participation witb a regular correspondent	1.87	1.60	1.40
Refer to another institution in area	2.85	2.96	2.93
Refer to another bank closely held by tbe owner of your bank	3.49	3.60	3.70
Participation with another bank controlled by tbe owner of your bank	3.12	3.49	3.74
Denial of all overline requests	3.58	3.59	3.36
Reasons for non-overline participation loans[b]:			
To spread out or share credit risk with another institution:		2.08	
For income purposes in a holding company or "chain" banking setting:		2.54	
To improve or maintain tbe bank's liquidity situation:		1.50	

[a]Rankings went from 1 for tbe most important to 5 for the least important.
[b]Rankings went from 1 for tbe most important to 3 for the least important. Only 26 banks ranked these responses; 42 banks indicated that tbey bad no participation loans whicb were not overlines.

to grow in popularity. Referral to anotber bank closely beld by the bank's owners and denial of all overline requests usually occupied the lowest two ranks. It appears that participation in overline situations is generally preferred to referring these customers to other institutions.

Rationale for non-overline participation loans were also ranked (Table 13). Of tbe three responses, improving or maintaining the bank's liquidity position was clearly ranked as most important. Spreading out credit risk was ranked second, and income purposes in a holding company or chain banking setting

was ranked as the least important. Two write-in responses which each appeared twice were generation of additional profits, and "town project" types of loans.

Large barriers to the use of financial futures contracts in cost of funds risk management must exist for Kansas bankers. Lack of qualified personnel was the highest-ranking response, followed by riskiness of financial futures trading and then presence of better risk management alternatives (Table 14). The fourth, fifth, and sixth ranks were occupied by resistance by the board of directors, adverse accounting treatment, and resistance by regulators. The complexity and perceived riskines of financial futures trading appear to be greater barriers than hesitation on the part of regulators and directors.

TABLE 14
RANKING OF BARRIERS TO USE OF FINANCIAL FUTURES CONTRACTS IN MANAGING COST OF FUNDS RISK

RESPONSES	Average ranking[a]
Adverse accounting treatment of futures positions:	4.23
Lack of qualified personnel to implement and manage a hedging program:	2.22
Riskiness of financial futures trading:	2.67
Presence of reasonably effective, more practical, and less costly risk management alternatives:	3.21
Resistance by regulators:	4.23
Resistance by Board of Directors:	3.96

[a]Rankings went from 1 for the most important to 6 for the least important.

Eighty-six banks responded to the question related to the use of a basic gap model in cost of funds risk management (Table 15). Twenty banks indicated that they did not calculate gaps for

any of tbe three time borizons. Of tbe 66 banks which calculated gaps, about two-tbirds maintained positive gaps wbile tbe remaining one-tbird maintained negative gaps. This may indicate that most Kansas bankers expect interest rates to rise or at least want to be protected if tbey do.

TABLE 15
MANAGEMENT OF GAPS AND SPREADS

GAP MANAGEMENT: Number of banks having gaps wbich are:	Positive	Negative	Not calculated
For a three month horizon:	40	26	20
For a six montb borizon:	46	20	20
For a twelve month horizon:	47	19	20

SPREAD MANAGEMENT[a]:	
Average spread today (74 banks):	4.07%
Average spread 3 years ago (56 banks):	4.51%
Average spread 5 years ago (44 banks):	4.45%

[a]Eight banks indicated they do not calculate a spread today.

Differences in average spreads were not statistically significant (Table 15). Tbe aversge spread for tbe 74 banks responding for today was 4.07 percent, wbile the average spread for 54 banks three years ago was 4.51 percent. Tbe average spread for tbe 44 banks responding for 5 years ago was 4.45 percent. Eight banks indicated tbat tbey do not calculate a spread today.

Risk management is becoming more extensive and intensive as tbe banking environment changes. Only three of the twenty-five practices rated became less extensive in use, and only tbree otbers did not become more extensively used in terms of statistical significance. Cost of funds risk management has progressed,

in particular, as circumstances have required and as new risk management techniques bave permitted. It also appears that certain general or overall risk management techniques are more commonly practiced today.

Agricultural lending and risk responses. Responding to risk in tbe agricultural lending process is quite important for Kansas banks, given tbat most of them are predominantly agricultural lenders and that the farm economy is depressed in 1985. Results from tbe final section of questions describe the current state of certain agricultural lending practices and how tbese have changed over time.

For the 86 banks responding, agricultural loans averaged 45 percent of tbe dollar volume of the entire loan portfolio. The median response was 47 percent, and 67 banks met the Federal Reserve's definition of an agricultural bank (i.e., tbey have at least 25 percent of their loan portfolios in agricultural loans). The average size of tbe agricultural loan portfolio was 5.6 million dollars, the median response was 4.0 million dollars, and the largest response was 20 million dollars. The average number of agricultural lending officers was 2.1 and tbe median was 2. Nine banks reported having 4 or more agricultural lending officers, and 1 bank reported that it had 6 officers in this area. An average of 3.6 percent of all agricultural loan applications exceed banks' legal lending limits today. Thirty-one banks indicated that no applications exceeded their lending limits today; results were similar tbree and five years ago. The data seem to indicate that there are many fairly small, agriculturally-oriented banks that are generally able to service their agricultural

customers.

One response to current agricultural lending conditions centers on the demand for information from farm borrowers. Tbe balance sbeet was required by all 83 respondents today, witb no significant increase seen in this requirement over time (Table 16). However, statistically significant incresses in requirements were seen for income statements, casb flow statements, and Scbedule F (tbe statement of income and expense on farmers' income tax returns). Almost every bank now requires a cash flow statement and a statement of income and expenses in sddition to the balance sheet. Tbis beld true for both agricultural and nonagricultural banks. Write-in responses included collateral and inventory inspection sbeets and depreciation scbedules. Tbus, more financial information is being demanded from agricultural borrowers today than in the past.

TABLE 16
FINANCIAL STATEMENTS REQUIRED FROM AGRICULTURAL BORROWERS

FINANCIAL STATEMENT		TODAY	3 YRS AGO	5 YRS AGO
		Number of banks		
Balance sheet:	All banks	83	76	73
	Ag banks	64	58	55
	Non-ag banks	19	18	18
Income statement:	All banks	64	29	14
	Ag banks	48	19	9
	Non-ag banks	16	10	5
Casb flow statement:	All banks	78	24	11
	Ag banks	61	19	5
	Non-ag banks	11	8	3
Schedule F:	All banks	60	11	6
	Ag banks	48	7	5
	Non-ag banks	12	4	1

Security requirements -- that is, the portion of the appraised value of an asset which the bank provides with the loan -- changed over the last five years for eight types of agricultural loans (Table 17). For every type of loan, collateral requirements are significantly more conservative today than three years ago, while differences between requirements three years ago and five years ago were not significantly different for any type except farm real estate loans. Banks thus appear to have become more conservative in their lending as they attempt to safeguard themselves against agricultural credit risk.

TABLE 17
CHANGING SECURITY REQUIREMENTS ON AGRICULTURAL LOANS

TYPE OF LOAN	TODAY	3 YRS AGO	5 YRS AGO
	Percent of asset value loaned		
Farm real estate loans	62.2 %[a]	70.4 %[a]	73.1 %
Farm machinery loans (new)	63.8 %[a]	71.8 %	73.6 %
Farm machinery loans (used	57.3 %[a]	67.7 %	68.8 %
Crop operating loans	68.6 %[a]	75.0 %	76.8 %
Cow-calf operation loans	72.0 %[a]	76.0 %	76.3 %
Cattle and hog feeding loans (animals and feed	70.2 %[a]	75.7 %	76.7 %
Cattle and hog feeding loans (animals only)	77.1 %[a]	80.7 %	81.8 %
Hog farrowing operation loans	65.6 %[a]	74.2 %	72.5 %

[a]This requirement is significantly different from that of previous period at the .05 level of significance.

Fifty-five bankers indicated that they accept second mortgages on agricultural loans, while twenty-six stated that they would not accept any security interest beyond a first lien. Many respondents indicated that this was done as an added security measure, not as the only security interest.

There were no statistically significant changes in maturities for any of the four types of loans surveyed. A wide variety of responses were received (Table 18). However, a number of responses were "seasonal" or "according to demand," and thus not readily quantified. The fact that there was no apparent pattern of change in the means would seem to indicate that maturities have basically remained unchanged.

TABLE 18
MATURITIES OF AGRICULTURAL LOANS

TYPE OF LOAN	TODAY	3 YRS AGO	5 YRS AGO
	Number of years to maturity[a]		
Farm real estate loans	8.53	7.73	9.01
Livestock operating loans	1.12	.98	1.02
Crop operating loans	.73	.72	.72
Farm machinery loans	2.67	2.58	2.53

[a]No statistically significant differences were found in any comparisons among periods.

Bankers indicated that they use several intervals for adjusting rates on variable rate loans (Table 19). Several bankers indicated that they changed rates at a number of different time

TABLE 19
INTERVALS FOR CHANGING VARIABLE INTEREST RATES

INTERVAL FOR CHANGE	Number of banks[a]
When the bank's base/prime rate changes:	38
Monthly:	13
At time of loan maturity:	17
Quarterly:	8
Semi-annually:	8
When national prime rate changes:	3

[a]Some banks indicated more than one choice.

intervals (e.g., quarterly and semi-annually, as circumstances warranted), so it is difficult to see one particular time interval tbat is most popular for adjusting rates. The most popular response was when the bank's base/prime rate changed, but the question did not specify an exact time interval for this.

Concerning tbe quality of agricultural loan portfolios of all banks, 43 percent of agricultural debt was renewed rather than repaid 5 years ago, 51 percent was renewed 3 years ago, and 61 percent has been renewed today, a statistically significant increase over the five-year period. This change seems to indicate a general deterioration in the quality of agricultural loan portfolios.

One response to deteriorating farm loan quality is the use of Farmers Home Administration loan guarantees. The portion of tbe agricultural loan portfolio guaranteed by Farmers Home averaged 3.18 percent for 82 banks, witb 42 banks indicating tbey bad no guaranteed loans at all. Only 8 banks indicated tbat at least 10 percent of their farm loan portfolio was guaranteed. However, 51 banks expected tbat their use of Farmers Home guarantees would increase in the near future; only 26 banks did not expect their use of tbis program to increase. On average, only 2.37 percent of tbe agricultural loan portfolios were involved in Farmers Home's recent debt restructuring program.

Fifty-one bankers indicated tbat they were willing to sell farm loans in the secondary market while 33 indicated that they were not be willing to do so. However, only 15 bankers were able to make such sales, while 57 said tbey were unable to do so. Concerning their reasons for being unwilling or unable, two

responses were quite common: 41 banks said that they were not sufficiently familiar with the secondary market, and 46 banks indicated that there was no apparent demand for farm loans. Twenty-seven bankers found the paperwork and other complexities to be excessive, as well. Write-in responses could be summarized as saying that these banks bad no need or desire to sell these loans.

