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# Asset/Liability Management in Kansas Banks

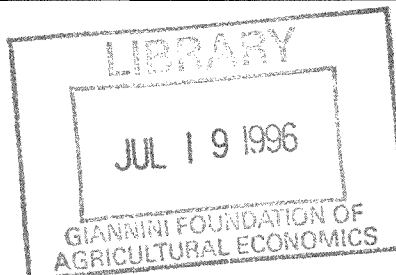
by Christine A. Cole,  
Allen M. Featherstone,  
and Martin L. Albright

**Research Report #20**

**Department of Agricultural Economics**

**Kansas State University**

RSUAE



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## ASSET/LIABILITY MANAGEMENT IN KANSAS BANKS

By

Christine A. Cole,

Allen M. Featherstone,

and

Martin L. Albright \*

May 25, 1996

\* The authors are graduate research assistant, associate professor, and extension assistant, Department of Agricultural Economics, Kansas State University. The authors would like to thank the Kansas Bankers' Association as well as the banks that participated in the survey for their assistance with this study. The authors would also like to thank Larry Langemeier and Michael Langemeier for their comments that greatly improved the final draft. This is Contribution No. 96-480-D from the Kansas Agricultural Experiment Station.

## **ASSET/LIABILITY MANAGEMENT IN KANSAS BANKS**

### **ABSTRACT**

A survey of 441 Kansas banks was used to examine the asset/liability management techniques used in Kansas commercial banks. The survey response rate was 26.5 percent. Results indicate that formal asset/liability management policies and asset/liability management committees exist in nearly all Kansas banks. Gap analysis, loan product pricing, and diversification are the major risk management techniques used in Kansas banks; secondary loan market sales and derivative products are seldom used. Specialized asset/liability management computer software is popular in Kansas banks. However, results suggest no clear consensus on the software used.

## TABLE OF CONTENTS

<b>LIST OF FIGURES</b> .....	ii
<b>LIST OF TABLES</b> .....	ii
<b>ASSET/LIABILITY MANAGEMENT THEORY</b> .....	1
<b>History of Asset/Liability Management</b> .....	1
<b>Financial Risks</b> .....	4
<b>Models and Techniques for Risk Measurement and Management</b> .....	4
<b>Gap Analysis</b> .....	5
<b>Duration Analysis</b> .....	6
<b>Simulation</b> .....	7
<b>Asset Liability Strategies</b> .....	8
<b>Financial Futures and Hedging</b> .....	8
<b>Futures Options and Hedging</b> .....	9
<b>Swaps</b> .....	10
<b>Other Risk Management Techniques</b> .....	10
<b>SURVEY DESIGN</b> .....	12
<b>EMPIRICAL SURVEY RESULTS</b> .....	13
<b>Overall Survey Response</b> .....	13
<b>Bank Characteristics</b> .....	13
<b>Identifying Risk</b> .....	14
<b>Risk Responses</b> .....	16
<b>The Agricultural Lending Function and Risk Responses</b> .....	17
<b>Asset/Liability Management</b> .....	18
<b>Summary</b> .....	21
<b>REFERENCES</b> .....	23

## LIST OF FIGURES

<b>Figure 1. Kansas Bankers' Association Regional Banking Districts</b> .....	<b>24</b>
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## LIST OF TABLES

<b>Table 1. Bank Characteristics: Summary Statistics for Responding Banks</b> .....	<b>25</b>
<b>Table 2. Identifying Risk: Frequency Distribution and Rankings of Mean Risk</b> .....	<b>26</b>
<b>Table 3. Identifying Risk: Frequency Distribution and Mean Ratings of Risk Factors</b> .....	<b>26</b>
<b>Table 4. Frequency Distribution and Mean Ratings of Strength of Bank Components</b> .....	<b>27</b>
<b>Table 5. Loan Participations as a Percent of Total Loan Volume</b> .....	<b>27</b>
<b>Table 6. Loan Participations as a Percent of Agricultural Loan Volume</b> .....	<b>27</b>
<b>Table 7. Loan Portfolio Outside the Geographical Market</b> .....	<b>28</b>
<b>Table 8. Intervals for Repricing Interest Rates on CD's</b> .....	<b>28</b>
<b>Table 9. Management of Gap Ratios and Interest Rate Spreads</b> .....	<b>29</b>
<b>Table 10. Volume Distribution of Agricultural Loans</b> .....	<b>30</b>
<b>Table 11. Financial Statements Required for Agricultural Loans</b> .....	<b>30</b>
<b>Table 12. Repricing Schedules for Variable-Rate Agricultural Loans</b> .....	<b>30</b>
<b>Table 13. Factors Contributing to Lack of Secondary Loan Market Use</b> .....	<b>31</b>
<b>Table 14. Components of Asset/Liability Management Policy</b> .....	<b>31</b>
<b>Table 15. Committee Meeting Schedules for Asset/Liability Management</b> .....	<b>31</b>
<b>Table 16. Committee Functions for Asset/Liability Management</b> .....	<b>32</b>
<b>Table 17. Average Percentage of Match-Funded Loan Volume by Loan Type</b> .....	<b>32</b>
<b>Table 18. Factors Used in Determining Tier Status in Differential Loan Pricing</b> .....	<b>32</b>
<b>Table 19. Total Loan Volume Distribution by Repricing Schedule</b> .....	<b>33</b>

**LIST OF TABLES (continued)**

<b>Table 20. Distribution of Loan Types by Repricing Schedule</b> .....	<b>33</b>
<b>Table 21. Techniques Used for Risk Measurement and Management</b> .....	<b>34</b>
<b>Table 22. Techniques Used for Liability Management</b> .....	<b>34</b>
<b>Table 23. Techniques Used for Asset Management</b> .....	<b>34</b>
<b>Table 24. Summary of Computer Software Use for Asset/Liability Management</b> .....	<b>35</b>
<b>Table 25. Computer Software for Asset Liability Management</b> .....	<b>36</b>
<b>Table 26. Computer Software for Asset/Liability Management by Total Assets and Bank Type</b>	<b>37</b>
<b>Table 27. Computer Software for Asset/Liability Management by Return on Assets, KBA District, and CEO Experience</b> .....	<b>37</b>
<b>Table 28. Specific Software for Asset/Liability Management by Return on Assets and CEO Experience</b> .....	<b>38</b>
<b>Table 29. Specific Software for Asset/Liability Management by Total Assets, KBA District, and Bank Type</b> .....	<b>39</b>



## **ASSET/LIABILITY MANAGEMENT THEORY**

The need for capital is at the core of all businesses, and the efficient and effective allocation of capital is one of the main functions carried out by financial intermediaries in our economy today. Financial markets, and thus financial intermediaries, are driven by the price system as the means for the efficient allocation of capital. Market-based economics dictates that the equilibrium price of an instrument is determined by the intersection of supply and demand. In financial markets, lenders charge a price for the funds that they provide, and borrowers pay a price for the funds that they acquire. Financial intermediaries provide various amounts of funds to borrowers based on the price they receive for such funds, and borrowers desire varying amounts of funds depending on the price charged for the funds. Thus, supply and demand for capital exist, and the intersection of the two determines the price of funds, or market interest rate.

The supply of and demand for funds are changing continuously, consequently causing interest rates to move, many times unexpectedly and unpredictably. The risk associated with changing interest rates is one of the major concerns of asset/liability management (ALM). Financial intermediaries seek to manage this risk, as well as other financial risks, through the use of effective ALM policies, procedures, and models.

### **History of Asset/Liability Management**

Asset/liability management is the act of planning, acquiring, and directing the flow of funds through a financial organization to generate adequate and stable earnings, maintain adequate liquidity, and steadily build capital, while taking reasonable and measured business risks. In short, ALM is the sum of the financial risk management of any financial institution. This includes setting policy, structuring of loan repricing and maturity schedules, undertaking financial hedge positions, budgeting capital, and measuring internal profitability. Asset/liability management also involves contingency planning and the analysis of the impacts of unexpected changes in interest rates, competition, and economic growth. Uyemura and Van Deventer state that ALM also is concerned with understanding how individual business decisions and aggregate portfolio composition affect a bank's overall risk profile and how the bank should adjust its performance.

