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Determinants of loan losses in national banks: Size, regulation, and the AICPA model

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DETERMINANTS OF LOAN LOSSES IN NATIONAL BANKS: SIZE, REGULATION, AND THE AICPA MODEL

by

Randy Marl Reed, B.S., M.B.A.

A Dissertation Presented in Partial Fulfillment
of the Requirements for the Degree
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ABSTRACT

Because of recent failures, the AICPA Banking Committee has developed a normative model citing specific variables for auditors to use in bank audits. This research has examined that AICPA model.

In addition, the Auditing Principles Board has identified several areas of concern for auditing internal control structures. Research into size and regulation from other sources has indicated that both are significant modifiers of financial models. Regulations now require banks and holding companies of more than $500 million in assets to submit to an annual independent audit.

The primary purpose of this research was to determine whether the AICPA normative model should be expanded to include size and regulation as explanatory variables for loan losses in national banks. A secondary purpose was to explore the economy of scale enigma in banking. A final purpose was to examine the AICPA model to determine which identified variables were statistically significant in explaining loan losses.

Analysis of covariance indicated that size and regulation did not interact to produce varying levels of effects on loan losses. In addition, a study of the financial information for 236 banks revealed that regulation has no significant impact on bank loan losses. No apparent difference was determined between different size holding companies. The

conclusion was made that regulation requiring audits for banks could not be confirmed as explaining a difference in loan loss determination.

Analysis of covariance indicated that size was a significant influence in explaining loan losses. A significant difference in loan losses was determined between small and medium national banks in this study.

This difference was further explored to reveal that medium banks had larger loan losses than small banks. This diseconomy of scale is inconsistent with most, but not all, previous research in this area.

Seven of the AICPA model variables, consumer loans, lagged loan losses, non-accruing loans, management quality, changes in construction loans, consumer loans and non-accruing loans, were found to be significant influencing loan losses. In addition, a significant trend variable indicated that the model has missing elements that have not yet been determined.

TABLE OF CONTENTS

LIST OF TABLES

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CHAPTER I

INTRODUCTION

As the turbulent decade of the 1980s came to an end, the banking industry had been shaken to its core. During this period, more banks failed than at any time since the Great Depression.[1] Regulators and Congressmen have raised questions concerning the circumstances surrounding these failures. Combined bailout costs for both the banking and thrift industries have been projected by the General Accounting Office (GAO) to reach nearly $500 billion.[2] While no one has any doubt that the taxpayer will ultimately bear the brunt of this debacle, some bank managers are seeking to find legal remedies to address these failures. When ambiguities exist as to potential blame for failed institutions, the insured independent auditor is the one most likely to be sued for damages. How did the public accounting profession find itself in this predicament?

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[1]Sinkey (1998, 726) reported 490 additional failures occurred between 1934 and 1942. In contrast, Amos (1992, 805) found that the FDIC closed 831 banks between 1980 and 1988. Sheshunoff (1994, I.55) asserted that an additional 365 banks were closed in 1989 and 1990.

[2]McConnell (1996, 3) stated the projection by the GAO and claimed that 87% will be coming from taxpayers' pockets.

Issues Involved in the Valuation of Bank Loans

A large portion of bank auditing involves evaluating bank lending practices. If poor lending practices exist, the auditor must recognize the low probability of loan collection and devalue the loan portfolio accordingly. As part of this procedure, bank auditors examine the allowance for loan losses (ALL). The purpose of the ALL is to estimate loan losses needed to reduce the loan portfolio to an amount that is expected to be collected. Knapp (1996, 89) concluded that the ALL "is typically the most problematic account to audit in banking and savings and loan engagements."

The importance of the ALL was illustrated in the collapse of the Penn Square Bank in 1982. This failure occurred partially as a result of poor estimates of the ALL by KPMG Peat Marwick LLP. Losses of $2 billion were estimated from this failure. Knapp (1996, 88) reported that Peat Marwick ultimately paid $45 million to the FDIC and $186 million to settle this and other suits resulting from their "allegedly negligent audits of several banks and savings and loans."

The American Institute of Certified Public Accountants (AICPA) Committee on Banking and the Auditing Standards Division (1986) immediately reacted to the dilemma and partially addressed the problem by publishing an auditing procedural study designed to serve as guidance in auditing the credit losses of banks. Auditing procedural studies are Category B sources for generally accepted accounting principles (GAAP).[3]

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[3]See Delaney, Adler, Epstein, and Foran (1998, 4-6) for a discussion of GAAP hierarchy as defined by the Auditing Standards Board in SAS 69.

One aspect of this publication defines a normative model for auditors to follow when auditing the ALL. This paper examines the adequacy of the AICPA model in explaining loan losses.

In addition, two additional variables were tested as part of an analysis of covariance model to determine if the explanatory power is increased by their presence. These variables, bank size and regulatory requirements, are part of the banking internal control environment suggested by Statements on Auditing Standards (SAS) #55 (1989, 260). Size has also been suggested to lend an economy of scale to the banking environment. As a backdrop for the problem, the issue of bad debt expense estimation for banks is placed in historical perspective.

Banking Audit History

The Industrial Revolution forever changed business operation in America. Prior to the 19th century, most companies were managed by the owner(s). As companies progressed in size and complexity, company owners hired stewards to manage their firms. Auditing, as a separate accounting function, grew out of a perceived need by owners to evaluate the stewardship of those agents. As the corporate style of ownership increased, the demand for accountability was extended as well. The audit function was an extension of this demand.

The banking industry lagged the industrial environment in the demand for auditors because of special circumstances. The first circumstance revolved around the fact that

most banks prior to 1930 were privately held firms. As such, there was little or no demand for audits from stockholders or investors.

Regulation of the banking industry began to increase as the dominant bank business form changed slowly from partnerships and closely held firms to publicly traded corporations. This effect was intensified as a result of the stock market crash of 1929. The Securities Exchange Act of 1934 created the Securities and Exchange Commission (SEC) with oversight authority over these corporations. One of the first SEC regulations required audits of financial statements for publicly traded corporations.

The second circumstance that initially slowed the demand for audited financial services was the radical differences between banking industry practices and generally accepted accounting practices (GAAP). Savage (1973) noted that because of these differences, auditors were generally precluded from expressing an unqualified opinion upon the financial statements of most banks.

In 1964, the Federal Reserve (FED) and the Federal Deposit Insurance Corporation (FDIC) changed banking industry practice by requiring that GAAP be followed more closely in banking practice. In addition, auditing standards began to allow for exceptions to GAAP because of industry standards. As auditing standards changed, an increasingly larger number of banks began to be audited. From that change, Savage (1973, 5) could report that "by 1971, a majority of the first hundred largest banks had independent audits." Savage continued to note that in 1971, the SEC "required for the first time opinion audits of bank holding companies and their consolidated subsidiaries" (8).

The banking environment began deregulation in the late 1970s as public policy changed with the intention of increasing competition between financial institutions. With the passage of (1) The Financial Institutions Regulatory and Interest Rate Control Act of 1978, (2) The International Banking Act of 1978, (3) The Depository Institutions Deregulation and Monetary Control Act of 1980, and (4) The Garn-St Germain Depository Institutions Act of 1982, the lending industry was substantially deregulated.

Boyd and Gertler (1994, 2) partially attributed the bank failures that occurred during the 1980s upon the deregulated environment created by these enactments. Jeffrey, Norris, and Witowski (1992, 20) concurred and added two additional factors by stating:

> While loan portfolio strength has always been a critical determinant of financial condition, the importance of loan evaluation judgment has been magnified by economic conditions of the 1980s, by deregulation, and by management quality concerns.

The deregulated environment created by these new laws helped to ignite the large numbers of bank and S&L failures during the decade of the 1980s. Jeffrey, et al. further stated, "Recent lawsuits have alleged that auditors have failed to detect material overstatements of the value of bank loan portfolios" (20). Lys and Watts (1994, 76) reported 207 lawsuits were filed against auditors during this era, representing 42 percent of all lawsuits filed against auditors between 1956 and 1994.

Goldwasser (1995, 21) reported: "Cases against accounting firms have consisted largely of claims arising out of the S&L crisis, plus the usual post-recession claims consisting of suits arising out of failed bank loans . . . ." Goldwasser contended that

auditors would be more capable of defending themselves against liability lawsuits if proposed tort reform was enacted.

In 1995, Congress passed and subsequently overrode a presidential veto to enact The Private Securities Litigation Reform Act of 1995 (H.R. 1689). King (1997, 101-2) reported that this act mitigates auditor liability by (1) discouraging abusive claims by investors, (2) providing more protection against securities fraud, and (3) creating safe harbors for auditors who utilize pro forma statements.

1986 Tax Reform Act and Loan Losses

In the middle of this decade of bank failure, Congress revised the Tax Code. The 1986 Tax Reform Act (86 TRA) (subsequently, the Internal Revenue Code of 1986) had many effects on business in the United States and was particularly adverse to the banking industry. One area of banking affected by the 86 TRA was the recognition of loan losses and the maintenance of a loan loss reserve as part of the core capital of a bank.

Walter (1991, 20) stated that all federal banking regulators "require that all banks include in their financial statements an account named allowance for loan losses (*ALL*)" which is used to absorb loan losses both from loans currently identified as bad and from apparently good loans that may go bad later. Conway and Siegenthaler (1987, 8) reported that the loan loss reserve was used "to enable a bank to absorb all future loan losses relative to its loan portfolio without impairing capital."

Prior to passage of the 86 TRA, all banks could use either a percentage of loan losses up to a set ceiling for the reserve (percentage method) or a six-year experience

moving average (experience method) to estimate their loan losses recognizable for tax purposes. The 1986 Tax Code revision required large banks or large holding companies (LHC's) with $500 million plus in total assets to deduct only the extent of actual charge-offs (specific charge-off method). All other banks and small holding companies (SHC's) were allowed to use either the percentage method or the experience method for tax recognition of loan losses.[4]

A conflict emerged after passage of the 86 TRA because of divergent interests of two regulatory agencies, the Internal Revenue Service (IRS) and the U.S. Comptroller of the Currency (OCC). The IRS wanted adherence to the 86 TRA specific charge-off method, while the OCC wanted to rely on a tax concept which allowed regulators to determine that a charge-off was authorized and thus allowable (conclusive presumption). Von Storch (1992, 17) reported that to resolve the dispute, the Tax Code was amended[5] to state that a "debt charged-off for regulatory purposes is conclusively presumed to have become worthless for tax purposes the same year." Thus, loan loss expense determination became a matter of regulation, rather than tax law.