In summary, agricultural lending practices appear to have become more intensive in investigation and more conservative in assuming credit risk. Informational requirements are much greater today tban in tbe past. Loan proceeds are typically smaller today tban earlier for a given amount of collateral. Quality of agricultural loan portfolios, as measured hy loan renewals, bas deteriorated in the last few years. Bankers appear prepared to take furtber steps to deal with credit risk -- via loan guarantee programs, for example -- should conditions continue to worsen.

GROUP COMPARISONS OF BANKS

A closer examination of the data was made to determine bow different types of banks are affected by risk and how bankers bave responded to it. Tbe banks were classified by five variables: type (agricultural versus nonagricultural), size, region, management experience, and current overall CAMEL rating. The practices and performance of these groups were then compared.

Type. Banks were classified as agricultural using tbe Federal Reserve's definition: a hank with at least 25 percent of

its loan portfolio in agricultural loans was considered an agricultural bank. Sixty-seven banks were classified as agricultural, while twenty-five banks were identified as nonagricultural. Agricultural banks and nonagricultural banks appear to have been affected differently by the changing banking environment. Some differences also exist between the groups with regard to their perceptions of risk and a few risk measurement and management practices.

A noticeable difference was seen in average size of the two groups. On average, agricultural banks had 31.9 million dollars in assets, while nonagricultural banks averaged 66.6 million dollars in total assets. Agricultural banks' capital/assets ratios were marginally higher than their counterparts (9.5 percent to 9.1 percent), as were their loan/deposit ratios (53.5 percent to 51.0 percent). Agricultural banks' average return on assets was 1.14 percent, while nonagricultural banks' return averaged 1.21 percent. Chief executive management experience averaged 9.9 years for agricultural banks and 7.8 years for nonagricultural banks. On average, 54.9 percent of agricultural banks' loans were farm loans, while 10.4 percent of nonagricultural banks' loans were farm loans.

Both groups identified credit risk as the most important type of risk, and both groups consistently ranked cost of funds risk second (Table 20). There were, however, significant differences in the rankings of investment and regulatory risk for the future and today. Nonagricultural banks considered investment risk to be relatively more important, while agricultural banks viewed regulatory risk as relatively more important. Liquidity

risk and solvency risk were not regarded significantly differently by tbe two groups.

TABLE 20
RANKINGS OF RISKS: AGRICULTURAL VERSUS NONAGRICULTURAL BANKS

TYPE OF RISK	FUTURE	TODAY	3 YRS AGO	5 YRS AGO
	Average rankings[a]			
Credit risk:				
Agricultural banks	1.69	1.57	2.18	2.61
Nonagricultural banks	1.48	1.60	1.86	1.86
Investment risk:				
Agricultural banks	4.41	4.45	3.74	3.48
Nonagricultural banks	3.64	3.44	3.26	3.50
Liquidity risk:				
Agricultural banks	3.70	4.00	3.65	3.31
Nonagricultural banks	3.64	3.60	3.22	3.41
Cost of funds risk:				
Agricultural banks	3.20	3.28	2.58	2.73
Nonagricultural banks	2.80	2.68	2.83	3.00
Solvency risk:				
Agricultural banks	4.39	4.43	4.77	4.54
Nonagricultural banks	5.12	5.32	5.18	5.18
Regulatory risk:				
Agricultural banks	3.57	3.49	4.32	4.47
Nonagricultural banks	4.24	4.20	4.49	4.18

[a]Rankings went from 1 for tbe most important to 6 for the least important.

Tbe general bealth of agricultural banks tended to be poorer than that of nonagricultural banks (Table 21). The overall CAMEL ratings for agricultural banks declined from an average of 1.53 five years ago to an average of 2.11 today, while nonagricultural banks actually improved their average rating from 1.65 to 1.56 over the same period. In examining tbe five components of the

TABLE 21
OVERALL CAMEL RATING AND CAMEL COMPONENTS:
AG BANKS VERSUS NON-AG BANKS

FACTOR RATED	TYPE OF BANK	TODAY	3 YRS AGO	5 YRS AGO
		Average ratings[a]		
Overall CAMEL[b]:	Ag	2.11	1.72	1.53
	Non-ag	1.56	1.61	1.65
Capital adequacy:	Ag	1.58	1.50	1.48
	Non-ag	1.33	1.39	1.73
Asset quality:	Ag	2.23	1.89	1.70
	Non-ag	1.92	1.88	1.87
Management ability[b]:	Ag	1.58	1.67	1.63
	Non-ag	1.25	1.42	1.52
Earnings record:	Ag	2.13	1.79	1.76
	Non-ag	1.79	1.88	2.04
Liquidity position[b]:	Ag	1.48	1.60	1.64
	Non-ag	1.13	1.46	1.52

[a]Ratings went from 1 for excellent health to 5 for poorest bealtb.
[b]Statistical differences existed between tbe ratings of tbe two groups at tbe .10 level of significance.

tbe CAMEL rating, every factor was rated lower today for agricultural banks; two factors -- management ability and liquidity -- were statistically different at the .10 level. One bypotbesis for these differences considers the nature of agricultural credit conditions; farmers' poor financial performance may have caused tbe performance of agricultural banks to suffer.

Tbere were few significant differences in risk measurement practices between the groups. One difference was seen in the measurement of credit risk: in comparison to agricultural banks, nonagricultural banks tended to place relatively more emphasis on ninety-day delinquencies (Table 22). The differences

TABLE 22
RANKINGS OF CREDIT RISK MEASURES:
AG BANKS VERSUS NON-AG BANKS

MEASURE OF RISK	TIME PERIOD	AG	NON-AG
		Average rankings[a]	
Loan losses: dollar volume:	Today	2.16	2.13
	3 yrs ago	2.07	2.43
	5 yrs ago	2.51	2.24
Loan losses: % of loans:	Today	3.18	3.30
	3 yrs ago	3.09	3.10
	5 yrs ago	3.22	3.05
Loan delinquencies: 30 days:	Today	3.72	3.48
	3 yrs ago	3.68	3.19
	5 yrs ago	3.31	3.29
Loan delinquencies: 90 days:	Today	2.85	2.39
	3 yrs ago	2.89	2.29
	5 yrs ago	2.79	2.24
Forecasts of business conditions:	Today	3.17	3.87
	3 yrs ago	3.41	4.19
	5 yrs ago	3.29	4.14

[a]Rankings went from 1 for the most important to 5 for the least important.

for loan delinquencies were statistically significant at the .10 level for three and five years ago, although the difference was not significant for today.

The quality of the agricultural loan portfolio as measured by rate of loan renewal appeared to differ between the two groups today. Renewals today amounted to 63.9 percent of agricultural banks' farm loans, compared to 51.2 percent of those for nonagricultural banks, a difference which was statistically significant. Differences were not significant three and five years ago (Table 23).

Even though both groups experienced an increase in renewals,

TABLE 23
FARM LOAN QUALITY AND DIVERSIFICATION OPPORTUNITIES:
AG BANKS VERSUS NON-AG BANKS

	TODAY	3 YRS AGO	5 YRS AGO
Percent of farm loans renewed rather than repaid[a]:			
Agricultural banks	63.9	52.7	43.9
Nonagricultural banks	51.2	45.2	40.5
Use of loan diversification[a,b]:			
Agricultural banks	2.25	2.47	2.58
Nonagricultural banks	1.84	2.13	2.27

[a]Statistical differences existed among the groups at the .10 level of significance for TODAY only.
[b]Rating scale: 1) extensive use
2) limited use
3) not used

renewals at agricultural banks increased more quickly. This creates a dilemma for many agricultural banks since they appear to be unable or unwilling to diversify their loan portfolios. Agricultural banks indicated that loan diversification received limited use, while nonagricultural banks indicated more extensive use of this practice (Table 23).

In summary, there appear to be differences between agricultural and nonagricultural banks in the aggregate with regard to overall health today. Differences in performance do not appear to be the result of differences in practices, since few differences existed in risk measurement and management.

Size. All 92 banks were classified by the amount of their total assets into 1 of 5 categories: Size 1 for banks with less than 10 million dollars in assets, Size 2 for banks having between 10 million and 25 million dollars in assets, Size 3 for those having between 25 million and 50 million dollars in assets,

Size 4 for banks having between 50 million and 100 million dollars in total assets, and Size 5 for banks having more than 100 million dollars in total assets. The distribution among these groups showed Size 1 with 13 banks, Size 2 with 29 banks, Size 3 with 31 banks, Size 4 with 14 banks, and Size 5 with 5 banks (Table 24). Because some of these groups were sufficiently small in size, statistical analyses were not always reliable. An interesting pattern developed in several instances where Size 1 banks and Size 4 banks behaved most similarly, even though they were quite different in size. The proportion of agricultural to nonagricultural banks declined as size increased -- only one Size 1 bank was nonagricultural, while only one Size 5 bank was agricultural.

TABLE 24
COMPARISON OF BANK CHARACTERISTICS AMONG SIZE GROUPS

SIZE OF BANKS (in millions of $)	<10	10≤25	25≤50	50≤100	>100
Capital/asset ratio (%)	9.5	10.0	9.0	9.2	8.7
Loan/deposit ratio (%)	50.8	54.1	50.9	54.9	56.5
Return on assets (%)	.73	1.61	1.08	.96	.82
Years as CEO	9.5	11.9	8.8	7.9	7.8
% of all banks	14.2	31.5	33.7	15.2	5.4
Ag banks in group (%)	92.4	82.8	74.2	50.0	20.0
Non-ag banks in group (%)	7.6	17.2	25.8	50.0	80.0

There have been few significant differences in bank performance as measured by the CAMEL ratings (Table 25). The smallest banks (<$10 million) and $50-100 million banks were rated significantly below the other groups three years ago. This

TABLE 25
COMPARISON OF OVERALL CAMEL RATING AND CAMEL COMPONENTS AMONG SIZE GROUPS

SIZE OF BANKS: (in millions of $)	<10	10≤25	25≤50	50≤100	>100	ALL
			Average ratings[a]			
Overall CAMEL:						
TODAY	2.08	1.86	2.10	1.93	1.40	1.96
3 YRS AGO[b]	2.10	1.46	1.67	2.07	1.00	1.69
5 YRS AGO	1.80	1.46	1.50	1.92	1.00	1.57
Capital adequacy:						
TODAY[b]	2.00	1.29	1.59	1.46	1.40	1.51
3 YRS AGO	2.11	1.43	1.31	1.50	1.25	1.47
5 YRS AGO	1.75	1.52	1.37	2.00	1.25	1.55
Asset quality:						
TODAY	2.00	2.00	2.31	2.31	1.80	2.14
3 YRS AGO[b]	2.22	1.75	1.71	2.43	1.50	1.89
5 YRS AGO[b]	1.88	1.78	1.46	2.42	1.25	1.75
Management ability:						
TODAY	1.73	1.50	1.41	1.46	1.40	1.49
3 YRS AGO[b]	2.33	1.50	1.33	2.00	1.00	1.60
5 YRS AGO[b]	2.13	1.48	1.39	2.17	1.00	1.59
Earnings record:						
TODAY	2.60	1.78	2.10	1.77	2.60	2.04
3 YRS AGO[b]	2.63	1.68	1.59	2.14	1.50	1.81
5 YRS AGO	2.71	1.70	1.64	2.17	1.75	1.85
Liquidity position:						
TODAY	1.82	1.36	1.34	1.23	1.20	1.38
3 YRS AGO	1.78	1.57	1.41	1.86	1.00	1.56
5 YRS AGO	1.63	1.63	1.50	2.00	1.00	1.61

[a]Ratings went from 1 for excellent health to 5 for poorest health.
[b]Statistical differences existed among the groups at the .10 level of significance.

difference was not statistically significant today, however. This pattern of having differences three years ago followed by universal deterioration is seen in the CAMEL components of asset quality, management ability, and earnings record, as well. Thus, it appears that banks of all sizes are now experiencing more

difficulty.