Uyemura and Van Deventer also believe that the goal of ALM can be summed up as maximizing long-run, risk-adjusted returns to shareholders.

Although not defined as a discipline until the 1970s, ALM has existed in skeletal form since the dawn of the banking industry. Early regulatory restrictions made ALM a relatively rudimentary process. During these times, interest rates were unaffected by market pressures, and risks in the banking industry were relatively minor because of regulations mandating rates for deposits and limiting levels on loan pricing. However, the amendment and later demise of Regulation Q during the 1970s brought new importance to ALM.

With Regulation Q no longer in effect in the late 1970s and early 1980s, banks were able to compete freely for deposit dollars. Just as banks began to competitively set market interest rates, inflation in the U.S. economy accelerated, and the Federal Reserve tightened the money supply. Consequently, the cost of funds rose to record-high levels. Numerous bank failures occurred in this time period as a result of financial institutions funding long-term fixed-rate assets with short-term liabilities.

The mismatching of funds and the consequential bank failures during that time brought to light interest-rate risk exposure and the importance of interest risk management. Many financial intermediaries were accustomed to funding loans with liabilities of a different temporal nature, thus creating mismatched funding. Many were funding long-term fixed-rate loans with short-term liabilities. This presented no problem for intermediaries while interest rates were regulated and fairly stable. However, in unregulated conditions, a rise in interest rates forced intermediaries to reprice expiring liabilities at a higher cost while, long-term fixed-rate assets remained priced at a lower interest rate. Profit margins were squeezed, many becoming negative. The sharp movement of interest rates during this newly unregulated period illustrated the consequences of poor interest-rate risk management on the part of banks. The previous existence of stricter regulatory requirements had not required developing a discipline in interest-rate risk management. However, most banks now realized that an active ALM system addressing interest-rate risk was crucial to

their continued existence.

Since the early 1980s, ALM in financial institutions has grown very rapidly. It began as a simple gap model that analyzed risk in terms of the gaps or mismatches in cash inflows and outflows. Duration gap models were the next tools to be developed. These models analyzed the quality of cash flows instead of the actual cash flows. The complexity and effectiveness of both gap and duration models continue to increase. Recent ALM developments include the use of hedging instruments and derivative products, primarily because of growth in the capital markets. Simulation models, which combine data concerning future events with data on current positions to simulate earnings and capital under different interest rate scenarios, also are being applied widely. The use of swaps also is rising in popularity.

Current banking regulations illustrate the concern of regulators that ALM issues be addressed by financial institutions and that adequate planning and precautionary measures be implemented. Regulations require that financial institutions have a detailed interest-rate risk management policy that states their maximum interest-rate risk exposure. Financial institutions must have a formal management process, which usually is supervised by an ALM committee. Regulations further require financial institutions to use a system to identify and measure the impact of various forms of interest rate risk on the institution's net value and earnings (Bitner and Goddard; Fabozzi and Konishi).

The actual ALM process employed in financial intermediaries varies among institutions; however, the theory behind the procedures and the fundamental concepts coincide. Effective ALM includes planning, setting objectives, making and implementing policy, and continued analyzing and monitoring. The ALM process also should include the establishment of a formalized decision-making body, commonly referred to as the ALM committee, to oversee the entire process.

Effective planning is the first step in designing a high quality ALM system. Thorough planning allows banks to design business strategies and objectives that are mutually attainable. Planning also enables financial managers to attain a comprehensive understanding of the factors contributing to risk exposure.

Planning will allow financial intermediaries to identify relevant risks, factors causing risks, expected impacts of risks, and methods to effectively manage these risks.

### **Financial Risks**

Risk is a widely used and ambiguously defined term. Uyemura and Van Deventer define risk as the volatility (standard deviation) of net cash flows of a business unit, whereas Barry et al. define risk as potential adversity, often expressed by unanticipated variation. Regardless of the definition, financial risk management is a key component of ALM. Financial institutions must be able to identify and understand risks embedded in their balance sheets to successfully manage such risks and perform adequate ALM.

Uyemura and Van Deventer define six categories of risk that financial institutions face: credit risk, interest rate risk, foreign exchange risk, liquidity risk, operating risk, and capital risk. Credit risk is the possibility that more customers than expected default on their loans. Interest rate risk is the major focus of ALM and involves changes in market interest rates, which create the potential for reduced earnings, capital, and market value of equity. Foreign exchange risk occurs because of increased globalization; some financial institutions now have multiple currency exposures. Liquidity risk is the risk that an institution will not have sufficient cash for its normal operating requirements or that the need for liquid assets will be greater than expected. Operating risk is the risk of loss or unexpected expenses associated with fraud, check kiting, litigation, environmental liabilities, or other such situations. Capital risk is the possibility that capital is allocated improperly, which results in misleading signals, poor pricing, and bad strategic decisions.

### **Models and Techniques for Risk Measurement and Management**

Accurate risk assessment, especially interest-rate risk measurement, is one of the most critical requirements for effective ALM in financial institutions. Because interest rates and interest rate risk are the links that tie assets with liabilities, financial institutions must continually monitor and manage interest-rate risk exposure. The margin of difference between the interest earnings on assets and the interest costs of liabilities is one of the biggest concerns related to interest rate risk for financial institutions. This spread,

commonly referred to as the net interest margin, is a primary focus for managing interest rate risk.

Several ALM models and techniques exist for interest-rate risk measurement and management. However, no single technique is best for all banks. The most appropriate model may depend on the individual institution's overall size and the complexity of its interest-rate risk exposure. A bank should employ those techniques or models that best capture its significant sources of interest rate risk.

### **Gap Analysis**

Gap analysis is one method used by financial intermediaries to measure interest rate risk or the instability of net interest margins. Gap analysis measures the difference in timing of the repricing of assets and liabilities within a specified period. The gapping period is a short-term planning horizon that examines the time balance between the assets and liabilities being repriced. Because the gapping period typically depends on the interest rate sensitivity of funding sources for an institution, its length may be different for all financial institutions.

Gap analysis focuses on the examination of rate-sensitive assets and rate-sensitive liabilities. Rate-sensitive assets and liabilities are those that either mature or can be repriced during the gapping period. Gap analysis centers on the repricing date rather than the maturity date of the assets and liabilities. Gap may be measured in dollar values using the following equation:

$$Gap = RSA - RSL \tag{2.1}$$

where RSA is the dollar value of rate-sensitive assets and RSL is the dollar value of rate-sensitive liabilities.

Gap also may be measured in relative terms using the following ratio:

$$Gap \text{ ratio} = \frac{RSA}{RSL} \tag{2.2}$$

Use of the gap ratio allows comparisons among financial institutions of various sizes.

Whenever the gap ratio equals 1.0 and the dollar value gap equals zero, the volatility of the financial

institution's earnings is minimized and its net interest margin theoretically is protected from interest rate risk. A gap ratio greater than 1.0 indicates a positive dollar-value gap. In this situation, if interest rates rise, the return on assets will rise faster than the cost of funds, resulting in a larger net-interest margin and higher income. A gap ratio of less than 1.0 occurs whenever a negative dollar-value gap exists. If interest rates fall during this time, the cost of funds will fall faster than the return on assets, also resulting in a larger net-interest margin (Barry et al.; Fabozzi and Konishi; Johnson; Uyemura and Van Deventer).

**Duration Analysis**

Duration gap is another method used in ALM to control interest rate risk and volatility in net interest income. It is more sophisticated than traditional gap analysis insofar as it takes into consideration both the timing and the market value of cash flows rather than merely the timing to maturity. Financial institutions employ duration analysis to determine the impact of interest rate changes on the market value of assets, liabilities, and equity, all which consequently affect the institution's net interest income. The goal in using duration is to immunize the net worth of the institution's market value against changes in market interest rates.

Simply stated, duration is the present value of the weighted average maturity of cash flows, where the weights used are the relative present values of each cash flow. Following the notation used by Barry et al., the duration of a financial instrument is calculated using the following equation:

$$D = \frac{\sum_{n=0}^N \frac{nP_n}{(1+i)^n}}{\sum_{n=0}^N \frac{P_n}{(1+i)^n}} \tag{2.3}$$

where  $n$  is the time period;  $P_n$  is the cash flow; and  $i$  is the market interest rate. The formula illustrates that duration is a measure of time weighted by the present value of cash flows.