Regulation and Size Theory

In several instances (notably the 86 TRA and the 1991 FDIC Improvement Act), banking regulations have had differential impacts upon banks because of arbitrary size

[4]IRC Section 585(b)(1)(A).

[5]IRC Section 166.

specification by regulators and Congress. Why have regulators decided that banks should be treated differently because of their size?

With the failure of the Continental Illinois Bank in 1984, the Comptroller of the Currency propounded a new policy that stated that some 11 bank holding companies were "too-big-to-fail."[6] The origin of this policy began in the Depression era when failures of large banks were observed to be contagious. O'Hara and Shaw (1990, 1599) presented evidence that this policy was extended to more than the original 11 bank holding companies. Boyd and Gertler (1994, 2) found that this policy subsidized risk-taking by large banks.

Apparently, regulators also were influenced by early research suggesting that an economy of scale existed in the banking industry which allowed larger banks to absorb the additional costs imposed by regulatory statutes. McEachern (1990, 51) stated: "Size is an advantage in delivering financial services to the public because it takes a significant investment in both product development and data processing capability to stay competitive in today's market."

Regulation and Holding Company Effect

Another topic of interest in banking research has been the change in the business form of banks. As previously reported, the history of bank ownership began as a small group of investors chartering and managing a bank. As the banking industry began to grow and prosper after the 1929 Depression, two distinct patterns of operation became

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[6]In September 1984, The Comptroller of the Currency testified to Congress that 11 bank holding companies were "too big to fail."

evident. One method that evolved was the use of branch banking in which a large bank placed small banking units in dispersed geographical locations around the central unit. The main purpose of this decentralization was to reduce competitive pressure by preventing other banks from starting operations in the branch bank area.

The second method evolved because of state regulation that forbid branch banking in part or in total. In these states, independent banks joined together as holding companies to compete more effectively with larger banks. Sinkey (1998, 9) reported that the rapid expansion of this type of ownership resulted in 93 percent of all bank deposits being held by bank holding companies.

With the inflow of capital into these holding company banks, federal regulatory intervention was inevitable. Sinkey (1998, 675) reported that the federal government moved to regulate these multi-bank holding companies with The Bank Holding Company Act of 1956. In 1979, this Act was amended to bring single bank holding companies into the regulatory fold.

The regulatory effect increased with the passage of 1991 FDIC Improvement Act. One of the main intentions of this legislation was to improve accountability of large banks and large holding companies. As such, banks and bank holding companies with total assets larger than $500 million were required to have audited annual financial statements.

Size, Regulation, and the AICPA

As part of audit planning, the auditor should examine the internal control structure of the organization being audited. The knowledge gained from this examination allows the

firm to set the control risk and the level to which it will rely on the control structure. The Auditing Standards Board in writing SAS #55, stated that size and regulatory requirements are part of the control environment of an organization (AICPA, 1989, 260). As such, the auditor should consider them in his/her[7] assessment of internal controls. The research question to be answered is why did the Banking Committee omit these items from consideration for auditing the ALL?

Normative Theory and the AICPA Model

The AICPA interest in bank auditing resulted in the printing of three bank audit procedural guides in 1968, 1983, and 1992. In addition, the Institute has also published one procedural study for auditing the allowance for loan losses in 1986. When writing these guides, the Banking Committee (1992, ii) attempted to "provide practitioners with non-authoritative practical assistance concerning auditing procedures."

In banking, procedures evolved from observations of business practices. Bankers noticed that defaulted loans have certain characteristics. From these observations, bankers and bank regulators deduced factors that influence loan loss. From these observations, the AICPA Committee on Banking (1986, 13-14) formulated a normative model which stated that in establishing the scope of the work to be performed, the following factors should be considered by the CPA:

1. composition of the loan portfolio,

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[7]All pronouns will refer to both genders from this point forward.

2. identified potential problem loans, including loans classified by bank regulatory agencies,
3. trends in loan volume by major categories, especially categories experiencing rapid growth, and in delinquencies, nonaccrual, and restructured loans,
4. previous loss and recovery experience, including timeliness of charge-offs,
5. concentrations of loans to individuals and their related interests, industries, and geographic regions,
6. size of individual credit exposures (few, large loans versus numerous, small loans),
7. degree of reliance placed on internal loan review and internal audit functions,
8. total amount of loans and problem loans, including delinquent and nonaccrual loans, by officer,
9. lending, charge-off, collection, and recovery policies and procedures,
10. local, national, and international economic and environmental conditions,
11. experience, competence, and depth of lending management and staff,
12. results of regulatory examinations, and
13. related party lending.

From an examination of these factors, the Committee must have been heavily influenced by finance literature, particularly portfolio theory. Modern portfolio theory (MPT) allows bankers to reduce the loan loss risk by diversifying their loan portfolio over the broad spectrum of loan types, as well as geographical dispersement.

Komar (1993, 31) reported that "the most common problem leading to excessive loan losses is the over concentration of lending exposure to a risky or poorly performing

industry." Bennett (1984, 155) reported that "regulators and management both tend to favor a well-diversified loan portfolio to reduce the risks of the bank failing." Bankers became acquainted with the concept of portfolio diversification from the works of Sharpe (1964) or Fama and Miller (1972). Bennett (1984, 153-5) proposed that MPT allows banks to determine the risk premium and price their loans accordingly.

The model proposed by the Banking Committee apparently attempted to develop normative accounting theory using MPT. Normative accounting theory has been defined by Hendriksen (1982, 56) as "starting from an observation of existing procedures or of business practices." Hendriksen (1982, 1) also stated that "all theories are subject to modification of abandonment with the development of new information" since accounting theory "guide[s] the development of new practices and procedures." Thus, if other factors are found to explain the ALL more adequately, the AICPA model should be modified to account for this improvement.

In addition, the AICPA model has incorporated the use of economic variables. A direct relationship appears to exist between the state of the economy and bank failures. As the economy worsens, the number of failed banks tends to increase because of increased loan losses. Conversely, Chirinko & Guill (1991, 785) reported "the amount of risk faced by depository institutions is of substantial concern for policy-makers because of the perceived link between their stability and the performance of the economy."

Statement of the Problem

Because audit failures result in large dollar court judgements against audit firms, more effective audit techniques must be developed. The area that has had the largest impact on bank failure has been loan losses. This study analyzes the ways that loan losses have been estimated both in the past and present in an effort to extend a normative audit model proposed by the AICPA. An attempt was made to determine whether differences in loan losses exist between national banks of different sizes and under different regulations. The study posed the following research questions:

1. Does regulation affect loan loss recognition in national banks? This question was addressed by the following:
   A. Does a difference exist in loan losses between small SHC member banks and small LHC member banks?
   B. Is there a difference in loan losses between medium SHC member banks and medium LHC member banks?
2. Is there a difference in loan loss recognition by national banks within LHC's due to bank size? This question was addressed by the following:

   Is there a difference in loan loss recognition between small and medium LHC member banks?
3. Is there a difference in loan loss recognition by national banks within SHC's due to bank size? This question was addressed by the following:

   Is there a difference in loan loss recognition between small and medium SHC member banks?

4. Do loan loss recognition differences translate into economies or diseconomies of scale in small and medium banks? This question was addressed by the following:

   A. Are loan losses of small banks larger than those of medium banks?

   B. Are loan losses of small banks smaller than those of medium banks?

5. Do size and regulation interact in the determination of loan losses in national banks? This question was addressed by the following:

   Is there a difference in loan loss recognition between small LHC member banks and medium SHC member banks?

6. Do the variables suggested by the AICPA Banking Committee explain loan losses in national banks? This question was addressed by the following:

   Are the suggested variables statistically significant in explaining loan losses?

Purpose of the Study

The primary purpose of this study was to determine whether size and regulation help explain loan losses in national banks. A secondary purpose was to determine whether economies or diseconomies of scale exist in banking. A third purpose was to investigate whether the factors in a normative model proposed by the AICPA helped explain loan losses in national banks.

Sources of Data

Primary data used in this study was collected from two database sources. The first source was Sheshunoff's The Bank Quarterly: Ratings and Analysis, which is published quarterly by Sheshunoff's Information Service. This journal contains quarterly financial

data about each insured bank obtained by tabulating the Reports of Call required by FDIC regulations of all insured banks.

The second source was the U.S. Bureau of Labor Statistics. This governmental agency collects economic data in many different formats. The collected data are assembled in flat files in a database known as LABSTAT.[8] The Bureau of Labor Statistics breaks down the employment and unemployment figures into several different demographic divisions. The division proposed in this study was the unemployment percentages in each county.

Secondary sources of data were books, journals, pamphlets, and government documents from libraries and government archives. These sources were used as background and historical data.

Methods and Procedures for Collection and Treatment of Data

The population of national charter banks in 1992 was comprised of 3691 banks,[9] the majority of which were owned by holding companies. Compact Disclosure[10] was utilized to identify the holding company affiliation of publicly traded banks.

A further refinement of the population was the exclusion of large banks. These banks were defined as having more than $500 Million in total assets. Large banks were

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[8]The Bureau of Labor Statistics is listed on the Internet at the following: URL:http://stats.bls.gov/blshome.html.

[9]Compiled by Polk's Bank Directory (1992, VIII).

[10]Compact Disclosure is a relational database that provides information on all publicly traded companies that follow SEC guidelines.

excluded in part because of the large differences between their types of operations and those of small and medium banks. In addition, large banks may add a confounding factor to the study because of the large percentage of their loan portfolio committed to foreign loans. Since the vast majority of small and medium banks limit their business sphere to the national market, a bias might have been introduced into the study if large banks were included. Other sources used to identify population units were Moody's Bank & Finance Manual, Sheshunoff's The Bank Quarterly: Ratings & Analysis, and Polk's Bank Directory.

Data Collection

From Compact Disclosure and Moody's Bank and Finance Manual, two lists of publicly traded bank holding companies were assembled. One list entitled Large Holding Companies (LHC) was comprised of holding companies that owned more than $500 Million in total assets. The other list, identified as Small Holding Companies (SHC), contained holding companies which owned $500 Million in total assets or less. Individual banks were identified as belonging to each type holding company. These banks were segregated into two classes: (1) small banks having less than $100 Million in total assets and (2) medium banks having between $100 Million and $500 Million inclusive in total assets.