There appear to be no major differences among the groups in the measurement of credit risk or cost of funds risk (Table 26). In measuring credit risk, loan losses became less important and delinquencies became more important as bank size decreased. For cost of funds risk, the use of gaps as a measure was ranked much higher by >$100 million banks, relative to <$10 million banks; the intermediate groups ranked this factor second consistently.

TABLE 26
COMPARISON OF CREDIT RISK AND COST OF FUNDS RISK
MEASUREMENT AMONG SIZE GROUPS

SIZE OF BANKS (in millions of $)	<10	10≤25	25≤50	50≤100	>100	ALL
MEASURES OF RISK	Average rankings for TODAY					
CREDIT RISK[a]:						
Loan losses dollar volume:	2.42	2.25	2.03	2.14	1.50	2.15
Loan losses % of loans:	3.42	3.25	3.47	2.71	2.25	3.21
Loan delinquencies 30 days:	3.50	3.43	3.87	3.64	4.25	3.66
Loan delinquencies 90 days:	2.33	2.68	3.00	2.43	3.25	2.73
Business forecasts:	3.75	3.25	2.93	3.86	4.25	3.35
COST OF FUNDS RISK[b]:						
Gaps:	3.75	2.66	2.69	2.71	1.67	2.78
Spreads:	2.25	2.10	1.65	2.00	2.33	1.94
Rates paid by competition:	3.92	3.62	3.88	3.71	4.67	3.80
Time & savings deposits/total deposits:	4.58	5.07	5.31	4.93	6.00	5.12
Maturities of time deposits:	3.83	4.52	4.62	4.71	5.00	4.51
Projected interest rate changes:	4.50	4.79	4.69	4.50	3.67	4.65
Operating costs:	4.82	5.24	5.04	4.92	4.33	4.79

[a]Rankings went from 1 for the most important to 5 for the least important.
[b]Rankings went from 1 for the most important to 7 for the least important.

No statistically significant differences appeared in spreads or the use of gaps in cost of funds risk management (Table 27). The range of spreads among the groups narrowed over time. The upper limits of these ranges declined over time, as well. Spreads for the 5 groups ranged from 5.3 percent to 3.6 percent 5 years ago, while they ranged from 4.4 percent to 3.8 percent today. The smallest banks had the smallest spreads in every period, which seems contrary to the notion that these small banks attempt to maintain wider spreads in lieu of more complicated management techniques like gap management. The use of gap management did differ among the groups although the differences were not statistically significant. The use of gaps today varied almost precisely with size, with smaller banks showing only limited use and the largest banks showing much more extensive use. Adoption of gap management procedures appears to be

TABLE 27
COMPARISON OF COST OF FUNDS MANAGEMENT:
GAPS AND SPREADS AMONG SIZE GROUPS

SIZE OF BANKS (in millions of $)	<10	10≤25	25≤50	50≤100	>100	ALL
Use of gaps[a,b]:						
TODAY	1.92	1.64	1.43	1.50	1.40	1.57
3 YRS AGO	2.33	2.04	2.04	2.29	1.50	2.09
5 YRS AGO	2.50	2.64	2.54	2.67	2.75	2.60
Spreads[b]: (in %)						
TODAY	3.82	3.97	4.34	3.92	4.27	4.07
3 YRS AGO	3.96	4.81	4.61	4.06	4.43	4.51
5 YRS AGO	3.55	4.42	4.45	5.26	3.98	4.45

[a]Rating scale: 1) extensive use
2) limited use
3) not used

[b]No statistical differences were found among the groups at the .10 level of significance.

spreading in all size groups, however.

Tbe quality of tbe agricultural loan portfolios as measured by renewal rate declined for all groups over tbe five year period (Table 28). Altbough the differences appear to be sizable, none was statistically significant. The <$10 million banks, tbe most predominantly agricultural group, had the highest renewal rate as renewals climbed from 51 percent of their farm loan portfolios 5 years ago to 73.8 percent today. The >$100 million banks experienced a very large increase in renewals, which went from only 19 percent in 1980 to 66 percent today. Poorer agricultural credit conditions bave reached even tbe largest Kansas banks today, althougb these conditions do not pose nearly tbe same threat to the large banks as they do to the small banks.

TABLE 28
COMPARISON OF QUALITY OF AGRICULTURAL LOAN PORTFOLIOS AMONG SIZE GROUPS

SIZE OF BANKS (in millions of $)	<10	10≤25	25≤50	50≤100	>100	ALL
% of agricultural loan renewed rather than repaid[a]:						
TODAY	73.8	64.1	56.7	52.3	66.3	61.0
3 YRS AGO	57.1	56.2	46.3	46.8	36.5	50.9
5 YRS AGO	50.8	49.0	38.6	37.2	19.0	43.0

[a]No statistical differences were found among tbe groups at the .10 level of significance.

In summary, it appears that performance bas deteriorated for banks of all sizes. Wbile the importance of agricultural lending clearly declined as bank size increased, bank performance did not consistently improve as size increased. Tbe largest banks continued to sbow tbe best ratings, although their performance has

worsened over time. No statistically significant differences were found in important areas of risk measurement or management.

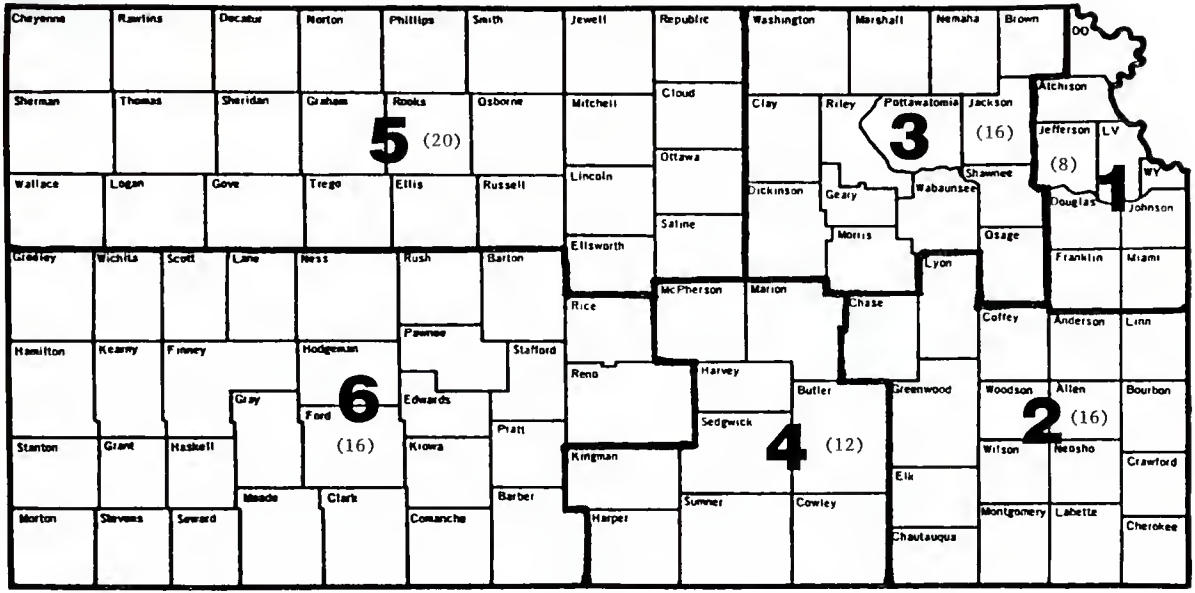
Region. Banks were classified into regions using the Kansas Bankers Association regional boundaries (Figure 1). Eight banks were located in the smallest region, Region 1, 16 banks were located in Region 2, another 16 banks were located in Region 3, 11 banks were located in Region 4, 18 banks were located in Region 5, and 16 banks were located in Region 6. Fifty-seven out of 105 total counties were represented, with fairly even distribution of respondents among the regions. There were only a few statistically significant differences in variables as region varied.

No statistically significant differences were found between the regions according to bank size, although the mean sizes for the various regions were spread over a sizable range (Table 29). At the upper extreme, the 11 banks in Region 4 averaged 61.8 million dollars in total assets, while at the lower extreme the 18 banks in Region 5 averaged only 24.8 million dollars in assets. Region 2 banks and Region 6 banks were the other two smallest-sized groups in terms of total assets.

TABLE 29
DIFFERENCES IN BANK SIZE BY REGION

REGION:	1	2	3	4	5	6
Average assets: (in millions of dollars)	40.2	32.0	55.6	61.8	24.8	33.6

Figure 1. Kansas Bankers Association Regional Banking Districts.



Numbers in parentheses indicate the number of respondent banks in each region.

The three regions having, on average, the smallest banks were rated as having more problems as reflected in significant differences in CAMEL ratings among the regions (Table 30). The distinction between the three regions having the largest banks, on average, and the three regions having the smallest banks

TABLE 30
OVERALL CAMEL RATING AND CAMEL COMPONENTS:
COMPARISONS AMONG REGIONS

REGION:	1	2	3	4	5	6
FACTOR RATED	Average ratings[a]					
Overall CAMEL:						
TODAY[b]	1.63	2.25	1.73	1.55	2.00	2.19
3 YRS AGO	1.38	1.80	1.43	1.80	1.67	2.00
5 YRS AGO	1.50	1.43	1.36	1.90	1.60	1.80
Capital adequacy:						
TODAY	1.63	1.64	1.36	1.27	1.33	1.57
3 YRS AGO	1.86	1.57	1.29	1.00	1.50	1.57
5 YRS AGO	1.86	1.69	1.29	1.33	1.81	1.46
Asset quality:						
TODAY[b]	1.88	2.64	1.86	1.64	2.06	2.64
3 YRS AGO	1.75	2.07	1.57	2.00	1.94	2.14
5 YRS AGO	1.63	1.85	1.29	2.00	1.88	2.08
Management ability:						
TODAY	1.13	1.64	1.43	1.27	1.44	1.64
3 YRS AGO	1.75	1.93	1.29	1.44	1.63	1.71
5 YRS AGO	1.75	1.85	1.21	1.56	1.69	1.69
Earnings record:						
TODAY	1.88	2.43	1.53	1.55	2.12	2.21
3 YRS AGO	1.75	2.07	1.69	1.44	1.94	1.79
5 YRS AGO	1.88	2.00	1.69	1.67	2.00	1.77
Liquidity position:						
TODAY	1.25	1.71	1.36	1.27	1.28	1.43
3 YRS AGO	1.50	1.57	1.43	1.44	1.50	2.00
5 YRS AGO	1503	1.54	1.50	1.56	1.56	2.08

[a]Ratings went from 1 for excellent health to 5 for poorest health.
[b]Statistical differences were found among the groups at the .10 level of significance.

occurred again in the ratings of three CAMEL components -- asset quality, management ahility, and earnings record. The pattern is slightly different but still apparent for capital adequacy and liquidity. However, only differences for asset quality were statistically significant.