Duration also may be thought of as a method to measure the price sensitivity or price elasticity of

a financial instrument to a change in the market interest rate. This interest rate elasticity is the percentage change in the market value of an asset or liability for a 1 percent change in interest rates. Interest rate elasticity is a good measure to determine the total effect of an interest rate change on the present value of future cash flows. The interest rate elasticity of a security is calculated as follows:

$$IRE = - \frac{D}{1+r} \quad (2.4)$$

where IRE is the interest rate elasticity; D is the duration of the security; and r is the yield to maturity of the security.

The goal of banks in using duration and interest rate elasticity is to stabilize the net worth of the institution by protecting it from interest rate changes. When a security has a positive duration, any increase in interest rates will decrease the value of the institution's equity. Alternatively, decreases in interest rates will increase the market value of equity. This value becomes more sensitive to interest rate changes as the value of duration moves farther away from zero, becoming either more positive or more negative.

Duration is a successful stabilization technique when portfolios of assets and liabilities have equal durations because their sensitivity to interest rate changes will be similar. Matched durations work to stabilize net worth, because bank capital is less exposed to interest-rate risk. However, if interest rate changes for asset portfolios do not match those for liability portfolios, bank capital is not protected completely from interest rate risk and is subject to fluctuations in value even with matched durations (Barry et al.; Fabozzi and Konishi; Johnson; Uyemura and Van Deventer).

### **Simulation**

Simulation is a proforma analysis that uses current balance sheet data and projected future data to simulate earnings, net interest income, capital, and market value of equity under various changing interest rate scenarios. Simulation allows financial institutions to examine the effects interest rates have on financial instruments. Some simulation models also have the capacity to predict future gap and duration measures

under various interest-rate scenarios.

Simulation is a dynamic method, whereas gap and duration analyses are static. In addition to predicting various financial instruments, simulation also may be used for testing different business plans for strategic planning and structuring off-balance sheet transactions. Simulation is a useful technique for determining the effect of prepayment on earnings under various funding strategies.

Although a useful tool, simulation can be complicated by the large amount of required data. Essential data include types of financial instruments, current outstanding balance, remaining contractual maturity, remaining amortization, payment frequency, repricing frequency, repricing index, repricing margin, periodic cap, lifetime cap, and lifetime floor. Additionally, analysts must make assumptions about future interest-rate scenarios; yield curves; repricing rates; spreads; and future balance sheet data, including the types and maturities of assets and liabilities. All assumptions must be as realistic as possible to ensure accuracy in model results.

### **Asset Liability Strategies**

A recent development in ALM is the use of derivative products, which has become popular with some financial institutions. Derivative products, also known as off-balance sheet instruments or synthetic instruments, are securities whose value depends on the values of other securities.

Derivative securities offer financial institutions a method of lowering funding costs and managing interest rate risk. Derivatives can be used to separate risks that normally are found together in a financial instrument, so that each risk can be priced independently. Derivatives also may be used for purposes of short-term cash management and liquidity management. One of the most popular uses of derivatives is issuing structured notes to lower funding costs. The three most common derivative products are financial futures, futures options, and swaps (Irwin; Johnson).

### **Financial Futures and Hedging**

Hedging with financial futures is one method by which financial intermediaries protect the market



value of assets, liabilities, and equity from the adverse affects of interest rate changes. Financial futures are contracts between two parties to buy or sell a financial instrument at a specified future date for a specified price. The hedge involves taking opposite positions in the cash and futures markets, so that any losses occurred in the cash market of the asset or liability will be offset by gains in the futures market, or vice versa.

Financial institutions may choose between two different hedges: a macro hedge or a micro hedge. Macro hedges are used when a financial institution wishes to hedge the net duration gap. They are used most commonly to protect the net worth of the institution or to achieve a specific asset/liability position. Micro hedges are used to protect the institution from unexpected changes in liability costs or asset returns of individual securities. They separate out the components of the balance sheet and attempt to control the risk associated with each financial instrument individually, instead of controlling the entire risk of the balance sheet as a whole.

It is important that financial institutions determine the proper financial futures instrument with which to hedge. The most effective method for selecting futures is to examine the characteristics of the cash instrument to be hedged and then select the financial future that is correlated most closely with the price changes of the cash security. The theory behind hedging is that, if the cash market asset is similar to the futures market asset, then profits in one market will be nearly identical to losses in the other market. However, if the assets do not match well, then the financial institution can incur basis risk. Institutions are subject to basis risk when changes in cash market prices do not exactly coincide with the changes in futures market prices. Treasury bonds and treasury bills are the most commonly traded of all financial futures (Fabozzi and Konishi).

### **Futures Options and Hedging**

Futures options are other derivative products that financial institutions can use to reduce interest-rate risk exposure and to improve profits in ALM. Unlike a futures contract, the buyer of a futures option has no obligation for further action. A futures option gives a financial institution the right, but not the

obligation, to buy or sell a specified financial instrument at a specified price during a given time period. The purchase of a call option allows a bank to buy a futures contract at a later time. Call options generally are used to increase profits if the financial market rallies. A put option allows for the sale of a futures contract at a later time. Put options are used as insurance against price declines.

Futures options can have caps, collars, or floors incorporated into them. A cap is used to set a maximum interest rate that can be charged on a floating-rate instrument. A floor is used to place a minimum interest rate on a floating-rate instrument; and a collar is the combination of a cap and a floor. These instruments generally are used to limit a financial institution's exposure to interest rate fluctuations in floating-rate lending and debt instruments. They also are used as insurance against vast interest rate movements (Fabozzi and Konishi; Johnson).

### **Swaps**

Swaps are more recent developments in interest-rate risk management. In short, a swap is a contractual agreement between a financial institution and a counter party to exchange the right to future cash flows or the obligation to pay future cash flows. Parties involved in the use of swaps agree on the cash flows to be exchanged; the time period for which exchanges will occur; the payment frequency; and a notational principal, or the amount of liability for which interest rates will be swapped. No principal is exchanged in swap agreements.

The most commonly used swap is the interest rate or coupon swap, in which parties agree to exchange interest payments on liabilities. Coupon swaps generally are used to exchange fixed rate cash flows for variable rate cash flows. Such exchanges help financial institutions reduce interest rate sensitivity and asset/liability mismatches.

### **Other Risk Management Techniques**

Several other risk management techniques similar to those employed by general businesses are available for use by banks. Barry et al. note that such techniques include diversification, liquidity

management, loan participations, and loan pricing.

Diversification can be employed in numerous manners. A financial institution may wish to diversify its loan portfolio by offering different types of loans, such as agricultural, agricultural real estate, commercial and industrial, nonagricultural real estate, consumer, and others. Institutions can further diversify among customers in terms of size and enterprise within a given loan category. Another way that institutions can diversify is by offering services and loans in different geographic areas. This serves to broaden the institution's market and reduce risk.

Liquidity management is another risk management technique. This involves controlling both primary and secondary financial reserves. Primary reserves are used for daily transactions and to meet fluctuations in cash demand. These reserves include cash, deposits at other financial institutions, and other highly liquid financial assets. Secondary reserves are used to meet longer-term liquidity requirements, usually those occurring within a year. These reserves include government securities, agency bonds, and other financial assets that have well-developed secondary markets.

Many financial institutions also employ loan participations as a means to manage risk. A participation is an agreement between two or more financial institutions to share a loan. Such an agreement allows an institution to reduce the risk associated with the particular loan and to manage interest rate risk. Many small financial institutions use participations as a means to finance large borrowers. Participations allow banks to provide loans that are desirable to borrowers, but that the bank does not wish to wholly retain because of risk exposure objectives.

Loan pricing may be the most important alternative risk-management method used by financial institutions. Institutions normally set prices to cover the total cost of lending, to protect against losses, and to allow for growth of the institution. Loan pricing is impacted by such factors as loan demand, lending risks, lending competition, resource costs, sources of funds, and lending efficiency.