A random selection of 59 banks was drawn from each subgroup of size and affiliation grouping. This number represented at least 20 percent of the number within each group and assured adequate sample size for statistical testing.

Treatment of Data

The collected data were tabulated into a database and examined for standard statistical measurements of central tendency and dispersion (see Appendix I). As part of this procedure, the data were examined for outliers. Two observations were identified as obvious outliers, which were determined to be misplaced decimal places and corrected.

In addition, tests of normality indicated significant departures from normal distributions. Since nonnormally distributed data can lead to incorrect conclusions in inferential statistical analysis and may bias the correlation coefficients, Conover (1980, 337) suggested the use of rank transformation as a way to correct partially for this defect. Therefore, the data were ranked to mitigate the nonnormal nature of the distribution.

Methodology

One purpose of this research was to determine if differences existed in loan loss recognition due to size and regulation in the presence of the factors suggested by the AICPA normative model. To accomplish this goal, rank analysis of covariance (ANCOVA) was the most appropriate statistical procedure to perform hypothesis testing on the sample data.

Quade (1967, 1198-1200) first recognized that an analysis of covariance performed on ranks was fairly efficient even in the absence of the usual ANOVA assumptions when used with large samples. Puri and Sen (1969, 617-18) analytically proved that Quade was correct by establishing that ranked ANCOVA results were relatively efficient compared to the classic parametric test results. Conover and Iman (1981, 127) state that these

procedures "may be more robust and powerful than their competitors in non-normal situations."

Assumptions

In any study, certain parameters must be set and suppositions made. The following assumption, limitations and delimitations define those areas.

A. The financial data collected from secondary sources was assumed to be accurate.

Limitations

The limitations of the study were as follows:

1. The study was limited to the extent that the selected banks were representative of the total population of national banks throughout the nation.
2. The changes in banking regulation and economic conditions may have caused impairment of the interpretation of the results of the study.
3. The economic conditions that occurred during this study might have biased the results. Readers are advised that the results could be tainted by these conditions.
4. Some variables suggested by the Banking Committee were bank specific and constituted proprietary information that could not be elicited from the banks. The inability to access this data may have caused biased or limited results.

Delimitations

The delimitations of the study were as follows:

1. The population from which the sample banks were drawn was limited to banks which had survived the recession and subsequent high loan loss era of the late 1980s. Hence, a survivor bias may have existed among the population.
2. The population from which the sample banks were selected was limited to those banks that did not change holding company affiliation during the time period of the study. Since this era was one in which large numbers of banks were acquired by holding companies, a selection bias may have occurred as a result of this condition.
3. The study encompassed three years: 1991 through 1993. Caution should be used in interpreting the results of this study because the normal operating cycle of banks is five years.[11] Thus, the relatively short time span used in this study may have biased the results.
4. The population was defined as publicly traded national banks. The elimination of closely held banks from the study may have biased the results.
5. Large banks (over $500 million in total assets) were eliminated from the population. This delimitation may prevent inferences to be universal in scope.

Significance of the Study

This study was performed to expand normative theory concerning the factors that auditors should use in examining the ALL of commercial banks. An attempt was made to

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[11]See Austin (1992, 38)

determine whether a normative model proposed by an AICPA industry audit guide explains differences in loan loss recognition in the presence of regulatory and size effects. In addition, the possible interaction of regulatory and size effects was explored.

Interest in bank solvency has been highlighted in the last decade by the large numbers of bank and thrift failures that have occurred. Some public officials and banking groups have criticized the accounting profession for some of these failures due to "faulty audits." As a result of ensuing litigation, the accounting profession has suffered serious financial setbacks.

To avoid repeating these costly mistakes, new guidance is needed in planning bank audits. A better understanding of banking regulations and environment is crucial to auditors engaged in performing these audits. Old methods and models need to be reexamined to discern what is useful in the modern dynamic global market. Therefore, this study examined a normative model for auditing the ALL to evaluate the management assertion of valuation of the loan portfolio. In addition, two new factors were added to the model and their impact was determined.

The accounting rule-making bodies traditionally have procrastinated in making changes to generally accepted accounting principles and auditing standards. One notable exception to this tradition has been the AICPA interest in the banking environment which has resulted in the creation and two amended audit guides for banks.[12] In addition, the AICPA Research Division has shown in the past a particular involvement in auditing the

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[12]An Industry Audit Guide entitled "Audits of Banks" was written by the AICPA Banking Committee in 1968 and subsequently revised in 1983 and 1992.

ALL account by issuing an audit guide specifically for this audit element.[13] This study attempted to illustrate to the profession and the AICPA that a new update for auditing the ALL account is needed.

Prior research in the area of loan losses has been concerned principally with predicting future loan losses. Bankruptcy prediction has also been exhaustively examined. Several methodologies have been used to determine the appropriate amount to place in the ALL. Another area of interest has been the use of loan classification as a means of determining loan defaults. The effects of TRA 86 and governmental regulations on loan losses have also been explored.[14] These topics will be discussed further in Chapter II.

No prior research has been identified that attempted to test whether the model proposed by the AICPA has any validity. Jordan (1986, 88) found some of these same variables to be statistically significant in his predictive study of loan loss reserves. Several of his variables later appeared in the AICPA model. His study suggested that size might discriminate loan losses among commercial banks located in Louisiana. However, the AICPA model did not utilize his conclusion. This research extended Jordan's findings by adding size and regulation to the AICPA model.

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[13]The Committee on Banking produced "Auditing the Allowance for Credit Losses of Banks," an auditing procedure study, in 1986.

[14]See especially McNichols and Wilson (1988), Scheiner (1981), and Beidleman (1973).

Plan of the Study

The remaining chapters of this study will include Chapter II, A Review of Related Literature; Chapter III, The Research Design; Chapter IV, Results of the Study; and Chapter V, The Summary, Conclusions, and Implications for Future Research.

Seven topics of research will be covered in Chapter II. These topics consist of (1) a review of loan loss methodologies, (2) bankruptcy prediction literature, (3) a discussion of economy of scale, (4) tax implications of loan loss recognition by banks, (5) loan classification research, (6) governmental regulation, and (7) GAAP recognition of loan losses.

CHAPTER II

REVIEW OF RELATED LITERATURE

This section examines previous banking research. Special attention is given to the areas of loan loss determination, bankruptcy prediction, economy of scale, tax effects of TRA on banks, loan classification, governmental regulation of loan loss recognition, and GAAP recognition of loan losses.

The decade of the Eighties was exemplified by industrial deregulation. The banking industry was no exception. It preceded other industries by beginning deregulation in the late 1970s in response to the inflation of that era. Holdren, Bowers and Mason (1994, 290) found this deregulation to have had a significant impact on asset and liability decomposition in their study on 103 banks.

During the 1970s, prime lending rates exceeded 20 percent, while long-term loans were locked in at rates under 12 percent. This disparity caused lending rates to soar. Deregulation of the banking industry allowed S&L's and other thrifts to compete directly with banks for depositor funds by permitting checking accounts and certificates of deposits. These services had been offered only by banks prior to the environmental change.

In addition, the rate cap on certificates of deposits (CD's) was lifted to allow the interest rates on these deposits to float with the prime rate. The increased competition for deposits forced banks and S&L's to offer increasingly higher interest rates for long term CD rates. Financial institutions paying high CD rates were forced to invest in increasingly riskier loans as they attempted to recapture their interest payments. With the end of hyper-inflation, the surviving institutions paying these extremely high CD rates were forced to reevaluate their loan portfolios.

Many financial institutions did not survive the default of high risk loans made during the inflationary period. This instability in the banking industry did not go unnoticed by the banking regulators who noted in the FDIC Annual Report (1983, x) that the increased competition ". . . has given rise to increased risk and greater opportunities for banks to fail."

The market instability created by this deregulation allowed banking researchers great opportunities for exploration. This chapter reviews current research in seven areas to include (1) a review of loan loss methodologies, (2) bankruptcy prediction literature, (3) a discussion of economy of scale, (4) tax implications of loan loss recognition by banks, (5) loan classification methods, (6) governmental regulation, and (7) GAAP recognition of loan losses. The first area examined is methods for determination of loan losses.

Loan Loss Methodologies

Past banking accounting practice has recognized losses from loans prior to the actual write-off of the loan. This standard accounting practice resulted in an expense account known as the provision for loan losses and a contra asset account known as the allowance for loan losses (ALL). Baskin (1992, 95) reported that the GAAP concept behind the establishment of the ALL is SFAS 5, "Accounting for Contingencies," which requires "losses to be recognized in the financial statements in the period they occur, not before or after the loss event."

To accomplish the objectives of SFAS 5, an estimation of loan loss must be made from the loan portfolio. This loss increases both the ALL and the loan loss expense for the year. Researchers and bank officers have examined several methods with the intent of achieving a better estimation. Some of the more common types are examined in the following sections.

Markov Chains

Cyert, Davidson, and Thompson (1962, 296) explored an estimation technique known as Markov chains to determine the appropriate allowance amount. Markov chains is a mathematical approach that uses the sum of the variance estimates for each cyclic repetitive Markov chain to determine an appropriate allowance amount. Markov chain methodology was described by Orgler (1975, 92) as being too complex and economically unjustified for routine reviews and examinations.

Migration Analysis

Migration analysis has also been used to estimate future loan losses. Austin (1992, 38) described this tool as a better way to assess how a bank's loan portfolio changes in response to economic conditions. He stated that he

> . . . used five to seven years' data because this span reflects the economic cycle in which the bank operates and includes enough data to smooth out distortions from a particularly good or bad year.

While extremely computer intensive, migration analysis has been shown to establish refined determinations of loan losses by tracking and rating the risk of charge-offs as they occur.

Kosiek (1992, 7) stated that migration analysis is most effective ". . . as it quantifies the movement of homogenous loans to and from individual delinquency categories." However, Weinstein (1992, 14) criticized migration analysis because it is "too dependent on past performance, which might not be a good indicator of current market conditions."

Econometric and Regression Models

Econometric modeling and multiple regression appear tc dominate the methods being employed by most researchers. Giroux and Rose (1981, 151) found that econometric models and multiple regression analysis were widely used for quantitative approaches in predicting economic events.