Decline in quality of the agricultural loan portfolio roughly parallels the conditions seen ahove (Tahle 31). Material increases in renewals occurred in all regions, however, so the prohlems do not appear to he limited to only a few regions of the state. Both Regions 2 and 5 consistently showed the highest levels of renewals. However, while there appeared to he some tendencies for differences among the groups, none of these differences was statistically significant. Diversification in

TABLE 31
PROPORTION IN FARM LOANS, FARM LOAN RENEWALS, AND LENDING DIVERSIFICATION: COMPARISON AMONG REGIONS

REGION:	1	2	3	4	5	6
Farm loans/ all loans (%)	23.8	34.6	45.4	33.0	58.5	57.9
Ag loan renewal rate (%)						
TODAY	65.7	72.3	53.5	43.7	65.3	54.6
3 YRS AGO	53.3	61.3	45.0	33.1	58.0	41.8
5 YRS AGO	40.4	54.5	34.5	26.4	51.7	37.5
Use of diversification in lending[b]:						
TODAY	2.00	2.13	2.00	1.81	2.41	2.25
3 YRS AGO	2.13	2.62	2.21	2.00	2.60	2.38
5 YRS AGO	2.13	2.83	2.50	2.13	2.67	2.42

[a]Statistical differences were found among the groups at the .10 level of significance.
[b]Rating scale: 1) extensive use
2) limited use
3) not used

lending was used less by bankers in Regions 2, 5, and 6, which again indicates that these banks will continue to he dependent upon agriculture while that industry is depressed.

In summary, it appears that performance has heen somewhat weaker in regions with greater concentrations of smaller, agricultural banks. These banks' earnings and asset quality tend to be weaker, and they appear to have fewer viable lending alternatives while farm credit conditions are poor. Overall performance appears to have declined somewhat for banks in all regions, however.

Management. Comparisons among groups of banks differing according to management experience placed more focus on differences in risk measurement and management than on bank performance. Only the three highest-ranked measures for each type of risk were compared for differences among the groups. Comparisons were made only for the current time period, since 21 of the 88 bankers involved indicated that they had 2 or less years experience as chief executive officers. The 88 respondents were classified into 4 categories: Group 1 for bankers with 3 or less years of experience, Group 2 for bankers having 4 to 7 years of experience, Group 3 for bankers with 8 to 10 years experience, and Group 4 for hankers with 11 or more years of experience as chief executive officers. Thirty hankers comprised Group 1, 18 bankers were in Group 2, 9 bankers were in Group 3, and 31 hankers made up Group 4. There was another curious pattern of hehavior in that Groups 1 and 4 were often similar in behavior even though they differed most in experience. Several statistically significant differences were found

in the perceptions and practices of the groups.

Bank performance did not differ significantly between the groups in the current period. The overall CAMEL ratings were clustered around the average for all banks, with Group 4 (≥11 years) having the lowest average at 2.03 and Group 1 (≤3 years) having the highest average at 1.85 (Table 32). Of the five CAMEL components, four -- capital adequacy, asset quality, earnings record, and liquidity position -- showed no statistically significant differences. A significant difference was found in the rating of management ability, where Group 4 (≥11 years) bankers were rated significantly below the rest. On the other CAMEL factors, Group 4 bankers also tended to be rated lower, but there appeared to be no substantial "cumulative effect" of this trend in the overall CAMEL ratings.

TABLE 32
OVERALL CAMEL RATING AND CAMEL COMPONENTS:
COMPARISONS AMONG MANAGEMENT GROUPS

YEARS OF EXPERIENCE:	≤3	4-7	8-10	≥11	ALL
FACTOR RATED	Average rating for TODAY[a]				
Overall CAMEL	1.85	2.00	2.00	2.03	1.96
Capital adequacy	1.41	1.61	1.56	1.53	1.51
Asset quality	2.16	2.00	2.00	2.30	2.14
Management ability[b]	1.47	1.17	1.33	1.77	1.49
Earnings record	2.07	1.89	2.11	2.07	2.04
Liquidity position	1.41	1.11	1.44	1.50	1.38

[a]Ratings went from 1 for excellent health to 5 for poorest health.
[b]Statistical differences were found among the groups at the .10 level of significance.

Only one material difference in perceptions of risk appeared among the groups. Group 4 (≥11 years) perceived regulatory risk as heing relatively more important hoth in the future and today. The rankings of regulatory risk hy Group 4 were much higher in these two periods than they were for three and five years ago (Tahle 33). Group 4 ranked regulatory risk higher and higher over time, while Groups 2 (4-7 years) and 3 (8-10 years) did not follow this pattern; in fact, Group 3 perceived regulatory risk as hecoming relatively less important over time. One hypothesis for explaining changing attitudes toward regulatory risk considers perceived changes in examination attitudes, particularly toward classification of agricultural loans. However, this does not appear to be a valid reason for these differences hecause there do not appear to he differences among the management groups with respect to size and type of clientele.

TABLE 33
RANKING OF REGULATORY RISK: COMPARISON OF MANAGEMENT GROUPS

YEARS OF EXPERIENCE:	≤3	4-7	8-10	≥11	ALL
TIME PERIOD	Average rankings[a] for Regulatory Risk:				
FUTURE[b]	4.00	4.06	4.56	3.06	3.75
TODAY	3.82	4.17	4.11	3.13	3.68
3 YRS AGO	4.81	4.39	4.00	4.06	4.36
5 YRS AGO	4.67	4.22	3.88	4.40	4.39

[a]Rankings went from 1 for the most important to 6 for the least important.
[b]Statistical differences were found among the groups at the .10 level of significance.

The top three measures of credit risk were the dollar volume of loan losses, ninety-day loan delinquencies, and loan losses as

a portion of all loans. None of these factors showed any statistically significant differences in rankings among the groups when measured at the .10 level of significance (Tahle 34). Group 1 (≤3 years) bankers tended to rank delinquencies as a relatively more important measure, although the dollar volume of loan losses was still their most important measure.

TABLE 34
RANKINGS OF MEASURES OF CREDIT RISK:
COMPARISONS AMONG MANAGEMENT GROUPS

YEARS OF EXPERIENCE:	≤3	4-7	8-10	≥11	ALL
MEASURE OF RISK[a]	Average rankings for TODAY[b]				
Loan losses:					
dollar volume	2.31	1.88	2.00	2.17	2.15
% of loans	3.31	3.06	3.11	3.23	3.21
Loan delinquencies:					
90 days	2.38	3.06	2.78	2.90	2.73

[a]No statistical differences were found among the groups at the .10 level of significance.
[b]Rankings went from 1 for the most important to 5 for the least important.

The top three measures of investment risk showed one statistically significant difference in rankings between the groups (Table 35). Group 4 (≥11 years) bankers viewed volatility of interest rates as heing relatively less important, compared to the other groups. Group 3 (8-10 years) was the outlier in the ranking of investments' maturities, as these bankers viewed this measure with less regard. There was a wide range of views with regard to the importance of marketahility; rankings here were significantly different.

TABLE 35
RANKING OF MEASURES OF INVESTMENT RISK:
COMPARISON AMONG MANAGEMENT GROUPS

YEARS OF EXPERIENCE:	≤3	4-7	8-10	≥11	ALL
MEASURE OF RISK	Average rankings for TODAY[a]				
Volatility of interest rates:	2.06	2.25	2.25	2.93	2.41
Maturities of investments:	2.73	2.31	3.38	2.55	2.69
Marketability of investments[b]:	3.91	3.25	3.88	3.03	3.49

[a]Rankings went from 1 for the most important to 6 for tbe least important.
[b]Statistical differences were found among the groups at the .10 level of significance.

Tbe four management groups viewed measures of cost of funds risk differently (Table 36). Eacb group ranked spreads as tbe most important measure today, but Group 3 (8-10 years) bankers were significantly different in ranking tbe rates paid by competitors as more important tban gaps. One hypotbesis for tbese

TABLE 36
RANKING OF MEASURE OF COST OF FUNDS RISK:
COMPARISONS AMONG MANAGEMENT GROUPS

YEARS OF EXPERIENCE:	≤3	4-7	8-10	≥11	ALL
MEASURE OF RISK	Average rankings for TODAY[a]				
Gaps[b]	2.88	2.00	4.00	2.76	2.78
Spreads	1.97	1.75	2.13	1.97	1.94
Rates paid by competition[b]	3.67	4.25	2.63	4.03	3.80

[a]Rankings went from 1 for the most important to 7 for the least important.
[b]Statistical differences were found among the groups at the .10 level of significance.

differences considers the smaller size of Group 3 banks. Gap

management seems to find more extensive use as bank size increases; Group 3 banks averaged only 27.4 million dollars in assets, so their smaller size may be at least part of the explanation for these differences.

One significant difference in measurement of regulatory risk was found. Group 4 (≥11 years) bankers ranked regulatory publications and contacts much higher, on average, than did the other groups (Table 37). This same group viewed regulatory risk as being relatively more important than the other groups.

TABLE 37
RANKING OF MEASURES OF REGULATORY RISK:
COMPARISONS AMONG MANAGEMENT GROUPS

YEARS OF EXPERIENCE:	≤3	4-7	8-10	≥11	ALL
MEASURE OF RISK	Average rankings for TODAY[a]				
Regulatory publications and contacts[b]	2.21	2.00	2.13	1.48	1.92
Pending federal legislation	2.16	1.94	2.50	2.29	2.19

[a]Rankings went from 1 for the most important to 4 for the least important.
[b]Statistical differences were found among the groups at the .10 level of significance.

No material differences were found between the groups in the measurement of liquidity risk and solvency risk.

Attitudes toward monitoring credit and regulatory risk were also different. Bankers in Groups 1 (≤3 years) and 4 (≥11 years) perceived credit risk as less difficult to measure, in comparison to bankers in Groups 2 (4-7 years) and 3 (8-10 years) (Table 38). Groups 1 and 4 placed relatively greater emphasis on regulatory risk and its measurement.

TABLE 38
DIFFICULTY IN MEASURING RISKS:
COMPARISONS AMONG MANAGEMENT GROUPS

YEARS OF EXPERIENCE:	≤3	4-7	8-10	≥11	ALL
TYPE OF RISK[a]		Average rankings[b]			
Credit risk	2.67	1.53	2.25	2.45	2.34
Regulatory risk	2.19	3.41	3.88	2.33	2.63

[a]Statisical differences were found among the groups for both risks at the .10 level of significance.
[b]Rankings went from 1 for the most important to 6 for the least important.