Many financial institutions employ a differential or tier-based pricing system. Such pricing allows

an institution to tailor loans and prices to borrowers more easily. A tier-based pricing system can be differentiated by several risk factors. These include loan classification or performance status; geographic area; and loan characteristics, which include enterprise, size, servicing costs, or credit factors.

## **SURVEY DESIGN**

Asset/liability management is a bank-specific control mechanism. Several banks may employ similar ALM techniques, or each bank may use a unique system. A survey of all Kansas banks was used to investigate the various techniques utilized. This section discusses the survey data collection methods, the survey design including the areas of examination and type of questions asked, and the process followed for implementing the survey.

A survey was used for collecting the desired data, because it offered the ability to reach a large number of banks in a minimum amount of time. Reaching a large number of banks offered the possibility of a greater response rate. Problems with incomplete and incorrect answers and the lack of opportunity for follow up questions were disadvantages of the survey.

The survey sample consisted of 441 Kansas banks. All banks could be categorized as either agricultural or nonagricultural banks, so the practices and answers of the two could be compared. This broad survey also allowed the study to capture the existing diversity in Kansas banks. The survey was conducted during the fall of 1995. Specifically, the survey document was mailed to the CEO of each bank.

The questionnaire consisted of five areas: bank characteristics, identifying risk, risk responses, the agricultural lending function and risk responses, and ALM. The bank characteristics section focused on such factors as: bank size, location, ownership, and charter. Such components are useful for classifying and comparing banks. The identifying risk section asked questions dealing with bankers' perceptions of risk factors and their importance as risks. The section of risk responses was concerned with various risk management tools and their use, whereas the agricultural lending and risk response section focused on risk management tools used in agricultural lending. The latter section also examined risks in the agricultural loan

portfolio and the overall importance of agricultural lending to the bank. The ALM section asked questions about the use of specific ALM techniques and models employed by the bank.

## **EMPIRICAL SURVEY RESULTS**

This chapter presents the results of a survey of Kansas' bankers analysis of risk and ALM. The survey response rate and aggregate bank results are discussed.

### **Overall Survey Response**

The final survey response rate was 26.5%. One-hundred seventeen usable responses were received from the 441 questionnaires mailed on September 13, 1995. A follow-up letter was mailed on October 12, 1995 to all nonrespondent banks reminding them to return the questionnaire and extending the response deadline from October 13, 1995 to October 23, 1995. Eighteen additional questionnaires were returned during the extended response period.

Survey response might have been greater had the questionnaire been shorter in length. Several bankers commented that the survey became too long and time-consuming. Additionally, not all bankers completed every question, thus leaving missing data on several questions. Several bankers commented that they were unsure what was being asked by some questions or that they did not have the data readily available to answer some questions. The results note any possible problems with responses to any questions.

### **Bank Characteristics**

The 72 counties represented by the 117 responding banks were dispersed evenly across the state, as shown in Figure 1, where the responding banks are broken down according to the Kansas Banker's Association (KBA) Banking Districts. Total assets for the 117 responding banks averaged \$46.9 million and ranged from \$3.9 million to \$225.9 million; the standard deviation was \$40.0 million (Table 1). Twenty-eight percent of the banks had total assets of \$20 million or less; 55.6% had total assets between \$20 million and \$80 million; and 16.2% had total assets of greater than \$80 million. The mean capital/assets ratio was 10.6%. A breakdown indicates that 22.4% of the 116 banks responding to this question had a ratio of 8%

or less; 53.4% had a ratio between 8% and 12%; 18.1% had ratios between 12% and 16%; and 6% had ratios greater than 16%. The mean loan/deposit ratio was 61.74% and ranged from 18.0% to 99.8%. Results show that 8.6% of banks had ratios of 40% or less; 34.5% had ratios between 40% and 60%; 46.6% had ratios between 60% and 80%; and 10.3% had ratios greater than 80%. The mean return on assets was 1.4% but ranged from 0.26% to 14.5%. Nearly 43% of responding banks had a return on assets of 1.0% or less, and 87.5% of the banks had a return of 1.5% or less.

State chartered banks outnumbered national banks by nearly two-to-one. Fifty-one banks had more than one banking location, whereas 64 banks had only one location. Ninety-three banks were owned by holding companies. Seventy-six holding companies each owned only one bank; 8 each owned 2 banks; and 9 holding companies each owned more than two banks. Twenty-five banks were owned by a family or group of individuals that controlled more than one bank, with each group controlling an average of 4 banks. Nine groups each controlled 2 banks; 4 groups each controlled 3 banks; 4 groups each controlled 4 banks; 2 groups each controlled 5 banks; 4 groups each controlled 6 banks; 1 group controlled 7 banks; and 1 group controlled 25 banks. The mean number of years of experience for a chief executive officer was 11. Thirty-three of the respondents had 5 or fewer years of experience, whereas another 38 respondents had 6 to 10 years of experience.

### **Identifying Risk**

Credit risk was perceived as the most important financial risk, receiving a mean ranking of 1.51 (Table 2). For survey purposes, credit risk was defined as potential delinquency or default by borrowers. Seventy-seven of the 108 responding banks ranked credit risk as having the greatest impact on bank decision-making. Cost of funds risk was considered the second most important financial risk, with a mean ranking of 2.94. This risk was defined as unanticipated changes in the cost of funds. Although the differences were not large, regulatory risk, liquidity risk, and investment risk ranked third, fourth, and fifth, with mean rankings of 3.57, 3.71, and 3.90, respectively. Regulatory risk results from unanticipated changes in the

regulatory environment; liquidity risk results from volatile deposits and other demands for funds; and investment risk results from capital losses on securities sold before maturity. Solvency risk was considered the least important of the six financial risks. It was defined as a financial institution's high financial leverage. Seventy banks ranked solvency risk last, giving it a mean ranking of 5.59. In addition, bankers also listed competition and technology as other important financial risks.

As illustrated by Table 3, banks considered the state of the farm economy and the quality of personnel to be the most important risk factors. These factors were most important for roughly 63% and 68% of responding banks, respectively. Volatile interest rates, the state of the general economy, the changing structure of banking laws, and the activities of competitors were considered relatively less important to risk position of the banks. The greatest percentage of respondents classified these elements as important, though not critical, factors. Interest rate deregulation was rated lowest, though on average it was still considered important. Forty-eight respondents considered interest rate deregulation important, though not critical, whereas another 48 considered it of only minor relevance, and 15 respondents considered it a critical factor. Banks also listed government regulation, competition, technological advances, and cultural changes as other important factors contributing to banking risk.

The average overall health of responding banks was estimated to be 1.34, with 1.0 being excellent health and 5.0 classified as a bank subject to closure. Seventy-two responding banks considered themselves to be in excellent health, whereas the other 37 banks considered themselves to be in very good health. No banks reported a rating higher than 2.0.

Components of the CAMEL (Capital Asset Management Earnings Liquidity) rating were considered individually on the basis of their relative strength within Kansas banks. Results indicate that Kansas banks tend to consider management ability and capital adequacy their strongest components on average. Asset quality and earnings record were given poorer ratings, and bank liquidity overall was considered to be the weakest of the five components (Table 4).

## Risk Responses

Banks' responses to risk focused on loan participations, diversification, interest rate changes, and gap analysis. Seventy-four out of 112 responding banks indicated using loan participations for risk management. However, only 25 of these banks had participations exceeding 5.0% of their total loan volumes. Loan participations averaged 3.99% of total loan volumes (Table 5). Forty-five banks had participations in a portion of their agricultural loans. Participations of 30 of these banks averaged 5.0% or less of their agricultural loan volume. Agricultural loan participations averaged 3.64% of total agricultural volume (Table 6).

Diversification is another fundamental risk management technique. Nearly 60.2% of banks indicated that they could further diversify and reach broader markets by providing additional types of loans, whereas 55.9% of banks said that they could attract additional types of depositors to further diversify liabilities. Many banks diversify by seeking loans outside their normal geographical market. Survey results indicated this to be a prominent practice in Kansas banks; 85.5% of banks possessed some loans outside their geographical market. Loans outside the normal market area averaged 7.39% of total loan volume. The loan distribution consisted of 50 banks with 5% or less of loans outside their normal market; 23 banks with between 5% and 10%; 6 banks with 10-15%; 8 banks with 15-20%; and 7 banks with greater than 20% of loans outside their normal geographical market (Table 7).