Graham and Humphrey (1978, 500) investigated the use of bank examination data as predictors of bank net loan losses. They analyzed three models to determine which best explained loan losses for 501 banks segregated for size. The findings of the study

indicated that predictive models would need to be different for each size of bank. This finding validates that of Jordan (1986, 135), which stated that size discriminated loan losses in Louisiana for commercial banks.

Hogan, Frankle, and Merz (1987, 65) performed a descriptive analysis of 93 variables for a time period of 42 months in an attempt to determine the factors affecting loan losses. They stated that "somewhat surprisingly, no previous attempts to build aggregate loan loss models could be found in the banking literature." Their findings indicated that a model with four variables lagged six months (loan balances, non-accruals, initial unemployment claims and non-agricultural employment) explained 83 percent of the consumer loan losses. Two of the variables they found to be statistically significant were used in the current topic; i.e., non-accruals and initial unemployment claims.

Moore (1992) extended the study of aggregate loan loss determination begun by Hogan, et al. (1987). Moore addressed the question of aggregate loan loss determination from an auditor's prospective in exploring the population of insured small banks (banks with assets of less than $50 million insured by the FDIC) for the year of 1986.

Moore found that the three loan areas of oil and gas, real estate and agriculture were statistically significant. Management also was found to be highly significant and thus, was included in the current study as well. However, the model taken as a whole explained only 18 percent of the variation in loan losses (118-130).

O'Connor and Rollauer[15] (1988, 34) concluded that in their experience, an appropriate allowance could be determined by quantitatively examining the following areas: large classified loans, other classified loans, loan concentrations, portfolio trends, trends in overdue and nonperforming loans, growth in off-balance-sheet credit risk, economic conditions, and risk of error due to individual loans and pools of loans. Loan concentrations and portfolio trends were found by O'Connor and Rollauer to be significant and were included in the current research.

Current Practice

Estimating loan losses has tended to be a "gut feel" approach in past banking practice. Banks either used a set percentage of loans or a modified aging schedule approach in determining the amount to be written off to expense. Current banking practice (OCC Banking Circular 201) requires banks to document how the Allowance for Loan Losses (ALL) was determined.[16]

In summary, several methods have been explored by various researchers in efforts to determine loan losses with better precision. To date, no one method has been established as a "method of choice." Lack of computer availability hampered initial

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[15]Mr. O'Connor was at the time of publication of this article the national audit partner--banking services for Deloitte Haskins & Sells. Mr. Rollauer was director for bank supervision with the Comptroller of the Currency.

[16]OCC B.C. 201 and its supplement, OCC B.C. 201 (Rev.) (Supplement 1), require national banks to provide for "inherent losses" that probably exit in the loan portfolio. In addition, this loss estimation should cover only one year's losses. While no particular methodology is specified, documentation is required. B.C. 201 emphasizes that loan losses should reflect current economic conditions, loan concentrations, trends in loan volume and terms, changes in loan policies and procedures, and the experience and depth of the lending staff and management.

research, but technology development has enabled many methods to be used that formerly were too "computer intensive."

Bankruptcy Prediction Models

One element with which auditors contend is the determination of whether a "going concern opinion" is warranted by the financial position of the audit client.[17] In essence, an auditor is predicting the probability that a client is about to become bankrupt. Lynn and Neyland (1992, 49) commented that the key determinants in bankruptcy cases involve the valuations of assets. These valuation determinations are often the most hotly contested items in bankruptcy court as well.

Previously, auditors have used ratio analysis to make this going concern determination. Altman (1968, 609) stated that statistical analysis is preferred by academicians to ratio analysis. Several researchers have used various models and statistical methodologies to make bankruptcy predictions in various business environments.

Altman combined the use of ratio analysis and statistical analysis in his seminal work in bankruptcy prediction. Discriminant analysis was used to classify corporations based upon certain key financial ratios and whether bankruptcy proceedings had been filed.

Sixty-six firms were selected with half in each of the two categories. Using this sample, Altman (1968, 599) determined that 95 percent of the sample could be properly

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[17]SAS 59 (AICPA 1989) requires auditors to evaluate the viability status of their clients as part of every audit examination and provides guidance to the auditor on steps to be followed in making such decisions.

classified. He further concluded that by using another sample accurate predictions could be made with confidence two years in advance of actual bankruptcy.

Meyer and Pifer (1970, 854-5) extended Altman's use of ratio analysis and statistics into the banking arena. Their contention was that four factors explain bank failure: (1) local economic conditions, (2) general economic conditions, (3) quality of management, and (4) honesty of employees. Meyer and Pifer used 10 financial ratios to proxy these factors for the period between 1948 and 1965 for a matched pair sample of 30 closed banks and 30 open banks. Their findings indicated that financial positions can be accurately evaluated for a lead time of one or two years (867).

Sinkey (1975, 21) continued Altman's research by analyzing the characteristics of problem banks. In this study, he used discriminant analysis to classify banks into two groups: problem banks that have violated a law or regulation or have engaged in unsafe or unsound banking practices and non-problem banks. His findings indicated that "measures of banking factors such as asset composition, loan characteristics, capital adequacy, sources and uses of revenue, efficiency, and profitability are good discriminators between groups."

Previous studies have used annual data in the prediction of bankruptcy. Baldwin and Glezen (1992, 289) argued that quarterly data might be more reliable and useful in predictive models. Twenty-four financial ratios were used as classifying variables in a discriminate analysis of 40 bankrupt and 40 nonbankrupt firms for a period from 1977 to 1983. Their findings indicated that the use of quarterly data allowed predictions of bankruptcy up to nine months earlier than an annual model with no loss of accuracy.

Siems (1992) used a linear programming technique known as data envelopment analysis (DEA) to quantify the role of management. This research was the first known model to incorporate the use of DEA in the banking industry. In effect, Siems transformed the finance theory of the capital assets pricing model (CAPM) to project an "efficient frontier" for banks. Siems found that less efficient banks were more inclined to fail. He concluded that this methodology could be used to predict bank failures (38).

In summary, the Baldwin and Glezen (1992) study contributed the concept to the current topic of quarterly data for bankruptcy prediction. Other studies either used an unusual methodology or similar variables to previously studied loan loss research. Sinkey's (1975) findings lend credence to the use of asset composition, loan characteristics, capital adequacy, sources and uses of revenue, efficiency, and profitability as theoretical constructs for variable development. Meyer and Pifer's (1970) development of local economic conditions and quality of management led to the use of these variables in the current study.

Bankruptcy prediction research has been limited to ex post research. This usage severely restricts the validity of the findings. In addition, most researchers have not used theory to test for variable significance before using the variables to predict bankruptcy. This approach has led to many inconsistences as a result.

Since loans are the largest assets that banks own, a high default rate of these loans is the main reason most banks become insolvent. The following area addresses the economy of scale issue that was raised in the Berger, Hanweck, and Humphrey (1987) study and its relationship to the size effect on loan losses.

Economy of Scale

A significant number of researchers have investigated the banking industry to determine the existence of an economy of scale. The results have been inconsistent at best. Reed, Cotter, Gill and Smith (1976, 39) indicated that "although much of the early research on bank markets concluded or at least implied that the economies of scale were not substantial in banking, more current studies have assigned greater value to bank size." Several studies have exhibited similar results as to the existence of economies of scale in banking, but have differed as to the determination of the bank size where these scales exist. Berger, Hanweck, and Humphrey (1987, 515) found modest economies of scale existing in relatively small banks. In contrast, Clark and Speaker (1994, 23) found that economies of scale existed in banks with up to $1 billion in total assets. These inconsistencies suggested that economy of scale be examined in this study.

As tax law changes, banks are forced to comply with regulation from two areas: Internal Revenue Regulations and Office of the Controller regulations. Conflicts between the two areas have often caused problems. The next area will focus on research concerning the tax aspects of loan loss recognition.

Implications of 86 TRA for Loan Loss Recognition

Before passage of the Tax Reform Act of 1986 (86 TRA), Hipshman (1987, 90) related that all banks were allowed to choose one of two methods for determining the loan loss deduction for tax purposes. One allowable method used a chosen percentage of total loans to be written off as uncollectible. The other method was an aging method for loans.

An experience factor determined the percentage of bad loans to be written off in each category.

Both methods provided an opportunity for banks to smooth income and thereby delaying or avoiding their tax liability. Goldman (1987, 365) reported that the main concern that triggered the 86 TRA reform was the ability of taxpayers (banks) to deduct losses prior to their occurrence.

With the passage of the 86 TRA, banks with more than $500 million in total assets (large banks) could no longer use the reserve method of accounting for loan losses. Ator and Claytor (1987, 104) reported that large banks had to recapture their loan loss reserve against income over a four-year period or write down the closing balance against losses on outstanding loans as they occurred.

Weld (1991) hypothesized that bank foreclosure behavior would be changed by the passage of the 86 TRA. To test these hypotheses, he regressed net loans charged off against the type of bank, state located, size of bank (large or small), demand deposits, return on assets, net interest spread, securities gains or losses, and annual regional retail sales.

Weld (1991, 26) found that the regulation variable and the economic variable were so highly correlated as to make the economic variable expendable. Only return on assets and the state variable for Louisiana were significant, even though the model explained 56 percent of the variation in loan losses.

Weld used Chow tests on the 167 banks that comprised the sample to determine whether small banks and large banks changed their behavior because of 86 TRA. He failed

to reject the hypothesis of no difference in behavior for either large or small banks due to the passage of the 86 TRA (30).

Originally, the 86 TRA required large banks to use the specific write-off method which allowed a tax deduction for a bad debt only in the year the loss occurred. A controversial aspect of this recognition was that regulators allowed banks to recognize the loss if examiners ordered or would have ordered the write-off. Congress recognized the dilemma and modified the 86 TRA with IRC Section 166 which O'Donnell and Mastrangeli (1992, 17) summarized as "debt charged-off for regulatory purposes is conclusively presumed to have become worthless for tax purposes the same year." This change in regulation resolved conflicts between the IRS and the OCC.

To summarize, the 86 TRA has had a major effect upon the way that banks determine loan losses for tax purposes. Previous methods have been disallowed for large banks and other banks who belong to large holding companies. This difference in tax treatment for banks based on size is a major area of interest in the current research.