No significant differences were found in the practices of pricing certificates of deposits weekly, limiting dividends to build capital, annually reviewing lending and investment policies, and annually reviewing staffing needs (Table 39). Group 4 (≥11 years) bankers, whose banks were generally rated lower, used limiting dividends more extensively than others. Group 2 (4-7 years) bankers and Group 3 (8-10 years) bankers were quite different in their use of annual reviews of goals and annual reviews

TABLE 39
RATINGS OF VARIOUS RISK MANAGEMENT PRACTICES:
COMPARISON AMONG MANAGEMENT GROUPS

YEARS OF EXPERIENCE:	≤3	4-7	8-10	≥11	ALL
RISK RESPONSE[a]		Average ratings for TODAY[a]			
Pricing CD's weekly	1.15	1.28	1.11	1.37	1.24
Review of lending policy	1.39	1.33	1.44	1.27	1.34
Review of staffing needs	1.61	1.39	1.67	1.63	1.58
Review of bank goals	1.48	1.33	1.89	1.60	1.53
Limiting dividends	1.85	2.06	1.78	1.57	1.79

[a]Rating scale: 1) extensive use
2) limited use
3) not used
[b]No statistical differences appeared among the groups at the .10 level of significance.

of staffing needs. In both cases Group 3 showed the most limited use and Group 2 bankers showed the most extensive use. Reasons for these differences are not immediately apparent.

Significant differences appeared between the groups in their views on barriers to the use of financial futures in hedging cost of funds risk (Table 40). Lack of qualified personnel was ranked much higher, on average, by Group 3 (8-10 years) bankers. Riskiness of futures trading was not ranked significantly differently by the groups, although Group 3 did rank it lower than all other groups. There was a statistically significant difference in the ranking of presence of better alternatives. Again, Group 3 ranked this much lower, on average, than all other groups; Group 3 bankers also considered resistance by both regulators and their boards of directors to be more important than the presence of better alternatives.

TABLE 40
RANKINGS OF BARRIERS TO USE OF FINANCIAL FUTURES IN COST OF FUNDS RISK MANAGEMENT: COMPARISON AMONG MANAGEMENT GROUPS

YEARS OF EXPERIENCE:	≤3	4-7	8-10	≥11	ALL
BARRIER TO RESPONSE	Average rankings[a]				
No qualified officers:	2.41	2.71	1.11	2.07	2.22
Riskiness of futures:	2.38	2.76	3.56	2.63	2.67
Better management alternatives[b]:	3.14	2.94	4.11	3.15	3.21

[a]Rankings went from 1 for the most important to 6 for the least important.
[b]Statistical differences were found among the groups at the .10 level of significance.

A final difference among the groups appeared in the comparison of the qualities of their agricultural loan portfolios. The

average proportion of renewals for the 4 groups were 49.4 percent for Group 1 ($\leq$3 years), 64.0 percent for Group 4 ($\geq$11 years), 72.1 percent for Group 3 (8-10 years), and 73.2 percent for Group 2 (4-7 years). Group 1 was obviously the outlier. Group 1 banks did receive the highest average CAMEL rating among the four groups, but Group 1 did not lead the other banks in its rating for asset quality. Groups 2 and 3 had significantly more renewals but their asset quality was rated approximately the same. Thus, the data does not appear to be consistent, or some important consideration has been overlooked in explaining these differences.

In summary, management experience has proven to be the source of some differences among banks. One difference was the differing perspective that most senior bankers had toward regulatory risk and its impact upon their banks. The senior group, in comparison to their more junior comrades, consistently viewed regulatory risk as being relatively more important and relatively more difficult to measure. No major differences in bank performance or risk management practices were found among the four management groups.

CAMEL rating. The final set of comparisons examined differences in characteristics and practices of banks as their self-rated current CAMEL rating varied. Twenty-seven banks indicated a 1 rating, 45 banks indicated a 2 rating, 14 banks indicated a 3 rating, 3 banks indicated a 4 rating, and 1 bank indicated a 5 rating. Because so few banks were rated 4 or 5, the focus of the comparisons was on groups indicating 1, 2, or 3 ratings.

Differences in the overall CAMEL ratings were consistent with differences in tbe five CAMEL components, as significant differences appeared among the groups for all five components (Table 41). Two other characteristics were significantly

TABLE 41
CAMEL COMPONENTS: COMPARISONS AMONG GROUPS
BY OVERALL CAMEL RATING

CAMEL GROUP:	1	2	3	4	5
CAMEL COMPONENT[a]	Average ratings for TODAY[b]				
Capital adequacy	1.15	1.45	2.08	2.33	3.00
Asset quslity	1.35	2.17	3.23	4.00	2.00
Management ability	1.15	1.43	2.15	2.67	1.00
Earnings record	1.36	1.93	2.85	4.67	4.00
Liquidity position	1.08	1.48	1.46	2.67	1.00

[a]Statistical differences were found among the groups for all five components at tbe .10 level of significance.
[b]Ratings went from 1 for excellent bealth to 5 for poorest bealtb.

different among the groups (Table 42). Return on assets varied consistenly with tbe overall CAMEL ratings, with tbe highest-rated banks having the highest return. In addition, higher-rated banks typically showed less reliance on agricultural lending. The differences in total assets and agricultural loan renewal rates were not statistically significant (Table 42).

Few significant differences were found in preferences for individual measures of risk, but other interesting trends were found (Table 43). No statistically significant differences were found in preferences for the top three measures of credit risk.

TABLE 42
BANK CHARACTERISTICS: COMPARISONS AMONG GROUPS
BY OVERALL CAMEL RATING

CAMEL GROUP:	1	2	3	4	5
	Average amounts or rates				
Total assets (in millions of $)	53.1	35.5	39.8	16.2	33.0
Return on assets[a](%)	1.56	1.16	0.44	-1.24	-1.50
Farm loans/all loans[a](%)	31.1	49.8	47.1	49.3	80.0
Ag loan renewal rate (%)	52.1	60.6	73.3	67.5	70.0

[a]Statistical differences were found among the groups at the .10 level of significance.

However, the range of rankings tended to become wider as CAMEL rating declined. No measures of investment risk were ranked significantly differently. One liquidity risk measure, the loan-/deposit ratio, was ranked significantly differently in a manner consistent with differences in performance. The highest-rated banks again had a narrow range of rankings of liquidity risk measures. Regarding cost of funds risk measurement, there were no significant differences in the rankings of the top three measures. All groups ranked spreads as clearly most important, but the range of rankings for the other measures followed the same pattern of widening as CAMEL rating declined. This same pattern was seen in the rankings of measures of solvency risk and, to a lesser extent, those of regulatory risk.

Differences in ratings for selected risk management responses do not provide clear reasons for differences in performance (Table 44). Ratings of five responses to credit risk were compared. No significant differences appeared among the groups

TABLE 43

RANKINGS FOR SELECTED MEASURES OF RISK: COMPARISONS AMONG GROUPS BY OVERALL CAMEL RATING

CAMEL GROUP:	1	2	3	4	5
MEASURES OF RISK	Average rankings for TODAY				
Credit risk[a]:					
Loan losses: $ volume	2.60	2.02	1.93	1.00	2.00
Loan losses: % of loans	3.36	3.07	3.43	3.00	4.00
90-day delinquencies	2.32	2.87	2.79	3.33	3.00
Investment risk[b]:					
Volatility of interest rates:	2.12	2.35	2.93	4.00	na[f]
Securities' maturities[e]	2.96	2.56	2.64	1.00	na
Securities' marketability	3.57	3.70	2.79	3.50	na
Liquidity risk[c]:					
Short term assets/ short term liabilities	3.48	2.54	3.07	3.67	na
Loan/deposit ratio[e]	3.88	3.37	2.86	1.00	na
Volatile deposits	3.40	3.66	2.86	1.00	na
Cost of funds risk[c]:					
Gaps	3.28	2.56	2.36	3.67	na
Spread	1.88	2.00	2.00	1.00	na
Competitors' rates	3.80	3.88	3.57	3.00	na
Solvency risk[d]:					
Loan losses	2.08	1.67	1.64	1.00	1.00
Capital/assets ratio	2.40	2.88	2.71	2.67	3.00
Regulatory risk[d]:					
Regulatory publications and contacts	2.04	2.00	1.57	1.00	3.00
Pending federal legislation	2.17	2.12	2.43	2.67	1.00

[a]Rankings went from 1 for the most important to 5 for the least important.
[b]Rankings went from 1 for the most important to 6 for the least important.
[c]Rankings went from 1 for the most important to 7 for the least important.
[d]Rankings went from 1 for the most important to 4 for the least important.
[e]Statistical differences were found among the groups at the .10 level of significance.
[f]No data were available for the Group 5 bank.

in the ratings for review of lending policies, diversification by

type of loan, geographic diversification of lending, and loan insurance. The use of loan guarantees was rated significantly differently but not in a fashion which would explain differences in performance. Ratings of other risk responses which showed no significant differences included those for weekly CD pricing, specifying amounts to be held in particular types of securities, and annually reviewing bank goals and objectives. Significant differences were found in ratings for limiting dividends and annually reviewing staff needs, but only those for reviewing staff needs were consistent with patterns of bank performance. In addition, no significant differences were found among the

TABLE 44
RISK MANAGEMENT PRACTICES: COMPARISONS AMONG GROUPS BY OVERALL CAMEL RATING

CAMEL GROUP:	1	2	3	4	5
RISK RESPONSE	Average ratings for TODAY[A]				
Review of loan policies	1.30	1.42	1.29	1.00	1.00
Diversification by loan type	2.11	2.20	1.85	2.50	3.00
Geographic diversification of lending	2.68	2.61	2.86	2.50	3.00
Use of loan insurance	1.74	1.55	1.43	1.50	2.00
Use of loan guarantees[b]	1.96	1.82	1.93	1.00	3.00
Pricing CD's weekly	1.26	1.24	1.14	1.00	1.00
Limiting dividends[b]	1.74	2.00	1.36	1.00	2.00
Annual staffing review[b]	1.30	1.42	1.29	1.00	1.00
Specifying portion of security portfolio held in particular securities	1.85	1.76	1.64	2.00	3.00
Annually review of goals	1.41	1.69	1.43	1.00	1.00
SPREAD MANAGEMENT					
Size of spread (%)	4.16	3.96	4.19	4.37	5.00

[a]Rating scale: 1) extensive use
2) limited use
3) not used

[b]Statistical differences were found among the groups at the .10 level of significance.

groups with respect to the size of spreads.

In summary, differences in bank performance were more clear than the reasons for these differences. Poor performance was typically accompanied by greater reliance on agricultural lending, wbile differences in size did not seem to account for differences in performance. Lower-rated banks tended to have more clear preferences among measures of risk; their risk measurement efforts may be focused too narrowly on just a few measures. Ratings of selected risk responses did not provide clear indications of reasons for differences in performance.