Banks indicated several intervals for repricing interest rates on certificates of deposit (CD's). The most common response was weekly changes (Table 8). Twenty-three banks responded that they change their rates when competitors' rates change, possibly indicating the existence of price leaders in the Kansas banking industry.

Eighty-two banks responded that they calculated 3-month gaps; 69 banks calculated 6-month gaps; and 89 banks calculated 12-month gaps (Table 9). Among those banks that calculated gaps, 82.9% of the 3-month gaps were positive; 82.6% of the 6-month gaps were positive; and 86.5% of the 12-month gaps were



positive. Thus, most Kansas banks are protected from interest rate increases. The largest percentage of gap ratios fell between zero and 1.0 for all gap horizons. The average interest rate spread for responding banks was 4.10% (Table 9). Over 85% of banks had spreads between 4 and 5%.

### **The Agricultural Lending Function and Risk Responses**

Much of the Kansas economy revolves around the agricultural industry. However, agriculture is an unpredictable and notably risky business. Managing and responding to risk associated with agricultural lending is extremely important to most Kansas banks. Of the banks that responded to the survey, 94.5% held agricultural loans. Total agricultural loan volume averaged 43.3% of the total loan-portfolio dollar volume for the 103 banks with agricultural loans. Agricultural real estate loans averaged 14.2% of total loan volume, whereas other agricultural loans averaged 29.1% of total loan volume for these 103 banks. The average agricultural loan portfolio was \$10.1 million, but portfolios ranged from \$150,000 to \$65 million. Over 50% of agricultural loan portfolios fell within the range of \$1.0 million to \$10 million (Table 10).

The average number of agricultural lending officers was 2.1, with sixteen banks having four or more. An average of 3.2% of all agricultural loan applications exceeded bank legal lending limits. Eighty-six banks indicated that agricultural loan applications exceeded legal lending limits 1% or less of the time. Only 15 banks had applications exceeding legal lending limits greater than 5% of the time. The Federal Reserve recognizes an agricultural bank to be a bank that holds at least 25% of its loan portfolio in agricultural loans. Seventy-five of the 103 banks holding agricultural loans meet that definition. An additional six banks fall very close to this classification, with each holding at least 20% of their loan portfolios in agricultural loans.

Table 11 presents the financial statements required by Kansas banks as part of the agricultural loan application process. Over 98% of banks required a balance sheet, whereas over 86 and 85% of banks required income statements and cash flow statements, respectively. Greater than 90% of banks required either entire tax returns or Schedule F's, many for several consecutive years. Additional requirements mentioned by responding banks included asset schedules, debt analysis sheets, farm plans, cash flow

projections, additional financial projections, and livestock and equipment inspections.

Bankers indicated several intervals for repricing interest rates on variable-rate agricultural loans. Table 12 shows the most commonly used intervals and the number of banks using each interval. The most widely used interval was when the bank's base/prime rate changed.

Use of the secondary market for the sale of agricultural loans was very low in Kansas banks. Of the six banks indicating use of the secondary market for the sale of agricultural loans, three banks sold three or fewer loans; one bank sold 15 loans; and two banks did not indicate the number of loan sales. Table 13 shows the reasons given by bankers for the lack of secondary market use. The most frequent responses were a lack of demand for farm loans in the secondary market, the desire or need to retain loans at the bank, and excessive paperwork and other complications associated with the secondary market. A lack of familiarity with the secondary loan market was another reason commonly cited for not using the secondary loan market. Reasons noted less frequently by bankers included the desire to serve the customer, no desire to use the secondary market, and no necessity to use the secondary market.

### **Asset/Liability Management**

The importance of ALM was readily apparent in Kansas banks; only six banks reported having no formal ALM policy. Policies most frequently contained provisions for formal objectives, limits on interest rate risk exposure, and philosophies. Over 73% of banks had policies containing strategies and delegations of authority. Nearly two-thirds of all banks also had reporting and decision making processes as sections of their ALM policies (Table 14). Asset/liability management committees existed in 103 responding banks, and most met on a monthly basis. Quarterly and weekly meetings were the next most common time intervals (Table 15). Table 16 presents the major functions of ALM committees in Kansas banks. Committees were responsible for loan pricing, funding, interest-rate risk measurement and management, competition assessments, and liquidity requirement management in nearly two-thirds of responding banks. Additional functions listed by bankers included managing spreads, earnings and capital, reviewing strategies and

performance, supervising management, and controlling and reviewing security transactions and portfolios.

Thirty percent of banks said they employed the practice of mismatching funds (e.g. funding long-term fixed rate loans with short-term liabilities); 70% of banks did not mismatch funds (e.g. fund long-term fixed rate loans with long-term liabilities or fund short-term loans with short-term liabilities). By process of elimination, banks not mismatching funds should be matching funds; however, survey results did not show this. The questions relating to this issue may have been located too close to each other in the survey, causing bankers to misread them. These questions were to have been used to determine the degree of interest-rate risk exposure by banks. The average total loan portfolio was 35% match funded. Table 17 presents the average match-funded percentages of various loan types. Percentages range between 33 and 39 for the five listed loan types. The majority of responding banks reported bimodal match-funded percentages of 0 to 5 and then of greater than 75.

The maximum interest-rate risk exposure averaged 387 basis points or 3.87%. Response was lower to this question than to most others (only 42 responding banks), because many bankers noted that they were unsure about what exactly the question was asking.

Fifty-four banks used differential or tier-based loan-pricing systems, whereas 56 banks reported that they did not use such systems. Of the 54 banks using differential pricing, over 85% used chattel margin, owner's equity, and repayment capacity as factors for determining tier status (Table 18). Other factors mentioned by bankers but not listed in the table included collateral type, deposit balances/liquidity, and management and history of the borrower.

Bank loans generally fall into three categories: variable rate loans, adjustable rate loans, and fixed rate loans. Average total loans for responding banks were 29% variable rate, 14% adjustable rate, and 57% fixed rate. A distribution of these loans by percentage is found in Table 19. The largest number of banks reported bimodal variable-rate loan portfolio values of 0 to 5% and greater than 25%; adjustable rate loans making up 5% or less of the loan portfolio; and fixed rate loans as greater than 50% of their total loan

portfolios. A distribution of five common loan types by repricing schedule and the number of banks in each category is listed in Table 20. The average percentages of variable, adjustable, and fixed rate loans for each of these loan types also are shown. Because these questions were more involved and required a greater amount of time to answer, many respondents left them unanswered.

Various techniques exist for risk measurement and management in commercial banks. Results indicate that the most common technique in Kansas banks is gap analysis. It was employed in over twice as many banks as the next closest technique, duration analysis. Simulation models were used in only 24.1% of banks, and derivative products were practically unused in Kansas banks (Table 21).

Techniques used for liability management included match-funded lending programs, callable bonds, floating rate bonds, and debt buybacks. These techniques were used in less than 42% of Kansas banks. Match funding was the most commonly used technique; however only 48 Kansas banks indicated its use (Table 22).

Strict asset-management techniques received relatively greater use in Kansas banks (Table 23). Loan product pricing was used in 104 of 116 banks, whereas investments were used in 101 banks. The least used asset-management technique, loan sales and participations, was reported by nearly 44% of banks.

Although increasing in popularity on a national basis, off-balance sheet products were almost never used in Kansas banks. Off-balance sheet products, also referred to as derivative products, include swaps, financial futures, option contracts, forward rate agreements, and swaptions. Only one of 116 responding banks indicated use of any of these products and used only option contracts.