Loan Classification Methods

The next area of literature to be explored was that of loan classification. Banks and bank examiners typically rank loans based upon the assessed probability of default. Wu (1969, 704-5) stated that loan classifications are good predictors of loan write-offs.

The classifying of loans by degrees of risk is practiced extensively in banking and bank literature. In performing this task, bank examiners are following the classification system recommended by the OCC.[18]

Dietrich and Kaplan (1982, 18-19) report that "estimates of default risk facilitate the internal evaluation and review of lending operations and help to determine loan loss reserves for financial reporting." They further state that this classification is performed "by loan officers, auditors, and bank examiners."

In an attempt to address the limitations of Bentson's study, Marlin (1968) is reported by Benston and Marlin (1974, 36) to have replicated this study by using a stratified sample of banks of all sizes, types, and geographical locations for a four-year period (1963-1966). The most significant finding of this study was the negative relationship between substandard loan ratio (SLR) and bank size. Three explanations were formulated for this finding. The first noted that small banks loaned a greater percentage of their assets to small borrowers who generally are riskier clients. Another explanation is that small banks are unable to diversify their investment portfolio geographically and are thus at more risk from local economic conditions. The third explanation given concerned the cutoff level in the examination process.

Wojnilower (1962, 37) performed a descriptive study into the quality of bank loans using a sample consisting of 60 state member banks of all sizes from New York, Philadelphia, and Atlanta for a 10-year span between 1947-1957. He concluded that there

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[18]The Comptroller's Handbook of Examination Procedure (1978) lists 3 "classified" loan categories: Substandard, Doubtful, and Loss.

are varying degrees of risk associated with bank lending depending upon industry differences and size. In addition, he credited changes in the economy for much of the loan loss by stating:

> Even if all of a bank's customers have superior credit ratings now, that bank may still be incurring above-normal risks if these borrowers happen to be concentrated in lines of business that are particularly vulnerable to cyclical adversity.

In summary, loan classification methods have been used to allow managers to quantify default risk by grouping similar loans. Many researchers in the classification area have contributed variables of interest to the current topic of study. Dietrich and Kaplan (1982) stated that bank officers, auditors and examiners function to establish loan classifications. Marlin's (1968) finding on size reinforced the size effect under study. He also found that local economic conditions were significant. Wojnilower (1962) found a relationship between size and risk in banks.

The next area to be examined is governmental regulation of allowance for loan losses. Regulatory accounting practices (RAP) established by the Comptroller of the Currency and the FDIC are binding on national banks. These practices differ in the recognition of loan losses from those established for tax purposes. This area will explore this difference and its implications on loan loss determination.

Governmental Regulation of ALL

Conway and Siegenthaler (1987, 5) reported that use of loan loss reserves began with the passage of the Revenue Act of 1921. This law was written to allow bad debt expense to become a deduction to income after the passage of the Sixteenth Amendment

to the Constitution in 1913. The 1921 Act allowed banks to deduct bad debt expenses above actual losses for tax purposes. The excess expense was added to a reserve account to cushion future bank operations against excessive losses. Due to inadequate Internal Revenue guidelines about the definition of "reasonableness" (a concept that capped the reserve for loan losses), most banks continued to use the simpler direct charge-off method.

Conway and Siegenthaler (1987, 5-6) also stated that tax incentives were given to banks to establish reserves in 1947 and 1954. The Treasury Department established guidelines to help determine the proper amount to recognize as loss for tax purposes. Banks were allowed to recognize three times their loss experience over a 20-year period since 1927.

Banks were not required by generally accepted accounting principles to deduct loan losses from operating income during this period. Only after passage of the Tax Reform Act of 1969 were banks required to flow loan losses through the reserve account and be included in the operating statement. Minimums were also set for additions to the reserve account.

The 86 TRA changed the manner in which large banks and LHC banks with more than $500 Million in total assets were required to recognize loan losses. Previous deductions were now required to be recaptured.

In addition, new loan losses could be charged off to loss only as they occurred. This method was modified with the passage of IRC 166 which allowed banks to deduct for tax purposes any loans which regulators had ordered charged off for regulatory purposes.

On May 31, 1985, the OCC issued Banking Circular 201 (1985, 1) which addresses the Allowance for Loan and Lease Losses. As part of this circular, the OCC directed that "The ALL must be maintained at a level sufficient to absorb the loss inherent in the loan portfolio."

In 1992, the OCC modified Banking Circular 201 (1992, 4) by stating that only the "unconfirmed losses that may arise from events that have not yet occurred" be reflected by the chosen methodology. In addition, the suggestion was made that banks should "review and adjust historical loss rates for the above factors on a pool-by-pool basis."

RAP has traditionally determined loan losses. Lately, GAAP has become increasingly important in bank accounting. The final section addresses GAAP for loan loss recognition in banking.

GAAP Recognition of ALL

The AICPA has also been engaged in policy formation for loan loss determination. The Banking Committee of the AICPA (1968, 1983, 1992) has written procedural manuals for auditors engaged in examining banks. The Committee stated that "for purposes of expressing an opinion on the financial statements, the CPA must be concerned with the amount at which loans are stated in the aggregate" (65). In addition, they stated:

> The audit procedures should be designed to determine the overall collectibility of the entire portfolio and should be performed primarily on a test basis . . . the CPA should consider the composition of the loan portfolio, growth trends being experienced, unspecific loan classifications, previous loss and recovery experience, management's procedures for loan review and classification, and subjective factors, such as economic and environmental conditions (63).

The AICPA Banking Committee (1986) has also issued an audit procedure study for credit losses of banks. In this study, the Committee stated:

> Management's considerations should include such factors as changes in the nature and volume of the portfolio, overall portfolio quality, loan concentrations, trends in the level of delinquent and classified loans, specific problem loans, and current and anticipated economic conditions that may affect the borrower's ability to pay (13).

The Committee further stated that in establishing the scope of the work to be performed, the CPA *normally* (emphasis mine) considers the following factors:

(1) Composition of the loan portfolio;
(2) Identified potential problem loans, including loans classified by bank regulatory agencies;
(3) Trends in loan volume by major categories, especially categories experiencing rapid growth, and in delinquencies, nonaccrual, and restructured loans;
(4) Previous loss and recovery experience, including timeliness of charge-offs;
(5) Concentrations of loans to individuals and their related interests, industries, and geographic regions;
(6) Size of individual credit exposures (few, large loans versus numerous, small loans);
(7) Degree of reliance placed on internal loan review and internal audit functions;
(8) Total amount of loans and problem loans, including delinquent and nonaccrual loans, by officer;
(9) Lending, charge-off, collection, and recovery policies and procedures;
(10) Local, national, and international economic and environmental conditions;
(11) Experience, competence, and depth of lending management and staff;
(12) Results of regulatory examinations; and
(13) Related party lending (29).

In summary, RAP and tax regulations were effectively reconciled with the passage of IRC 166 which stated that losses recognized due to regulatory examination were determined to be recognized for tax purposes as well. In addition, the AICPA concurred with RAP. In the AICPA audit guide for auditing the ALL, a normative model was described which was the foundation for the current research. Much of this model comes

from prior research in previously discussed areas. This normative model was used as a template for the model used in the research project being constructed.

This discussion of governmental policy procedures on loan losses concludes the literature review. Chapter III provides a discussion of the procedures performed for the development of a model that explains loan losses in National Banks. This model will be tested using Analysis of Covariance to determine potential differences in loan losses due to regulation and size. The variables identified in Chapter II provided the basis for the development of this model.

CHAPTER III

RESEARCH DESIGN

As stated in Chapter I, one purpose of this research was to explore the relationships between the variables suggested by the AICPA and net loan losses. The normative model constructed by the AICPA implies that all banks are affected universally by the same set of variables. If this assumption is incorrect, auditors may improve their efficiency and effectiveness by examining other variables. Jeffrey, Norris, and Witowski (1992, 20-21) reported that "when performing a bank audit, the independent audit firm spends between 25-50 percent of the audit time on loan evaluation and the estimation of the Allowance for Credit Losses." To increase audit efficiency and effectiveness, more knowledge about how these variables interact in the determination of loan losses would be helpful. Auditors could increase efficiency by examining only those variables useful in explaining loan losses for the particular size bank or holding company being audited. If other variables are not being examined that could explain loan losses, auditors might be losing effectiveness and thereby increasing their liability.

The procedures used by this researcher in the attempt to accomplish these objectives are explained in this chapter. The following topics will be discussed in the

remainder of this chapter: Hypotheses, Sources of Data, Variables Used as Part of the Normative Model, and the Empirical Methodology.

Hypotheses

Research questions raised in Chapter I are restated as research hypotheses in the following section to determine whether differences in loan losses exist due to size and/or regulation effects.

Need for Additional Guidance Concerning Size

An initial purpose was to determine if loan loss determination was altered by bank size in the presence of the AICPA model. Size has been established to be a significant modifier of models in both financial and accounting studies.[19] In the banking environment, the capitalization ratio and loan portfolio potential are determined by bank size.

In addition, several studies have suggested that bank size has determined risk preference because of regulatory body policy interference, i.e., the "too big to fail" policy.[20] This policy was established by the Comptroller of the Currency in a speech to Congress in which he articulated the concept that a select number of large banks (originally eleven) would not be allowed to fail because of the contagion effects that their failure would have on the national banking system. Boyd and Gertler (1994, 2) reported that large banks have been insulated from their loan losses by this action and have taken greater

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[19]See Boyd & Gertler (1994) for a discussion of size in banking,

[20]Especially Samolyk (1994), Read, Bartsch, and Raghunandan (1994), and Demsetz and Strahan (1995).

risks as a result. The AICPA did not address the issue of whether bank size should be a factor in determining loan losses. This issue needed to be addressed because of the lack of authoritative guidance.

Size Effect Hypotheses: Within LHC's.

1Ho: Bank size as part of the AICPA model does not help differentiate small and medium LHC member banks as to loan loss determination.

1Ha: Bank size as part of the AICPA model differentiates small and medium LHC member banks as to loan loss determination.

Size Effect Hypotheses: Within SHC's.

2Ho: Bank size as part of the AICPA model does not help differentiate small and medium SHC member banks as to loan loss determination.

2Ha: Bank size as part of the AICPA model differentiates small and medium SHC member banks as to loan loss determination.