SUMMARY

Tbis chapter has provided a review of the results of the survey presented to Kansas bankers in the autumn of 1985. Ninety-two banks responded out of a total of 615 total banks surveyed, a response rate of fifteen percent. Information was collected regarding bank cbaracteristics, bankers' perceptions of risk, risk measurement practices, and risk management practices. A special section on risk responses and agricultural lending also developed information on a topic critical to many Kansas banks today.

The results sbow that bank performance bas deteriorated somewbat over the last five years with the greatest problems coming in the last three years. Tbe farm recession is an important contributing factor to tbis decline in many bankers' view. Credit risk is the predominant concern, as asset quality bas declined significantly over this time. Regulatory risk has become more important to many bankers. Cost of funds risk measurement

and management have changed significantly over time as adoption of gap management has become more extensive. Management of almost all risks has become more extensive through wider adoption and more extensive use of many risk management practices. Agricultural lending practices have also changed. Bankers now require much more information from their borrowers than earlier, and security requirements have become more conservative. Agricultural loan portfolios have deteriorated in quality, as measured by loan renewal rate.

Comparisons of several groupings of banks also pointed out some trends. It appears that agricultural banks are typically experiencing greater problems today than nonagricultural banks. Banks with lower CAMEL ratings tended to have a more narrow focus in their risk measurement efforts. Larger banks are now beginning to feel the stresses which some smaller banks were experiencing earlier. Problems are slightly more concentrated in regions of the state having relatively more small, agricultural banks, but the general decline is spreading throughout the state.

CHAPTER SIX

SUMMARY AND CONCLUSIONS

INTRODUCTION

Tbis chapter summarizes tbe information presented in earlier chapters. It includes a review of banking risks in light of cbanging economic conditions faced by Kansas banks in the last several years and bigbligbts tbe study's findings.

SUMMARY OF THE INFORMATION

Risk in banking. Financial intermediaries function in our economy to bridge tbe gap between borrowers and savers by effecting the efficient transfer of capital between these two groups. Differences exist between these two groups with regard to preferences of size, maturity, marketability, liquidity, and riskiness of financial claims; financial intermediaries resolve tbese differences by offering each group financial claims suiting their own preferences. Financial intermediaries specialize in lending and investment activities and earn profits by spreading their costs and risks over the large pool of assets with whicb they work.

Commercial banks, tbe most common type of financial intermediary, face risks that may be classified into six general areas. Credit risk is tbe risk banks face from potential delinquency or default by borrowers. Investment risk is the risk

of capital losses on tbe sale of securities before maturity. Liquidity risk is tbe risk of inadequate funding to continue bank operations. Cost of funds risk is the risk produced by unanticipated changes in banks' cost of funds. Solvency risk is the risk of bank insolvency, and regulatory risk is tbe risk of adverse changes in tbe regulatory environment. Many interrelationsbips exist between tbese types of risk, and management must coordinate all aspects of these banking risks to best control total bank risk exposure.

Events in the banking environment often contribute to banks' risk exposure, and tbe banking environment has seen numerous cbanges in the last several years. Important deregulatory changes in tbis period bave included tbe removal of interest rate ceilings on deposits, tbe promotion of greater competition among financial intermediaries, and for Kansas banks, tbe authorization of multibank holding companies. Economic events such as interest rate volatility and general recession in tbe early 1980's were also important to banks. Tbe economic event of most interest to the majority of Kansas banks has been the farm recession wbich has dragged on through most of tbe 1980's. All of tbese events have contributed to bank risk exposure through direct effects on banks themselves and tbrough indirect effects on banks' customers.

Results of the survey. A survey was used to gather tbe data necessary for tbe study's analyses. Information was solicited on the topics of bank cbaracteristics, perceptions of risk, measures of risk, and responses to risk, particularly in tbe area

of agricultural lending. These questions were to determine which risks bankers perceive as being most important to the success of their operations, to examine how bankers measure or monitor these risks, to determine how bankers respond to these risks, and to examine how all of these factors have changed over time. Ninety-two of 615 banks responded, a response rate of 15 percent.

The respondent banks were typically small, agriculturally-oriented banks. Total assets for all banks averaged 40.6 million dollars, with the median at 26.2 million dollars. The important ratios of loans to deposits and capital to assets seemed conservative, with average values of 52.8 percent and 9.4 percent, respectively. Return on assets for all banks averaged 1.16 percent. Most banks were owned by holding companies, and the vast majority of these holding companies controlled only one bank. Fifty-seven counties were represented in the survey, with representative responses from all regions of the state. Chief executive officers averaged 9.4 years of experience in that position, although one-third of the respondents indicated they had 3 or less years of experience. Approximately three-fourths of the banks would be considered agricultural banks, having at least 25 percent of their loan portfolios in farm loans. The average portion of farm loans to all loans was 45 percent, with the median response being 47 percent. There is some diversity among Kansas banks, but the majority appear to be smaller banks emphasizing agricultural lending.

Of the six risks considered, credit risk was viewed as the most important. Credit risk was ranked as most important five years ago, three years ago, and today, and its relative

importance has increased in recent years. Cost of funds risk consistently ranked second, although its highest average ranking was three years ago. Regulatory risk grew in importance over time, particularly among agricultural bankers and bankers with over ten years of management experience. Liquidity risk consistently received an intermediate rank, and investment risk and solvency risk were typically considered as least important. The current farm recession received the highest rating today among all factors considered in explaining the rankings of the risks.

In the aggregate, bank performance as measured by CAMEL ratings has deteriorated in the last few years. The greatest deterioration has come in the last three years, with credit risk ranking as the primary cause of this deterioration. Asset quality has declined significantly for many banks, and earnings have suffered, as well. Poor credit conditions appear to have produced this result. Factors such as capital adequacy, management ability, and bank liquidity do not appear to be as important in contributing to this overall decline.

The dollar volume of loan losses was the highest-ranking measure for credit risk in every period; 90-day delinquencies consistently ranked second. The bankers viewed credit risk as the most difficult risk to measure. Measurement of risk changed most dramatically for cost of funds risk, as adoption of gap management increased over time. However, spreads are still the most favored measure of cost of funds risk. Regulatory risk was ranked as the second most difficult risk to measure, with its primary measure being the qualitative one of regulatory publica-

tions and contacts. Measurement of most risks has not changed substsntially over time, although some changes appear to have taken place where both the need and the opportunity to change have existed.

Certain trends are apparent in risk management. Ratings of nearly all risk responses indicate more intensive management efforts. Responses to cost of funds risk have changed dramatically over time, as the practices of gap management, variable rate loans, snd weekly deposit pricing have all become much more extensive. Other general risk responses such as reviews of bank goals and bank staffing needs have also become much more common. Responses to credit risk include increased use of annual reviews of lending policies, use of loan insurance, and loan pricing discrimination. Diversification of the loan portfolio has been limited.

Agricultural lending practices have changed during the last five years as credit conditions have deteriorated. One change has been the great increase in demand for financial information from agricultural borrowers; almost all banks now require a balance sheet, a cash flow statement, snd some statement of income and expense from their farm borrowers. Less money is being loaned todsy against a given amount of collateral for every type of agricultural loan, compared to lending practices of only three years ago. Use of Farmers Home Administration loan guarantees was limited, but two-thirds of the banks expected their use of guarantees to increase in the near future.

Five systems of classification were applied to the banks to determine how different types of banks have performed during this

period. The five classifications were type of clientele (agricultural or nonagricultural), size, region, management experience, and current CAMEL rating. Interesting differences were found among groups of banks in each system of classification.

Agricultural banks' performance today is typically poorer than that of nonagricultural banks. Agricultural banks were typically smaller and less able to diversify, as compared to nonagricultural banks. Risk measurement and management practices were not significantly different among the groups, although differences in performance clearly existed in both overall CAMEL ratings and CAMEL components. Significant differences were also found in the quality of agricultural loan portfolios today, with the agricultural banks having higher farm loan renewal rates. The performance of agricultural banks as a group has significantly deteriorated during this decade.

There were some notable differences accompanying differences in bank size. Significant differences in CAMEL ratings were detected three years ago, but it now appears that deteriorating performance is found among banks of all sizes. Smaller banks were much more likely to be agricultural banks, and the group of smallest banks typically showed the poorest performance. Differences in risk management were primarily in the area of cost of funds risk management, where larger banks place relatively more emphasis on gap management. Another important difference was found in the use of lending diversification: only the largest banks indicated more than just limited use.

Only slight differences in bank performance and operation

were found among banks in different regions of the state. The results paralleled those of earlier comparisons in that regions having typically smaller, more agriculturally-oriented banks showed somewhat poorer performance. No statistically significantly differences in risk measurement or management were found among the groups, although the regions where agricultural lending was most concentrated were slso the regions where lending diversification was most limited. However, performance was declining for banks in all regions.

Bank performance did not differ significantly as management experience varied. Although the group of bankers having the most experience often received the lowest CAMEL ratings, no statistically significant differences in bank performance appeared as management experience varied. Managers with the most experience saw regulatory risk as being much more important than did the rest of the managers. No outstanding differences in risk measurement were detected among the groups. Similarly, no significant differences were found in the ratings of selected risk management practices.

Banks with CAMEL rating of 1 tended to have less reliance on agricultural lending, relative to lower-rated banks. Few significant differences were found in preferences for individual measures of risk as CAMEL ratings varied. Lower-rated banks tended to show more clear preferences for particular measures withing each group of measurement tools, indicating that their risk measurement efforts may be focused too narrowly in certain cases. Ratings of selected risk responses did not provide clear indications of reasons for differing performance.

CONCLUSIONS

The goals of this study were to determine which risks hankers perceive as being most important to the success of their operations, to examine how hankers measure or monitor these risks, to determine how hankers respond to these risks, and to examine how all of these factors have changed over time.

Credit risk is perceived as the most important risk to Kansas hankers today. The reason for this seems clear: deteriorating credit conditions, particularly in agriculture, have reduced loan portfolio quality for many banks. This is a serious trend, considering that the majority of Kansas hanks are primarily agricultural lenders. Cost of funds risk was also perceived as important; the period of volatile interest rates in the early 1980's illustrated the hazards of exposure to this risk. In recent years regulatory risk has risen the most in importance, as deregulation and perceived regulatory inconsistency have appeared to have more significant effects on banks now than in the past. Still, credit risk must he considered the primary risk and it will remain so in the near future.

The only major change in risk measurement was seen in that for cost of funds risk, as gaps and spreads were ranked higher and higher over the five-year period. Direct measures of risk were consistently preferred to hroader, less direct measures of risk, presumahly hecause they have more relevant, direct results. Preferences for individual measures of risk did not differ significantly as hank performance varied, hut hanks with poorer performance appeared to focus their risk measurement efforts on fewer measures of risk.

Management of cost of funds risk saw adjustments as volatile interest rates created the incentive to change, and gaps, spreads, and variahle rate loans provided the opportunity to change. Responses to greater credit risk have included more frequent loan policy reviews, loan insurance, loan guarantees, and pricing according to riskiness of loans. One notable response to credit risk in agricultural lending has been greater financial informational demands from agricultural borrowers; also, security requirements for agricultural loans bave increased. Use of loan guarantees is expected to increase if agricultural credit conditions continue to deteriorate. Other management practices like reviews of bank goals and objectives and reviews of bank staffing needs are also becoming more frequent.