Specialized computer software for asset/liability management was used in more than one-half of responding Kansas banks. Sixty-seven banks indicated that they use a specialized ALM computer program. Further, several banks indicated they used more than one computer model. In total, 22 different ALM models or specialized programs were listed. Table 25 shows the named models and the number of banks indicating their use. Of the 47 banks listing programs, 34 indicated that the ALM models were purchased

from a retailer; 2 indicated that the models were designed in-house; and 11 did not respond as to the origin of the model (Table 24). Of the 11 banks not indicating model origin, 6 of the models were indicated as a retail purchase by other respondent banks, whereas the other 5 programs appeared to be consulting or correspondent services, which also can be considered a type of retail purchase. In total, 37 banks indicated that computer programs were retail purchases, and 17 banks indicated that programs were designed in-house. Responses to these questions may not appear consistent or complete, but are reported as received from respondent banks.

Several relationships among bank activities and ALM were examined. The relationships of the use of ALM software with total asset volume, KBA district, return on assets, CEO experience, total agricultural loan volume, and bank type (agricultural or nonagricultural) are of interest. Tables 26 and 27 report the number of banks using ALM software in various categories of each of these areas.

The relationships of total asset volume, KBA district, return on assets, CEO experience, total agricultural loan volume, and bank type (agricultural or nonagricultural) with the use of a specific ALM model also were examined. Results indicated very weak or no clear relationships between any of these variables and the use of any specific ALM model or software. Tables 28 and 29 report the number of banks using a specific model or software in each of the noted areas.

## **Summary**

Asset/liability management tools are important to a bank's earnings, liquidity, capital structure, and risk management. Numerous ALM models and techniques are available to financial institutions. Several factors must be considered before choosing an appropriate strategy.

This report has presented the results of a survey of Kansas' bankers analysis of risk and ALM. One hundred seventeen of the 441 banks surveyed responded to the questionnaire mailed in the fall of 1995, for a response rate of 26.5%. Information was collected regarding bank characteristics, risk perceptions, risk management practices, and risk management responses in agricultural lending. The final survey section, and

main area of interest, inquired about ALM practices in Kansas banks.

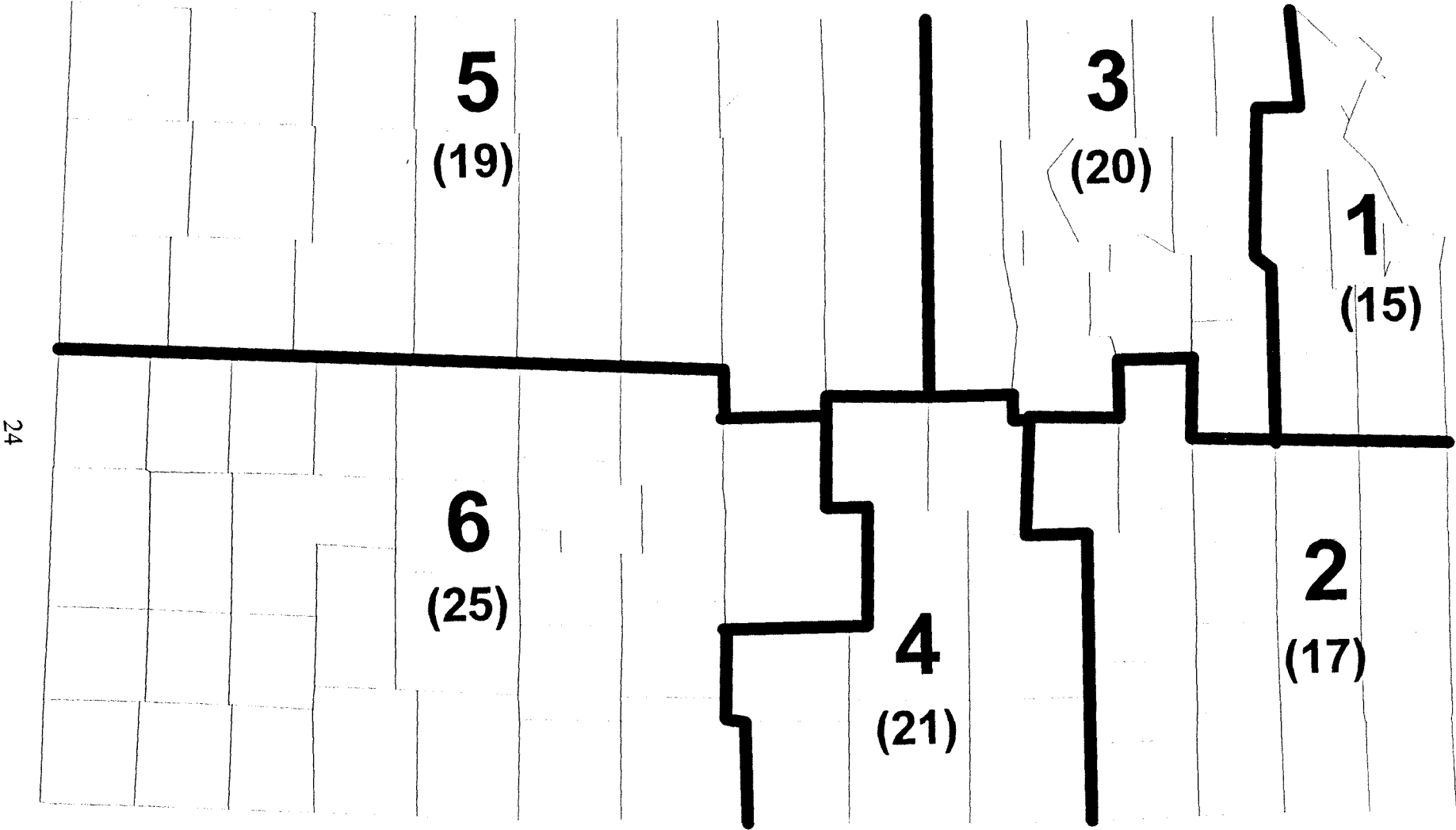
Survey results show credit risk to be the predominant risk concern of Kansas bankers, with cost of funds risk being the second most important. The farm economy and personnel quality are the most important factors contributing to these banking risks. Banks perceive themselves to be in overall excellent financial condition.

Asset/liability management practices vary throughout the state. Nearly 95% of all banks have formal ALM policies, and nearly 90% have ALM committees to oversee various ALM activities. Gap analysis, loan product pricing, and diversification are the major risk-management techniques used in Kansas banks. Secondary market loan sales and derivative products seldom are used by Kansas banks. Specialized ALM computer software is popular in Kansas banks. Little to no relationship appears to exist between ALM software use and total asset volume, KBA district, return on assets, CEO experience, or total agricultural loan volume.

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**Figure 1. Kansas Bankers' Association Regional Banking Districts.**



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



**Table 1. Bank Characteristics: Summary Statistics for Responding Banks**

Characteristic	Mean	Maximum	Minimum	Std. Dev.	Number of Banks
Total Assets:	\$46.94 M	\$225.92 M	\$3.91 M	\$40.03 M	
Capital Asset Ratio:	10.60%	21.89%	6.20%	3.06%	
Loan Deposit Ratio:	61.74%	99.80%	18.00%	15.13%	
Return on Assets: 1-1-94 to 12-31-94	1.40%	14.50%	0.26%	1.76%	
Bank Charter:					
National					40
State & Fed. Reserve Member					14
State & Not Fed. Reserve Member					61
Number of Bank Locations:	1.83	6.0	1.0	1.0	
1					64
2 - 3					37
> 3					14
Banks Owned by a Holding Company:					93
Number of Banks Controlled by the Holding Co.:	1.61	25.0	1.0	2.64	
1					76
2					8
> 2					9
Banks Not Owned by a Holding Company:					24
Banks Controlled by Groups That Have Controlling Interest in More than One Bank:	4.48	25.0	2.0	4.48	25
Banks Not Controlled by Such Groups:					88
Years as a Chief Executive Officer:	10.93	35.0	1.0	8.12	
1 - 5					33
6 - 10					38
11 - 15					17
16 - 20					14
> 20					13

**Table 2. Identifying Risk: Frequency Distribution and Rankings of Mean Risk**

Rank*	Number of Banks					
	Credit Risk	Investment Risk	Liquidity Risk	Cost of Funds Risk	Solvency Risk	Regulatory Risk
1	77	0	5	8	3	14
2	15	20	18	35	1	19
3	10	22	23	34	0	16
4	4	27	26	20	7	22
5	2	28	27	8	18	22
6	0	10	8	3	70	14
> 6	0	1	0	0	7	0
Total	108	108	107	108	106	107
Mean Rank	1.51	3.9	3.71	2.94	5.59	3.57

\*A 1 ranking indicates the greatest risk; a 2 is the second greatest risk, and so on.