Need for Additional Guidance Concerning Scale

A second purpose of this study was to examine whether size in banking creates an economy of scale. Contradictory results have been obtained from previous research. Berger, Hanweck, and Humphrey (1987, 515) found modest economies of scale in small banks. Clark and Speaker (1994, 23) reported economies of scale in banks up to a billion dollars in assets. Jagtiani and Khanthavit (1996, 1285-6) found that after 1990, diseconomies of scale existed in large banks.

Divergent research results make further investigation into "economies of scale" desirable. Research utilizing loan losses may provide some new insights in this area. Since

no research has been discovered that utilized loan losses as a proxy for economy of scale, a need for guidance is perceived.

Scale Hypotheses: Within LHC's.

3Ho: Loan losses are the same for small and medium LHC member banks.

3Ha1: Loan losses are more in small LHC member banks than in medium LHC member banks.

3Ha2: Loan losses are less in small LHC member banks than in medium LHC member banks.

Scale Hypotheses: Within SHC's.

4Ho: Loan losses are the same for small and medium SHC member banks.

4Ha1: Loan losses are more in small SHC member banks than in medium SHC member banks.

4Ha2: Loan losses are less in small SHC member banks than in medium SHC member banks.

Need for Additional Guidance Concerning Regulation

Another purpose of this study was to examine whether loan losses in national banks could be explained more fully by incorporating an audit requirement in addition to the AICPA model. Since the audit function examines the timing of loan loss recognition, audited banks should have less latitude in determining the recognition period for the loss. Both the 86 TRA and the 91 FDIC Improvement Act made provisions for audit requirements based on size and holding company affiliation that affect the way banks recognize loan losses. Because the Banking Committee did not investigate this area, the

issue needs examination to determine if modification of the normative model is required to include the effect of audit regulation.

Regulation Effect Hypotheses:
Small Banks.

5Ho: Audit regulation as part of the AICPA model does not help differentiate small LHC and small SHC member banks.

5Ha: There is another model which includes regulation requiring an audit that differentiates loan losses for small LHC member banks from small SHC member banks.

Regulation Effect Hypotheses:
Medium Banks.

6Ho: Audit regulation as part of the AICPA model does not help differentiate medium LHC and medium SHC member banks.

6Ha: There is another model which includes regulation requiring an audit that differentiates loan losses for medium LHC member banks from medium SHC member banks.

Need for Additional Guidance Concerning
Interaction of Regulation and Size

When using a dual factor analysis of variance (of which ANCOVA is an extension), the first item to test is the interaction of the two factors. Hatcher and Stepanski (1994, 249) reported that in nonexperimental research "an interaction is a condition in which the relationship between one predictor variable and the criterion is different at different levels of the second predictor variable." As a result, if an interaction is present in single factor models, only simple effects can be tested.

Interaction Hypotheses:
Small LHC and Medium
SHC Banks.

7Ho: Audit regulation and size do not interact as part of the AICPA model to differentiate small LHC and medium SHC member banks.

7Ha: There is another model which includes bank size and regulation requiring an audit that differentiates loan losses in small LHC and medium SHC member banks.

Interaction Hypotheses:
Small SHC and Medium
LHC Banks.

8Ho: Audit regulation and size do not interact as part of the AICPA model to differentiate small SHC and medium LHC member banks.

8Ha: There is another model which includes bank size and regulation requiring an audit that differentiates loan losses in medium LHC and small SHC member banks.

Sources of Data

The data were collected from five sources. Population selection was made by compiling the bank holding companies listed by both Moody's Bank and Finance Journal and Compact Disclosure database. Further analysis was performed using these two sources to determine the banks held by these holding companies. Refinement of the population was made by referencing both the Sheshunoff's Bank Quarterly: Ratings & Analysis Journal and Polk's Bank Directory. Financial data for the variables of the selected sample of banks were derived from the Sheshunoff's Bank Quarterly: Ratings & Analysis Journal (1990-1994) and from LABSTAT, the Bureau of Labor Statistics database. The following portion of this paper will discuss additional procedures for selecting population,

sample, and variables, as well as the empirical and statistical methods employed in the analysis of the data.

Population Selection

National charter commercial banks of both small and medium size banks were chosen as the population of interest. National banks are the most heavily regulated type of institution, being supervised by the U.S. Comptroller of the Currency (OCC), the Federal Reserve, as well as the FDIC. National charter banks usually have annual examinations by OCC examiners.

A bank examination consists of assuring that banks are in compliance with regulations imposed by the regulatory agency (i.e., Federal Reserve, OCC, state banking boards, etc.) as well as the FDIC, the bank's insurance agent. Customarily, the Federal Reserve and FDIC depend upon the OCC examination and therefore rarely examine national banks.

When a problem bank is recognized, the FDIC can intervene to issue cease and desist orders, change managers, or close the bank. With such close scrutiny of national banks, the probability of income smoothing by manipulating the ALL is diminished. In addition, DeFond and Jiambalvo (1991, 653) reported that firms with audit committees are less likely to manipulate earnings, a form of income smoothing.

Lapidus (1980, 2) stated that in contrast to national banks, state Federal Reserve member banks are subject to examination by both state bank examiners, as well as annual examinations by the Federal Reserve. Conversely, state chartered nonmember banks are

examined by the FDIC and state examiners. Since each agency has different capital requirements and loan write off determinations, there is a difference between state and national banks that could confound the study. Therefore, state banks were not included in the population.

The population of national banks was then subdivided into two areas to be studied: those belonging to LHCs and those belonging to SHCs. Banks affiliated with the LHCs and SHCs were identified by accessing Compact Disclosure. During the search process, these banks were further defined as being either small or medium. Large banks were not included in the study because of the differences in lending practices. One of these practices is the lending of large sums to foreign countries. Since this type of loan carries with it a high default rate, inclusion of this size of institution might have introduced bias into the study. Missing observations from Compact Disclosure were identified using Moody's Bank and Finance Manual, as well as Polk's Bank Directory.

Sample Data

Two hundred and thirty-six banks were randomly selected from LHC's and SHC's. These banks were further divided by size into medium and small banks. The sample data for the selected banks were taken from two sources. Quarterly financial data were selected from Sheshunoff's The Bank Quarterly Ratings. Economic data was downloaded from the Bureau of Labor Statistics database: LABSTAT.

Variables for Selected Banks

Variables used to test all listed hypotheses were collected for the two classes of national banks: LHC member and SHC member. In addition, these two classes of holding companies were further divided into two partitions in each class: small and medium bank size. Small banks were defined as having less than $100 million in total assets over the three-year period of study. Medium banks were defined as having at least $100 million, but no more than $500 million in total assets during the study period. This research area has had incongruent results previously because researchers have not defined a consistent standard size for small, medium, and large banks.

Dependent Variable

The dependent variable Net Charge-Offs (NCO) was the actual loan losses incurred by the selected banks. These loan losses were measured as the quarterly charge-offs minus any recoveries. In addition, the losses were reported as a percentage of average loans to eliminate the size effect.

Moore (1992, 42) chose not to use actual loan losses in his study. His reasoning was that some banks write off problem loans immediately while others carry them as nonperforming. To correct for this, he added the total loan write-offs to the total nonperforming loans, subtracted the recoveries, and divided the results by total loans. Since all nonperforming loans are required by examiners to be expensed eventually, NCO was determined to be a more appropriate dependent variable than the one used by Moore.

Independent Variables Suggested by the AICPA

The first factor suggested by the AICPA Banking Committee was the Composition of the Loan Portfolio. This factor is actually a measure of the non-systemic risk that a bank accepts when investing in monetary lending. Copeland and Weston (1988, 198) defined non-systemic risk as a measure of covariance between returns on the investment and the market portfolio. Fama (1976), Sharpe (1964), and other financial theorists contended that financial analysts reduce non-systemic risk by diversifying the loan portfolio. Since market changes affect different businesses in various ways, bankers diversify their loan portfolio by lending across a wide spectrum of business types, so that market changes will have less effect on loan losses. Lyons (1994, 36) reported that:

> By increasing the number of borrowers in a loan portfolio, management reduces the importance of any single borrower to the loan portfolio and therefore, the potential impact of loan loss from a single borrower on that portfolio.

The loan portfolio factor was measured by four levels represented by the principal loan types made by banks. To control for size, each of the variables was divided by total assets. The four levels of loans were (1) construction loans, (2) commercial real estate, (3) consumer loans, and (4) agricultural loans.

In addition, this factor also measured the concentration of loans to related interests, industries and geographic areas, since banks largely loan within their customers' area (disregarding participating loans). The principal purpose of this factor was to capture the quality of the loan portfolio diversification for each bank.

The second factor studied is Trends in Loan Volume and in Delinquencies. This factor is a trend variable that measures the changes in loan concentration and the effect of the changes on loan losses from period to period. In effect, this factor is the constant change in portfolio mix that Foster (1986, 312) suggested should occur due to different risk assessments (changes in beta)[21] which occur in the market over time.

This factor was measured by four variables which reflected the changes in loan concentration in each of the four principal loan categories and one variable that reflected changes in delinquencies. Each loan concentration variable was quantified as being the percentage change in loans in that category controlled for size by dividing by the change in total assets. The four loan concentration levels were (1) change in construction loans, (2) change in commercial real estate, (3) change in consumer loans, and (4) change in agricultural loans. The delinquency component was measured by the change in nonaccrual loans as a percentage of gross loans.

The third factor addressed was a composite of Potential Problem Loans and Results of Regulatory Examination, two areas the AICPA suggests as being normally audited. Potential Problem Loans are defined by Sheshunoff (1994, 2-6) as a measure of asset quality which reflects "a bank's ability to make and collect loans. Nonaccrual loans are a Result of Regulatory Examination. Examinations may result in potentially bad loans being classified as "substandard," "doubtful," or "loss." Loss classifications result in direct charge-offs, while "doubtful" may result in a nonaccrual classification.

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[21]Beta is a finance term which measures the risk of individual assets of a portfolio to the entire market.

This classification factor was measured by nonaccrual loans. This factor was quantified as nonaccrual loans and leases and was controlled for size by dividing by the gross loans.

The next factor included in the AICPA model is Economic Conditions. Graham and Horner (1988, 10) found that "an adverse economy was a significant factor in 35 percent of the (bank) failures." This factor should be a three level factor due to national, international, and local economic effects on loan losses. National effects should be measured by the loan concentration variables and thus would be redundant to the study in the aggregate. In other words, the national economic effect will be eliminated by randomization. International economic effects occur mainly in large banks that lend on the international markets. Large banks were eliminated from the study because of the confounding effect that these foreign loans might have upon the study.