Bank performance in general bas deteriorated over the last five years, witb most changes coming in tbe last three years. The principal source of problems for most Kansas banks appears to be the poor agricultural credit conditions. The recent changes in certain areas of risk management also indicate that certain areas of risk management may have been inadequate in light of cbanging economic conditions. Some banks' opportunity to diversify tbeir lending is limited, restricting tbeir responses. Effects of credit problems are beginning to reacb even the largest Kansas hanks today, although these problems have not been nearly as damaging to their performance or threatening to their survival in comparison to tbe smaller banks.

The results of this study bave certain implications for bank

customers. For depositors, there appear to be no major changes. The current situation of reasonable price competition for deposits through a variety of accounts and services should continue. The trend toward more competitions through new accounts and services should continue to provide good investment opportunities and flexible financial services for depositors. The safety of these deposits should remain well-insured; even though bank failure has become more frequent in recent years, depositors remain well-protected through the insurance of all deposits up to 100 thousand dollars. safety of these deposits well-insured.

For borrowers, however, there may be some recognizable changes as banks exercise greater scrutiny in their lending. Loan portfolio quality has deteriorated for many hanks, and their tendency will likely be to avoid marginal loans which may previously have heen made. Agricultural borrowers now find greater demands for financial information from their bankers than ever before. Farmers may also be expected to provide a greater portion of the capital for their operations, as hank security requirements have become more conservative.

The study's results also have certain implications for the Kansas hanking industry. The results indicate that the industry is in a period of adjustment. Changing economic conditions, particularly agricultural credit conditions, have produced an environment where survival is less assured today than in the past. Deregulation has also spawned greater competition among banks in some areas, and competition with other firms offering certain financial services has also increased.

Responses to these changing conditions may vary among hanks.

Agricultural hanks with few other lending options are somewhat restricted in their responses to the farm credit prohlem; responses such as greater financial informational demand and collateral requirements, and loan guarantees are options which many hankers are using or are prepared to use. Still, less risky (and perhaps less profitahle) investment alternatives may necessarily he sought.

The very largest hanks will prohahly maintain their relatively stronger performance, although the data has shown that they are not immune from some of the prohlems hesetting some smaller hanks. Through their own lending, through competition with other hanks and intermediaries, and through correspondent relationships with trouhled hanks, these larger hanks may experience more risk exposure in their operations.

Thus, stressed conditions and the need for competent management are evident. As economic conditions and financial markets continue to change, competent risk management will be necessary for hankers to deal with risk and still maintain safe, profitable operations.

APPENDIX A

QUESTIONNAIRE:
KANSAS BANKERS' ANALYSIS OF RISK AND RISK RESPONSE

GENERAL INSTRUCTIONS

Please read each question carefully before answering. Some questionsrequire "rankings" and others only simple "ratings." Some oftbequestions examine bow conditions have changed overtimeand require knowledge and experience from tbree and five years ago. Answer for only those periods when you were in a decision-making position at a commercial bank. For the periods when you were not in that type of position, indicate "not applicable" ("NA"). There may be otber questions tbat don't apply to your bank. Indicate "NA" in those cases, also.

Where specific cbaracteristics (e.g., dollar amounts, ratios, percentages, etc.) are requested, please respond using information as of June 30, 1985.

A business reply envelope bas been provided to return the form. Your response by no later tban October 1,1985,will be greatly appreciated.

I. BANK CHARACTERISTICS

1. Total assets: $_____

2. Capital/asset ratio: _____%

3. Loan/deposit ratio: _____%

4. Rate of return on assets over tbe twelve montb period from July 1, 1984 to June 30, 1985: _____%

5. The bank is: (check)
   ____ a national bank
   ____ a state bank and a member of tbe Federal Reserve System
   ____ a state bank and not a member of tbe Federal Reserve System

6. Is tbe bank owned by a bank holding company? YES NO
If "YES," in how many banks does this holding company bave controlling interest? _____

Is the bank owned by a group (family, individual, etc.) whicb has controlling interest in more than one bank? YES NO
If "YES," bow many banks are controlled by this group? _____

7. County in which tbe bank is located: _____

8. How many years have you been a chief executive officer? _____

II. IDENTIFYING RISK

9. For purposes of this questionnaire, the following risk classifications will be used:
a) CREDIT RISK -- potential delinquency or default by borrowers;
b) INVESTMENT RISK -- capital losses on securities sold before maturity;
c) LIQUIDITY RISK -- volatile deposits and other demands for funds;
d) COST OF FUNDS RISK -- unanticipated changes in the cost of funds;
e) SOLVENCY RISK -- financial institution's high financial leverage;
f) REGULATORY RISK -- unanticipated changes in the regulatory environment.

Please rank these risks and other risks not mentioned according to their impact on your decision making. Rank these risks according to your perception of their impact 5 YRS AGO, 3 YRS AGO, TODAY, and what you expect two to three years in the FUTURE (in each time period, give the greatest risk a "1", the second greatest risk a "2", and so on).

	FUTURE	TODAY	3 YRS	5 YRS
Credit risk:	_____	_____	_____	_____
Investment risk:	_____	_____	_____	_____
Liquidity risk:	_____	_____	_____	_____
Cost of funds risk:	_____	_____	_____	_____
Solvency risk:	_____	_____	_____	_____
Regulatory risk:	_____	_____	_____	_____
Other (specify):_____	_____	_____	_____	_____
Other (specify):_____	_____	_____	_____	_____

10. Below is a list of factors which may help explain the relative importance you gave each risk in the rankings above; you should also list factors you feel are important which aren't mentioned here. How important were each of these factors for TODAY's rating? for the rating 3 YRS AGO? for 5 YRS AGO? Use these ratings to show the importance of each factor.

1) utmost importance; a critical factor
2) important, though not critical
3) some minor relevance; not very important

FACTORS	TODAY	3 YRS AGO	5 YRS AGO
State of farm economy	_____	_____	_____
State of general economy	_____	_____	_____
Volatility of interest rates	_____	_____	_____
Activity of competitors	_____	_____	_____
Deregulation of interest on deposits (phase-out of Regulation Q)	_____	_____	_____
Quality of officers and staff	_____	_____	_____
Changing banking structure laws	_____	_____	_____
Other (specify):_____	_____	_____	_____
Other (specify):_____	_____	_____	_____
Other (specify):_____	_____	_____	_____

11. Bank examiners generally evaluate a bank's general "healtb" by determining 1) capital adequacy, 2) asset quality, 3) management ability, 4) earnings record and potential, and 5) liquidity position. On a scale of 1 to 5 ("1" = excellent health, "5" = bank subject to closure), please rate the overall condition of your bank (circle).

TODAY	1	2	3	4	5
3 YRS AGO	1	2	3	4	5
5 YRS AGO	1	2	3	4	5

12. Of tbe risks listed on question 9, which one(s) resulted in any change in your most recent overall rating? Rank the risks most responsible for any change (let "1" be tbe risk most responsible for cbange, "2" tbe next most important, etc; use "NA" for risks not responsible for cbanges).

___ credit risk
___ investment risk
___ liquidity risk
___ cost of funds risk
___ solvency risk
___ regulatory risk
___ otber (as specified on #9): _____
___ otber (as specified on #9): _____

13. Please rate the "healtb" of each of the factors evaluated by examiners: (circle)

	TODAY	3 YRS AGO	5 YRS AGO
Capital adequacy	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Asset quality	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Management ability	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Earnings record	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5
Liquidity position	1 2 3 4 5	1 2 3 4 5	1 2 3 4 5

III. MEASURES OF RISK

14. For <u>each</u> type of risk, please <u>rank</u> the measures or indicators used to monitor tbe risk. Mention and rank any other indicators you use whicb are not given on the lists bere. (Let "1" be tbe most important measure of risk, "2" the second most important measure, and so on; use "NA" for measures you do not use.)

	TODAY	3 YRS AGO	5 YRS AGO
a) <u>Credit risk</u>:			
Loan losses: dollar volume	_____	_____	_____
Loan losses: % of loans	_____	_____	_____
Loan delinquencies: 30 days	_____	_____	_____
Loan delinquencies: 90 days	_____	_____	_____
Forecasts of business conditions for your borrowers	_____	_____	_____
Other (specify):_____	_____	_____	_____
Other (specify): _____	_____	_____	_____

(THIS QUESTION IS CONTINUED ON THE NEXT PAGE)

Measures of Risk (cont'd): for each type of risk, please rank the measures used to monitor the risk; use "NA" for measures not used.

	TODAY	3 YRS AGO	5 YRS AGO
b) Investment risk:			
Volatility of interest rates	_____	_____	_____
Ratings on securities held	_____	_____	_____
Maturities of securities held	_____	_____	_____
Marketahility of securities held	_____	_____	_____
Cash demand (e.g., loan and withdrawal demand, which could necessitate early sale of securities)	_____	_____	_____
Pledging requirements	_____	_____	_____
Other (specify): _____	_____	_____	_____
Other (specify): _____	_____	_____	_____

****

c) Liquidity risk:			
Ratio of short term assets to short term liabilities	_____	_____	_____
Loan/deposit ratio	_____	_____	_____
Ratio of time deposits to total deposits	_____	_____	_____
New loan demsnd	_____	_____	_____
Loan renewals	_____	_____	_____
Volatile deposits	_____	_____	_____
Withdrawal demand	_____	_____	_____
Other (specify): _____	_____	_____	_____
Other (specify): _____	_____	_____	_____

****

d) Cost of funds risk:			
Gaps (difference hetween interest-sensitive assets and interest-sensitve liahilities for a certain maturity length)	_____	_____	_____
Spreads (spread hetween cost of funds and earnings rate)	_____	_____	_____
Rates paid hy competition	_____	_____	_____
Ratio of time and savings deposits to total deposits	_____	_____	_____
Maturities of time deposits	_____	_____	_____
Projected chsnges in market interest rates	_____	_____	_____
Cost of operations	_____	_____	_____
Other (specify): _____	_____	_____	_____
Other (specify): _____	_____	_____	_____

(THIS QUESTION IS CONTINUED ON THE NEXT PAGE)

Measures of Risk (cont'd): for each type of risk, please rank the measures used to monitor the risk; use "NA" for measures not used.

	TODAY	3 YRS AGO	5 YRS AGO
e) Solvency risk:			
Loan losses	____	____	____
Loan delinquencies	____	____	____
Capital/asset ratio	____	____	____
General economic conditions (inasmuch as they affect portfolio values)	____	____	____
Other (specify): _____	____	____	____
Other (specify): _____	____	____	____

****

f) Regulatory risk:			
Regulators' publicstions and contacts	____	____	____
Industry publications snd contacts	____	____	____
Pending federal legislation	____	____	____
Pending state legislation	____	____	____
Other (specify): _____	____	____	____
Other (specify): _____	____	____	____

****

15. Even though several indicators for each risk may be used, detection of risk may still be unsatisfactory. Please rank the different types of risk according to the difficulty with which they are monitored. (Let "1" represent the risk most difficult to monitor, "2" the second most difficult, and so on.)