26

**Table 3. Identifying Risk: Frequency Distribution and Mean Ratings of Risk Factors**

Rating*	Number of Banks						
	State of the Farm Econ.	State of the Gen. Econ.	Interest Rate Volatility	Competitors Activities	Reg. Q Deregulation	Personnel Quality	Changing Bank Laws
1	71	39	39	35	15	75	40
2	32	65	67	60	48	23	52
3	9	8	6	17	48	12	17
Total	112	112	112	112	111	110	109
Mean Rating	1.45	1.72	1.71	1.84	2.3	1.43	1.79

\*A ranking of 1 is a critical factor; 2 is important but not critical; 3 is not very important.

**Table 4. Frequency Distribution and Mean Ratings of Strength of Bank Components**

Rating*	Number of Banks				
	Capital Adequacy	Asset Quality	Management Ability	Earnings Record	Liquidity Position
1	40	16	30	10	7
2	23	20	35	11	11
3	15	33	20	19	13
4	14	22	12	31	20
5	8	9	3	29	49
Total	100	100	100	100	100
Mean Rating	2.27	2.88	2.23	3.58	3.93

\*A 1 rating is the strongest component; 5 is the weakest component.

**Table 5. Loan Participations as a Percent of Total Loan Volume**

Percentage	Number of Banks
0	38
5	49
10	14
15	7
25	3
> 25	1
Total Responding Banks	112
Banks Using Participations	74
Mean Participation Percentage	3.99

**Table 6. Loan Participations as a Percent of Agricultural Loan Volume**

Percentage	Number of Banks
0	66
5	30
10	9
25	4
85	0
> 85	2
Total Responding Banks	111
Banks Using Participations	45
Mean Participation Percentage	3.64

**Table 7. Loan Portfolio Outside the Geographical Market**

Percentage of Loans	Number of Banks
0	16
5	50
10	23
15	6
20	8
> 20	7
Total Responding Banks	110
Banks Diversifying Geographically	94
Mean Loan Percentage Outside Geographical Market	7.39

**Table 8. Intervals for Repricing Interest Rates on CD's\***

Interval for Change	Number of Banks
Weekly	66
Monthly	10
At the Time of CD Maturity	18
When the Bank's Base/Prime Changes	17
When Competitors Change Their Rates	23
When Market Interest Rates Change	12
Total Number of Banks Responding	116

\* Some banks indicated more than one repricing interval.

**Table 9. Management of Gap Ratios and Interest Rate Spreads**

<i>Gap Ratio Management</i>			
Gap Horizon	Number of Banks Having Gaps that Are:		
	Positive	Negative	Not Calculated
Three-Month Horizon	68	14	21
Six-Month Horizon	57	12	31
Twelve-Month Horizon	77	12	17
<i>Gap Ratio Management</i>			
Gap Ratio	Number of Banks*		
	3-Month Gap	6-Month Gap	12-Month Gap
0	14	12	12
1.0	45	36	42
2.0	10	14	19
> 2.0	13	7	16
Total Responding Banks	82	69	89
<i>Interest Rate Spread Management</i>			
Interest Rate Spread	Number of Banks		
3.0%	9		
4.0%	42		
4.5%	30		
5.0%	22		
5.5%	4		
> 5.5%	3		
Total Responding Banks	110		
Average Spread	4.10		

\*A problem may have occurred with bankers' listing numerical gap ratios.

**Table 10. Volume Distribution of Agricultural Loans**

Dollar Volume	Number of Banks
0 - \$1.0 M	6
\$1.0 M - \$5.0 M	34
\$5.0 M - \$10.0 M	2
\$10.0 M - \$25.0 M	25
> \$25.0 M	8
Total Number of Banks with Agricultural Loans*	101

\*Two banks providing loan portfolio percentages did not indicate agricultural loan volumes.

**Table 11. Financial Statements Required for Agricultural Loans**

Type of Financial Statement	Number of Banks
Balance Sheet	112
Income Statement	99
Cash Flow Statement	98
Schedule F or Full Tax Return	103
Total Responding Banks*	114

\*Many banks required several statements.

**Table 12. Repricing Schedules for Variable-Rate Agricultural Loans**

Repricing Schedule	Number of Banks
Bank Base/Prime Changes	55
National Prime Changes	5
Loan Maturity	27
Annually	18
Semi-Annually	8
Quarterly	10
Monthly	11
Total Responding Banks*	107

\*Many banks indicated more than one repricing option.

**Table 13. Factors Contributing to Lack of Secondary Loan Market Use**

Factor	Number of Banks
Lack of Familiarity with Secondary Loan Market	24
Lack of Demand for Farm Loans in the Secondary Market	32
Cannot Arrive at a Mutually Beneficial Price with Buyer	8
Excessive Paperwork and Other Complications	31
Want/Need to Retain Loans	32
Not Currently Necessary	8
Provide Customer Service	3
Just Don't Want to Sell/Use the Market	3
<b>Total Responding Banks*</b>	<b>102</b>

\*Many banks indicated more than one contributing factor.

**Table 14. Components of Asset/Liability Management Policy**

Component	Number of Banks
Philosophy	91
Objectives	110
Strategies	86
Decision-Making Process	73
Delegations of Authority	87
Limits on Interest Rate Risk Exposure	93
Off-Balance Sheet Authorizations and Parameters	35
Reporting	75
<b>Total Responding Banks</b>	<b>117</b>

**Table 15. Committee Meeting Schedules for Asset/Liability Management**

Meeting Schedule	Number of Banks
Daily	0
Weekly	13
Bi-Weekly	1
Monthly	67
Bi-Monthly	2
Quarterly	15
Annually	1
When Needed	6
<b>Total Responding Banks*</b>	<b>103</b>

\*Some banks indicated more than one response.

**Table 16. Committee Functions for Asset/Liability Management**

Function	Number of Banks
Loan Pricing	71
Funding	83
Interest Rate Risk Measurement and Management	95
Assessing Competitive Factors	76
Liquidity Requirements	88
Off-Balance Sheet Transactions	27
Total Responding Banks	115

**Table 17. Average Percentage of Match-Funded Loan Volume by Loan Type**

Loan Type	Percent Match Funded
Agricultural Real Estate	38.0
Other Agricultural	37.6
Commercial & Industrial	38.5
Non-Ag Real Estate	33.6
Consumer	34.2
Total Responding Banks	42

**Table 18. Factors Used in Determining Tier Status in Differential Loan Pricing**

Factor	Number of Banks
Chattel Margin	46
Owner's Equity	50
Repayment Capacity	49
Average Outstanding Loan Balance	19
Enterprise	9
Geographic Area	3
Total Number of Banks Using Differential Loan Pricing	54



**Table 19. Total Loan Volume Distribution by Repricing Schedule**

Percent of Loans	Number of Banks		
	Variable Rate	Adjustable Rate	Fixed Rate
0 - 5%	31	58	5
5 - 10%	6	4	4
10 - 15%	3	7	2
15 - 20%	8	6	8
20 - 25%	6	3	2
25 - 50%	25	12	23
50 - 75%	11	5	22
> 75%	10	3	36
<b>Total Responding Banks</b>	<b>102</b>		