The local economic effect was the only factor that was addressed. Ford (1994, 25) reported that "changes in annual failure rates reflect variations in general economic conditions and correlated closely with changes in other measures of economic health such as the unemployment rate and gross domestic product." In addition, Hooks (1992, 1-2) found that employment in Texas and Louisiana mirrored bank profitability during the 1980s.

This factor level was measured by the local county unemployment rate. The data were obtained from the National Bureau of Labor Statistics (NBLS) database, LABSTAT. The NBLS began the collection of County level unemployment data in 1990.

The fifth factor studied was the Experience, Competence & Depth of Management. As loan officers become more experienced and more competent in their evaluation of loan applications, the number of "bad" loans made should decrease with a corresponding decrease in loan losses. Graham and Horner (1988, 8) in a study sponsored by the OCC found that ". . . the policies and procedures of a bank's management and board of directors have the greater influence on whether a bank will succeed or not."

Spadaford (1988, 21-22) identified poor asset management as one of the causal factors leading to bank failure. Boffey and Robson (1995, 66) further expounded on this idea by stating:

> A key reason why the correct management of credit risk is so important is because banks have such a limited capacity to absorb loan losses . . . The low risk-low marginnature of banking business is something that has been written about for some time.

This single level factor was measured by the President's weighting, an indirect management measure suggested by Sheshunoff's rating analysis. Sheshunoff (1994, II.3) calculated the scores for this measure by using weights obtained from a survey of bank presidents. The presidents were asked to estimate the percentage weight of importance for each of the CAMEL[22] areas. The weights for all areas except management were then multiplied by four which yielded a weighted base. These bases were then standardized by rank and their total rank scores summed to yield a weighted total score. Comparison of this weighted total score versus a percentile curve determined the final weights. The scale of this variable was from 0 to 99, with 99 being considered the best.

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[22]CAMEL is an acronym which represents (1)Capital adequacy, (2)Asset quality, (3)Management, (4)Earnings, and (5)Liquidity. CAMEL ratings are a common bank rating measure.

A similar variable suggested by the AICPA indicates the need to study Loan Losses as a Function of the Loans made by each Individual Loan Officer. While this variable might be appropriate for an individual bank in determining effectiveness of loan officers, implementation in an aggregate model would be difficult because of the inability to collect proprietary data.

Another variable examined was that of Previous Loss and Recovery Experience. The AICPA Committee on Banking (1992, 63-4) suggests that past losses are indicative of the risk preference of the lending institutions. In addition, recoveries illustrate how well loan officers recognize and remedy problem loans. This variable was measured by lagging the net loan loss by one period.

Four additional variables suggested by the AICPA Banking Committee (1992, 64-5) as being pertinent to the ALL audit, but not included in the study, were (1) Size of Individual Credit Exposures, (2) Related Party Transactions, (3) Degree of Reliance placed on Internal Loan Review and Internal Audit Functions, and (4) Lending, Charge-off, Collection, and Recovery Policies and Procedures. All four variables are easily seen to be bank specific and thus are not useful for an aggregate decision. These four variables were not included in the model because of this limitation.

Independent Variables Suggested by Other Research

Two variables suggested by the Auditing Principles Board as being important to internal controls structures are size and regulation. Neither was examined by the AICPA Banking Committee. In addition, econometric modeling often inadvertently omits

variables. To test for this, a trend variable is included to absorb the random error of omitted variables. These variables are introduced in the following sections.

Regulation. The banking industry has been considered one of the most heavily regulated in the United States. While this situation was attenuated partially by the bank reform acts passed in the late 1970s and early 1980s, the industry continues to have enormous regulatory supervision. One aspect of this regulation pertinent to this research is the requirement by the OCC that national banks over $500 million in assets or whose holding company has more than $500 million in assets submit to an annual external audit each year.

In earlier research, Amos (1992, 810) found that regulatory changes did not cause bank closings during the 1980s, but suggested that data for later years might need to be examined. Hollingsworth and Rose (1995, 27) extended the research of regulation effect in banking and determined that the 86 TRA was linked to changes in bank asset quality during the late 1980s.

This research extends the study of regulation by an examination of the effects of OCC rulings and 86 TRA enactments on loan losses of LHC member banks. These banks were hypothesized to have been affected by the rulings and regulation which requires these banks to submit to an annual external audit. The SHC member banks were hypothesized not to be impacted since they were not required to be audited. Large banks of more than $500 million in assets were specifically excluded from the study due to the confounding differences in operations between small and medium banks and those of large banks.

Size. Another area of interest in banking is the impact of size on bank efficiency. Do banks become more efficient as they grow larger? The existence of an economy of scale in banking has continued to elude researchers. Samolyk (1994, 2) reported that "the phenomenon of bank holding companies emerged in the 1950s and 1960s as a response to restrictions on the scale and scope of banking activities."

Boyd and Gertler (1994) hypothesized that large banks were responsible for the poor performance of the industry during the 1980s. They attributed this to two factors: "deregulation and financial innovation led to increased overall competition for the banking industry" and "the existing regulatory environment tended to subsidize risk-taking by large banks more than that by small banks" (2). They concluded that even "after regional conditions are controlled for, size still matters in explaining loan losses" (3). In addition, they contend that "generally speaking, smaller banks adopt more conservative asset and liability positions than do large banks" (8). They advanced the scale controversy by concluding that the smallest banks (under $50 million in assets) performed poorly because of an inability to utilize scale economies (21).

Samolyk (1994, 3) reported that "differences in banking conditions also appear to be associated with bank size and holding company affiliation." In contrast to Boyd and Gertler, she found that "relatively small banks ($100 million to $500 million in assets, 1987 dollars) seem to have turned in the best performance in terms of profitability and asset quality" (14).

Demsetz and Strahan (1995, 23) validate Samolyk's findings in an indirect manner. In their study based on small and large holding companies, they found that after 1991 an

inverse relationship between size and risk began to be statistically significant in holding company banks. They concluded that "changes in the regulatory climate could explain changes in the relationship between size and risk." This relationship explains Samolyk's (1994, 16) finding that smaller banks outperformed larger banks in this period due to the existence of a direct relationship between risk and return.

Trend. In any econometric model, the omission of a relevant variable causes biased estimates of the coefficients which precludes the use of standard tests of significance. If this omitted variable exhibits trends over time, Johnson, Johnson, and Buse (1987, 357) state that the preferred methodology is to introduce a trend variable which "picks up the effect of these omitted variables and thereby reduces the potential bias in the coefficients of the other variables included in the equation." They elaborate by stating the trend variable "detrends" the data such that "the coefficients of the other variables in the equation will be explaining not changes in the level of the dependent variable, but instead explaining deviations of the dependent variable from its trend value."

To incorporate the methodology of Johnson, Johnson, and Buse (1987, 357), the model was expanded to include a trend variable. This variable was defined to reflect the quarter and year in which the data originated. A statistically significant trend variable will reduce bias, but may indicate that an important relevant variable has been omitted from the data set.

Empirical Methodology

This section describes the statistical procedures used to analyze the hypotheses elaborated in the first section of this chapter. Statistical procedures were performed using SAS/STAT.[23]

The Analysis of Covariance Model

$$Y = \mu + \alpha + \beta + D\alpha\beta_1 + \Sigma\beta(X-\bar{x}) + \epsilon$$

Y	=	NET CHARGE-OFFS RECOGNIZED
μ	=	GRAND MEAN
α	=	TWO LEVEL FACTOR REPRESENTING BANK SIZE, SMALL AND MEDIUM
β	=	TWO LEVEL FACTOR REPRESENTING HOLDING COMPANY AFFILIATION
$D\alpha\beta_1$	=	INTERACTION OF SIZE AND HOLDING COMPANY AFFILIATION
ϵ	=	RANDOM ERROR

Analysis of Covariance

The statistical method chosen to analyze the research area was analysis of covariance (ANCOVA). Puri and Sen (1969) and Quade (1967) reported that ANCOVA functioned by measuring the effect of a class or classes of variables on the dependent variable in conjunction with a number of covariates. Wildt and Ahtola (1978, 9) stated in the regression perspective case where the covariates and categorical independent variables are of equal interest "the researcher may wish to examine the effect or contribution of each independent variable (both quantitative and qualitative), after adjusting or correcting for

[23]SAS/STAT is a registered trademark for statistical software marketed by SAS Institute Inc.

the effects of all other independent variables." Since the research question at hand asked how bank size and/or regulation affected loan losses as part of an existing model, ANCOVA appeared to be the most appropriate tool for this task.[24]

Wildt and Ahtola (1978, 7-9) stated that among its uses is that of performing a type of regression analysis which controls for categorical variables when examining the relationship between two or more quantitative variables.

Tests of ANCOVA Assumptions. When performing exploratory research, assumptions made about a population distribution may prove to be erroneous and thus cause a selected methodology to be inappropriate for a preselected statistical test. Winer, Brown and Michels (1991, 764-5) stated that the assumptions required for ANCOVA to produce reliable results are (1) normal distribution of the error term, (2) independent distribution of the error term (homoscadasticity), and (3) homogeneity of the within-class regression coefficients. The following sections will discuss the tests which determine the validity of these assumptions.

Test of Normality. Normality of distribution must be examined to determine the appropriate statistical procedure to use for hypothesis testing. A Kolmogorov-Smirnov (K-S) test on the data was conducted to explore the distribution of the data. The K-S statistic, an output of the SAS Univariate procedure, is a common measure of univariate normality. The null hypothesis for a normal distribution must be rejected if the p value for

[24]ANCOVA is a statistical tool used to examine relationships between at least two quantitative variables and at least one qualitative variable.

this statistic is less than .05. The *p* value for the K-S test on the data was .01, which indicated a nonnormally distributed sample.

Ranked Transformations. Nonnormally distributed data can lead to incorrect conclusions in inferential statistical analyses and may bias the correlation coefficients. Conover (1980, 337) suggested the use of rank transformation as one way to correct for this defect. To perform this operation, he suggested ranking all the observations from smallest to largest and then applying the usual analysis of variance to the ranks. Conover and Iman (1981, 124) further contended that this procedure[25] yields a distribution free procedure that "results in a class of nonparametric methods that includes the Wilcoxon-Mann-Whitney test, the Kruskal-Wallis test, the Wilcoxon signed ranks test, the Friedman test, Spearman's rho, and others."