___ Credit risk
___ Investment risk
___ Liquidity risk
___ Cost of funds risk
___ Solvency risk
___ Regulatory risk
___ Other (as specified on #9) _____
___ Other (as specified on #9) _____

IV. RISK RESPONSES

16. Please rate each of tbese responses according to the degree of use in your institution. Use these ratings:

1) extensive use
2) limited use
3) not used

	TODAY	3 YRS AGO	5 YRS AGO
Participation loans witb correspondents	_____	_____	_____
Sales of loans to other banks controlled by your bank's owners	_____	_____	_____
Managing tbe percentages of the loan portfolio in each type of loan (i.e., agricultural, installment, commercial, etc.)	_____	_____	_____
Diversifying tbe loan portfolio geographically (lending outside your normal market area)	_____	_____	_____
Specifying percentages of tbe investment portfolio to be beld in certain types of securities	_____	_____	_____
Charging higher interest rates on riskier loans	_____	_____	_____
Use of loan insurance (e.g., crop, bail, and credit life insurance)	_____	_____	_____
Use of guarantee programs (e.g., SBA and FmHA programs)	_____	_____	_____
Using variable rate loans with fixed maturities and variable payment size	_____	_____	_____
Using variable rate loans with fixed payment size and variable maturities	_____	_____	_____
Matcbing maturities of assets and liabilities (gap management)	_____	_____	_____
Hedging cost of funds risk with financial futures	_____	_____	_____
Changing CD interest rates weekly in response to changes in national money market rates	_____	_____	_____
Adjusting service fees to match the costs of these services	_____	_____	_____
Use of incentive/premium programs to maintain and attract deposits	_____	_____	_____
Basing interest rate changes on rates charged or paid by competitors	_____	_____	_____
Limiting dividends to build capital	_____	_____	_____
Annual review of bank's investment and lending policies	_____	_____	_____
Annual review of staffing needs	_____	_____	_____
Annual review of bank's goals and objectives	_____	_____	_____
Participation in C.E.O. and officer training seminars and schools	_____	_____	_____
Increasing liability insurance on officers and members of Board of Directors	_____	_____	_____

(THIS QUESTION IS CONTINUED ON THE NEXT PAGE)

16. Risk Responses (cont'd): rate each of these responses according to tbeir degree of use.

	TODAY	3 YRS AGO	5 YRS AGO
Giving seminars for customers to improve tbeir creditwortbiness	_____	_____	_____
Providing financial planning services for customers	_____	_____	_____
Increasing the number of income centers in tbe bank (adding insurance, discount brokerage services, etc.)	_____	_____	_____

17. Concerning diversification, can your institution reach broader markets by:

a) making additional types of loans to diversify your loan portfolio? YES NO

b) attracting additional of types of depositors to diversify your liabilities? YES NO

Will tbe new multi-bank holding company laws change your institution's empbasis on geographic diversification? YES NO

18. An overline request is a loan request whicb seeks an amount in excess of tbe bank's legal lending limits, wbile a participation loan situation involves two or more institutions in tbe funding and servicing of that loan.

What percentage of the number of participation loans are overline loans at your bank? _____%

What percentage of tbe total dollar volume of participation loans are overline loans? _____%

19. For eacb time period, rank your bank's responses to overline requests, including responses not mentioned bere (with "1" being the most favored, "2" the next best response, etc.; use "NA" for any responses not used).

	TODAY	3 YRS AGO	5 YRS AGO
Participation with a regular correspondent	_____	_____	_____
Referral to another institution in area	_____	_____	_____
Referral to anotber bank closely held by tbe owner of your bsnk	_____	_____	_____
Participation witb another bank closely beld by tbe owner of your bank	_____	_____	_____
Denial of all overline requests	_____	_____	_____
Other (specify): _____	_____	_____	_____
Otber (specify): _____	_____	_____	_____

20. For wbat reasons do you make participation loans wbich are not overline requests? Rank these reasons according to their importance to you; also, list and rank any factors not mentioned on this list wbich you feel are important (Let "1" be the most important reason, "2" the next most important, and so on.).

___ To spread out or share credit risk with anotber institution
___ For income purposes in a holding company or "chain" banking setting
___ To improve or maintain the bank's liquidity situation
___ Otber (specify): _____
___ Otber (specify): _____
___ Not applicable -- we have no participation loans wbich are not overlines

21. What do you see as barriers to your usage of financial futures to bedge cost of funds risk? Rank these factors (and any others you feel are important) according to their impact on your decision to use futures, with "1" being tbe greatest barrier, "2" being tbe next greatest barrier, and so on.

___ Adverse accounting treatment of futures positions
___ Lack of qualified personnel to implement and manage a bedging program
___ Riskiness of financial futures trading
___ Presence of reasonably effective, more practical, and less costly risk management alternatives (e.g., matching maturities)
___ Resistance by regulators
___ Resistance by Board of Directors
___ Other (specify): _____

22. A measure called a "gap" is tbe difference between the bank's rate-sensitive assets and its rate-sensitive liabilities (RSA - RSL = GAP). When interest-sensitive assets are greater tban interest-sensitive liabilities, then tbe gap is said to be positive; wben tbe interest-sensitive liabilities are greater, the gap is said to be negative. Indicate whetber your gap is positive, negative, or not calculated (circle).

For a three montb horizon, your gap is:	+	-	not calculated
For a six month horizon, your gap is:	+	-	not calculated
For a twelve month borizon, your gap is:	+	-	not calculated

23. A measure called a "spread" is tbe difference between the weighted aversge return realized on interest-earning assets and tbe weighted average cost of funds. How does your spread today compare with what it was three and five years ago? State your answers in terms of percentage points.

Spread today _____
3 yrs ago _____
5 yrs ago _____
Not calculated _____

V. THE AGRICULTURAL LENDING FUNCTION AND RISK RESPONSES

24. What percentage of your loan portfolio is in agricultural loans?
_____%

25. What is the dollar volume of your agricultural loan portfolio?
$_____

26. How many officers at your bank have their primary responsibility in the agricultural lending function? _____

27. What percentage of the number of agricultural loan applications at your institution exceed your legal lending limits?

TODAY:	_____%
3 YRS AGO:	_____%
5 YRS AGO:	_____%

28. What types of financial statements do you require from your agricultural borrowers? Check the ones you require TODAY, and the ones you required 3 YRS AGO and 5 YRS AGO.

	TODAY	3 YRS AGO	5 YRS AGO
Balance sheet	____	____	____
Income statement	____	____	____
Cash flow statement	____	____	____
Schedule F	____	____	____
Other: _____	____	____	____
Other: _____	____	____	____

29. What are your general rules for security requirements (that is, the portion of the appraised value of an asset you loan) for these different types of loans? What were the security requirements 3 YRS AGO and 5 YRS AGO?

	TODAY	3 YRS AGO	5 YRS AGO
Farm real estate loans	____%	____%	____%
Farm machinery loans (new)	____%	____%	____%
Farm machinery loans (used)	____%	____%	____%
Crop operating loans	____%	____%	____%
Cow-calf operation loans	____%	____%	____%
Cattle and hog feeding loans (animals and feed)	____%	____%	____%
Cattle and hog feeding loans (animals only)	____%	____%	____%
Hog farrowing operation loans	____%	____%	____%

30. Do you accept a security interest beyond a first lien (that is, do you accept second mortgages) for agricultural loans?

YES NO

31. How have maturities changed over the last five years? For each type of loan, what were the average maturities? Write in the average maturity (e.g., six months, one year, five years, etc.) for each type of loan in each time period.

	TODAY	3 YRS AGO	5 YRS AGO
Farm real estate loans	_____	_____	_____
Livestock operating loans	_____	_____	_____
Crop operating loans	_____	_____	_____
Farm machinery loans	_____	_____	_____

32. How often do you change interest rates on variable rate loans?
___ When the bank's base/prime rate changes
___ Monthly
___ At time of loan maturity
___ Other (specify): _____

33. In terms of dollar volume, what percentage of agricultural loans wererenewed rather than repaid at the normal maturity date in these three respective periods?
THIS YEAR: _____%
3 YRS AGO: _____%
5 YRS AGO: _____%

34. In terms of dollar volume, what percentage of agricultural loans are cnrrently involved in the FmHA loan guarantee program?
_____%
Do you expect this percentage to increase in the near future?
YES NO
In terms of dollar volume, what percentage of agricultural loans are currently involved in the FmHA debt restructuring program?
_____%

35. Is your institution WILLING to sell farm loans in a secondary market?
YES NO
Is your institution ABLE to sell farm loans in a secondary market?
YES NO
If you answered either question "NO," check all factors that are responsible.
___ Lack of officer familiarity with secondary loan market
___ Lack of demand for farm loans in secondary market
___ Cannot arrive at mutually heneficial price with huyer
___ Excessive paperwork and other complications
___ Other: _____
___ Other: _____

THANK YOU VERY MUCH FOR YOUR COOPERATION IN COMPLETING THIS SURVEY.

IF YOU WOULD LIKE A SUMMARY OF THE SURVEY RESULTS, PLEASE ATTACH A BUSINESS CARD HERE. YOU WILL THEN RECEIVE A SUMMARY REPORT WHEN THE RESULTS ARE COMPILED.

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A SURVEY OF RISK MANAGEMENT IN KANSAS BANKS

By

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AN ABSTRACT OF A MASTER'S THESIS

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The business environment has changed noticeably for Kansas banks in the 1980's. Events such as farm recession, greater volatility of interest rates, and deregulation have produced a riskier banking environment. This study examined which risks bankers perceive as most important, why these perceptions are held, how hankers measure risk exposure, and how bankers respond to these risks.

Credit risk was perceived as the most important risk to Kansas bankers today. Deteriorating credit conditions, particularly in agriculture, have reduced loan portfolio quality for many banks. Cost of funds risk is also perceived as quite important. Regulatory risk has grown significantly in importance in the last few years. Bank performance as measured by overall CAMEL rating deteriorated from 1980 to 1985; this is an indication of the increasing riskiness of the banking environmment. Bankers identified credit risk as the most important source of changes in bank performance.

The most significant change in risk measurement in the five-year period was seen in cost of funds risk measurement, as spreads and gaps became more important. Banks with lower CAMEL ratings tended to have narrower preferences among measures of risk, indicating that risk measurement may he best accomplished through the use of multiple measures for each risk.

Management of cost of funds risk has seen increasing use of spreads, gaps, and variable rate loans. Responses to agricultural credit risk have included greater financial informational demand from horrowers and higher collateral or security requirements for agricultural loans. Practices such as reviews of

lending policies, staffing needs, snd bank goals and objectives have become more common.

Performance has differed among certain groups of banks. In general, agricultural banks were rated significantly below non-agricultural banks today on overall CAMEL ratings. The very largest Kansas banks have typically maintained stronger performsnce; however, they also sppear to have experienced more risk in their operations. Competent risk management may be necessary for all Kansas banks to deal with the more risky banking enviroment.