33

**Table 20. Distribution of Loan Types by Repricing Schedule**

Percent of Loans	Number of Banks														
	Agricultural Real Estate			Other Agricultural			Commercial & Industrial			Nonag Real Estate			Consumer		
	Variable Rate	Adjust. Rate	Fixed Rate	Variable Rate	Adjust. Rate	Fixed Rate	Variable Rate	Adjust. Rate	Fixed Rate	Variable Rate	Adjust. Rate	Fixed Rate	Variable Rate	Adjust. Rate	Fixed Rate
0 - 5%	44	48	27	37	55	14	35	50	12	53	44	21	64	65	3
5 - 10%	2	1	4	3	3	6	4	2	5	1	1	4	6	4	2
10 - 15%	3	1	0	2	1	1	0	0	0	1	1	1	0	0	0
15 - 20%	2	2	5	4	0	4	2	1	6	4	2	4	1	2	2
20 - 25%	2	0	2	1	1	1	2	0	0	0	1	5	0	1	0
25 - 50%	0	3	10	10	4	9	11	11	11	3	4	6	0	1	1
50 - 75%	5	4	3	4	3	7	7	2	10	5	5	3	1	0	0
> 75%	19	17	26	15	6	32	12	6	28	10	17	32	2	1	69
<b>Average Percentage</b>	<b>29.22</b>	<b>27.43</b>	<b>42.41</b>	<b>29.18</b>	<b>13.59</b>	<b>55.27</b>	<b>28.54</b>	<b>16.31</b>	<b>56.18</b>	<b>19.76</b>	<b>29.23</b>	<b>49.65</b>	<b>4.43</b>	<b>3.40</b>	<b>88.80</b>
<b>Total Banks</b>	<b>77</b>	<b>76</b>	<b>77</b>	<b>76</b>	<b>73</b>	<b>74</b>	<b>73</b>	<b>72</b>	<b>72</b>	<b>77</b>	<b>75</b>	<b>76</b>	<b>74</b>	<b>74</b>	<b>77</b>

**Table 21. Techniques Used for Risk Measurement and Management**

Technique	Number of Banks
Gap Analysis	107
Duration Analysis	50
Simulation	28
Swaps	3
Hedging with Financial Futures	0
Hedging with Options	0
Swaptions	0
Total Responding Banks	116

**Table 22. Techniques Used for Liability Management**

Technique	Number of Banks
Match-Funded Lending Programs	48
Callable Bonds	42
Floating Rate Bonds	35
Debt Buybacks	3
Total Responding Banks	116

**Table 23. Techniques Used for Asset Management**

Technique	Number of Banks
Loan Product Pricing and Marketing	104
Fees and Penalties	61
Investments	101
Loan Sales and Participations	51
Total Responding Banks	116

**Table 24. Summary of Computer Software Use for Asset/Liability Management**

General Survey Results	Number of Banks
Use Specialized ALM Computer Software	67
Do Not Use Specialized ALM Computer Software	48
ALM Computer Software Purchased from a Retailer	37
ALM Computer Software Not Purchased from a Retailer	70
ALM Computer Software Designed In-House	17
ALM Computer Software Not Designed In-House	89
Results from Only Banks Naming Computer Software	
Banks Naming ALM Computer Software	47
ALM Computer Software Purchased from a Retailer	34
ALM Computer Software Not Purchased from a Retailer	2
ALM Computer Software Designed In-House	2
ALM Computer Software Not Designed In-House	45
No Indication of Computer Software Origin	11
Software Retail Purchase of No Origin Indication	6
Consulting Services of No Origin Indication	5

**Table 25. Computer Software for Asset Liability Management**

Software	Number of Banks
GRA	7
Profitstar	7
Modern Banking System	6
James Baker	4
DCI (Data Center Inc.)	4
UMB	4
ALEX	3
Finser	3
Thompson	2
Vining Sparks	2
Banker E	1
BancTec	1
Plansmith	1
Jack Henry	1
SAM Farm & Association	1
DPSC	1
FTI	1
Sheshunoff Risk Management	1
Precision Computer System Bank Accounting Information	1
Variance Analysis & Profitability Pricing	1
Angell Financial Services	1
White & Company Consultants	1
Total Number of Software Models	22
Number of Banks Listing Software*	47

\*Several Banks-indicated use of more than one software package

**Table 26. Computer Software for Asset/Liability Management by Total Assets and Bank Type**

<b>Variable</b>	<b>&lt; \$20 M</b>	<b>\$20 - \$50 M</b>	<b>\$50 - \$80 M</b>	<b>&gt; \$80M</b>	<b>Total</b>
Number of Banks	33	51	14	19	117
Number of Banks Using a Model	15	36	8	8	67
Number of Agricultural Banks	27	31	7	10	75
Number of Agricultural Banks Using a Model	12	21	2	5	40
Number of Nonagricultural Banks	6	20	7	9	42
Number of Nonagricultural Banks Using a Model	3	15	6	3	27

**Table 27. Computer Software for Asset/Liability Management by Return on Assets, KBA District, and CEO Experience**

<b>Variable</b>	<b>Return on Assets</b>			
	<b>&lt; 1.0</b>	<b>1.0 - 2.0</b>	<b>&gt; 2.0</b>	<b>Total</b>
Number of Banks	48	60	4	112
Number of Banks Using a Model	32	33	2	67

	<b>KBA District</b>						<b>Total</b>
	<b>One</b>	<b>Two</b>	<b>Three</b>	<b>Four</b>	<b>Five</b>	<b>Six</b>	
Number of Banks	14	17	20	21	19	25	116
Number of Banks Using a Model	11	9	8	12	13	14	67

	<b>CEO Experience</b>						<b>Total</b>
	<b>&lt; 3 Yrs</b>	<b>3 - 5 Yrs</b>	<b>5 - 10 Yrs</b>	<b>10 - 15 Yrs</b>	<b>15 - 20 Yrs</b>	<b>&gt; 20 Yrs</b>	
Number of Banks	20	13	38	17	14	13	115
Number of Banks Using a Model	16	3	19	9	9	11	67

**Table 28. Specific Software for Asset/Liability Management by Return on Assets and CEO Experience**

Software	Number of Banks								
	Return on Assets			CEO Experience					
	< 1.0	1.0 - 2.0	> 2.0	< 3 Yrs	3 - 5 Yrs	5 - 10 Yrs	10 - 15 Yrs	15 - 20 Yrs	> 20 Yrs
GRA	5	3		1		1	2	1	3
Profitstar	4	3		2	1	2	1		1
Modern Banking System	3	3		2	1	1		1	1
James Baker	2	1	1			1	1		2
DCI (Data Center Inc.)	1	3				1	1		1
UMB	2	2		1		1		1	1
ALEX	1	2		1		1		1	
Finser	2	1		1		1		1	1
Thompson									
Vining Sparks	1	1				1		1	
Banker E		1		1					
BancTec		1				1			
Plansmith	1						1		
Jack Henry		1						1	
SAM Farm & Association	1			1					
DPSC									
FTI		1					1		
Sheshunoff Risk Management		1							1
Precision Computer System Bank Accounting Information	1					1			
Variance Analysis & Profitability Pricing									
Angell Financial Services		1							
White & Company Consultants									
Number of Banks Listing Software*	24	25	1	10	2	12	7	7	11

\*Several Banks indicated use of more than one software package

**Table 29. Specific Software for Asset/Liability Management by Total Assets, KBA District, and Bank Type**

Software	Number of Banks											
	Total Assets				KBA District						Bank Type	
	< \$20 M	\$20 - \$50 M	\$50 - \$80 M	> \$80M	One	Two	Three	Four	Five	Six	Agricultural	Nonag
GRA	2	6			2	1		1	3	1	6	2
Profitstar		4	2	1	1	1	2	2		1	2	4
Modern Banking System	4	1		1		2	2		2		5	1
James Baker		3	1					1	1	2	3	1
DCI (Data Center Inc.)	1	2		1	1			1		2	4	
UMB	2	1			1	1				2	2	2
ALEX		3					1			2	2	1
Finser						1		1	1			2
Thompson												
Vining Sparks		1		1		1				1		2
Banker E		1				1					1	
BancTec		1							1		1	
Plansmith			1			1					1	
Jack Henry		1				1						1
SAM Farm & Association			3		1							1
DPSC												
FTI				1					1		1	
Sheshunoff Risk Management				1						1	1	
Precision Computer System Bank Accounting Information		1						1			1	
Variance Analysis & Profitability Pricing												
Angell Financial Services		1					1				1	
White & Company Consultants												
<b>Number of Banks Listing Software*</b>	<b>9</b>	<b>26</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>10</b>	<b>6</b>	<b>7</b>	<b>9</b>	<b>12</b>	<b>31</b>	<b>17</b>
*Several banks indicated use of more than one software package												



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