Conover (1980, 337) suggested that the use of rank transformations could mitigate the damage caused by the nonnormality. He stated that "in experimental designs for which no nonparametric test exists . . . to use the usual analysis of variance on the data and then to use the same procedure on the rank transformed data." He further contended that "when the two procedures give substantially different results, the analysis on ranks is probably more accurate than the analysis on the data and should be preferred."

[25]The SAS/STAT User's Guide (1989, 27) concurred with this approach stating that "most nonparametric methods are based on taking the ranks and analyzing these ranks (or transformations of them) instead of the original values."

Comparisons of the two procedures yielded a relatively large difference between the ranked and unranked data with several variables changing significance.[26] (See Appendices II and III.) Therefore, the rank transformation of the data was considered preferable. Conover (1980, 337) stated that it yields:

> A procedure that is only conditionally distribution free . . . it is robust, which means that the true level of significance is usually fairly close to the approximate level of significance used in the test, no matter what the underlying population distribution might be.

Test for Homoscedasticity. The second assumption usually required for ANCOVA is independent distribution of the error term (homoscedasticity). A test for this condition was performed using Proc Reg with the Spec option. Results of this test indicated that the sample had heteroscedastic tendencies.

Test for Homogeneity of Internal Regressions. The third assumption commonly attributed to ANCOVA is homogeneity of internal regressions, which requires the regression coefficients to be constant between the different classes. Winer, Brown, and Michels (1991, 765) related that:

> With regard to the homogeneity of the within-class regression coefficients, if assignment of units to treatments is random and the treatments do not affect the covariate, one expects that assumption to be met. If intact groups are assigned to the treatments, there may possibly be heterogenetity of internal regression.

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[26]In following Conover's method, the data were ranked smallest to largest using SAS Proc Rank. This procedure was followed by ANCOVA, as utilized by SAS Proc GLM.

In the present study, the treatments were the class variables of size and regulation. Since the effect of treatments on covariates could not be ruled out, the assumption of homogeneity of internal regressions could not be met.

Littell, Freund, and Spector (1991, 243) stated that a lack of homogeneity "reflect[s] an interaction between the treatment groups and the independent variables or covariates." This interaction causes the intersection of the internal regression lines. The effect of this intersection results in the decomposition of the ANCOVA model.

Several methods have been utilized by different researchers to examine this interaction effect. The methodology selected to test for the presence of heterogeneity followed the suggestion of Littell, Freund, and Spector (1991) to regress loan losses on interactions of covariate and class variables as additions to the regression equation. If these interaction terms are determined to be statistically significant, then the slopes of the internal regression lines for the class variable and the covariate have different values which cause the lines to intersect.

The data were tested for homogeneity of internal regressions by constructing interaction terms for all potential class-covariate combinations. These combinations were then inserted into the regression of loan losses on the bank size, regulation, and the 14 covariate variables. The results of that investigation are illustrated in Table I for regulation effects and in Table II for bank size effects.

TABLE I
REGULATION AND COVARIATE INTERACTION

Parameter	F value	PR > F
Regulation*Construction Loans	1.18	0.2764
Regulation*Real Estate Loans	0.44	0.5093
Regulation*Consumer Loans	1.07	0.3007
Regulation*Agriculture Loans	**11.20**	**0.0008**
Regulation*Previous Loss Experience	**10.41**	**0.0013**
Regulation*Problem Loans	0.07	0.7896
Regulation*Economic Conditions	0.55	0.4597
Regulation*Management Quality	**8.57**	**0.0034**
Regulation*Trend Variable	0.73	0.3921
Regulation*Changes in:		
Construction Loans	**4.48**	**0.0343**
Real Estate Loans	1.52	0.2177
Delinquent Loans	1.40	0.2375
Agriculture Loans	0.83	0.3632
Consumer Loans	2.71	0.0999

TABLE II
BANK SIZE AND COVARIATE INTERACTION

Parameter	F Value	PR > F
Bank Size*Construction Loans	0.23	0.6345
Bank Size*Real Estate Loans	0.31	0.5791
Bank Size*Consumer Loans	1.57	0.2096
Bank Size*Agriculture Loans	2.51	0.1133
Bank Size*Previous Loss Experience	1.60	0.2060
Bank Size*Problem Loans	0.14	0.7107
Bank Size*Economic Conditions	0.09	0.7640
Bank Size*Management Quality	1.45	0.2290
Bank Size*Trend Variable	0.00	0.9840
Bank Size*Changes in:		
Construction Loans	1.58	0.2085
Real Estate Loans	0.00	0.9894
Delinquent Loans	0.24	0.6244
Agriculture Loans	0.39	0.5313
Consumer Loans	0.14	0.7062

An examination of Table I reveals four variables that indicate a statistical relationship with regulation. The first variable that illustrates significance is the intersection of regulation and agriculture loans. Moore (1992) reported that agricultural loans helped explain loan losses in small banks. During the period of his study, he reported "agricultural stress was at its worst in 1986" (119). The perception is that agricultural loans were recognized as being impaired by the auditor(s) and written down accordingly.

The second statistically significant variable is the intersection of regulation and previous loss experience. Since auditors decide when banks will write off bad loans, the perception is that the timing of the loan write-off is associated with audit regulation.

The third variable of significance is the intersection of regulation and management quality. A significant part of an audit requires the auditor to evaluate personnel as part of

the internal control study. A possible explanation for the relationship between management quality and regulation might be that audited banks have higher quality personnel as a result of the audit.

The final significant variable is the intersection of regulation and changes in construction loans. During the period of study, 1991-1993, the US economy was in a deep recession. New construction loans were not being made and defaults on existing loans were common. A possible explanation for this relationship between changes in construction loans and regulation requiring audits is that the audits forced the recognition of the impairment of the construction loan.

Do these four heterogenous variables out of 28 prevent the usage of ANCOVA because of the presence of heterogeneity of variance? Joyce Lee Shields (1973, 29) stated:

> Results indicated that ANCOVA is robust to violations of assumptions of homoscedasticity and homogeneity of variance, both singly and in combination, when group sizes were equal.

Since the study was designed for a two by two block matrix with equal numbers of banks in each cell, the perception is that ANCOVA is robust to the slight appearance of heterogeneity of variance and heteroscedasticity.

In the next section, the statistical procedures will be introduced. This area will include the sample selection and time frame for the experiment, as well as sample size determination.

Applications of ANCOVA

ANCOVA has not been applied significantly in accounting research. Most applications have been used in marketing and managerial topics. McElroy, Morrow, Power, and Iqbal (1993, 374-7) applied ANCOVA to measuring the effect of commitment on insurance agents' perceptions, attitudes, and performance. Schnake, Cochran, and Dumler (1995, 215-7) used ANCOVA to measure organizational citizenship as a measure of job satisfaction. Brill (1994, 218) increased the statistical precision in measuring managerial opportunism.

Statistical Procedures

ANCOVA was performed upon selected sample banks to test the hypotheses concerning the determinants of loan losses in national banks. To allow multiple comparisons to be made, both within and between groups, the sample observations were selected randomly from each 10th percentile of the population by total asset size.

As the nonparametric procedure is asymptotic and requires large samples (i.e., >30 observations) to have reliable results, 60 observations from each of the subpopulation groups were selected randomly. One observation from each group had to be omitted due to changes in bank holding company affiliation that occurred during the study period. Previous researchers have used similar size samples.[27] This sample size also correlates with the central limit theorum. Cangelosi, Taylor and Rice (1983, 133-7) cited this

[27]Examples of sample size of previous research: Dhanani (1986) 22 banks, Altman (1968) 33 firms, Meyer and Pifer (1970) 30 banks, Baldwin and Glezen (1992) 40 firms, Yue (1992) 60 banks, Espahbodi (1991) 48 banks, and Wojnilower (1962) 60 banks.

theorum as stating that as a sample size approaches 30 observations, the distribution tends to become normally distributed.

For each of the 59 remaining banks from each group, observations were collected in quarterly increments for the variables discussed in the previous section for a period of three years between 1991 and 1993. Austin (1992, 38) reported that the normal operating cycle of a bank (issuance of loan to collection) is five years. The use of this ideal period was precluded because of the growth in bank size that resulted in too many banks changing size category over this number of years. Three years was determined to be the most practical period of time that could be utilized and still illustrate the problem.

Chapter III has presented the methodology used in the empirical analysis of determinants of bank loan losses. The variables defined by the AICPA as determining loan losses were enumerated as were two suggested additions: regulation and bank size. Hypotheses to be tested were presented. The population was defined as being small and medium size national banks held by large and small holding companies. Selection of the sample and collection of data were also discussed. Statistical procedures used for testing the distribution of the data were delininated. Analysis of covariance was selected as the statistical tool to perform hypotheses tests. The results of these hypotheses tests are presented in Chapter IV.

CHAPTER IV

RESULTS

The purpose of this chapter is to present the results of the empirical analyses of the study on determinants of loan losses in national banks. Results are divided into five major sections. Section one relates the findings of tests for interactive effects between regulation and size. Main effects of size and regulation cannot be determined until the presence or absence of interaction is determined.

The next section discloses the effects of bank regulation on loan losses, as measured by the requirement to be audited annually. Section three relates the statistical relationship of loan losses and bank size, which consists of small and medium national banks.

The fourth section consists of an examination into the economy of scale controversy in banking. As a summation, section five illustrates the association of loan losses and the covariates suggested by the AICPA Banking Committee.

Need for Additional Guidance Concerning Regulation and Size

This section presents the results of tests performed to determine whether loan losses are affected by bank regulation requiring financial audits and by size as measured

by total assets of national banks. Do size and regulation interact to affect loan losses in national banks? No previous research has been found that addressed this question. In conjunction with guidance for size and regulation main effects, guidance for interaction between these two areas needs to be addressed as well. The presence or absence of an interactive effect (see the Covariance Model on page 58) needs to be determined prior to testing for main effects.

To determine whether interaction of size and regulation occurs, 59 small LHC member banks were contrasted with 59 medium SHC member banks. In addition, 59 small SHC member banks were contrasted with 59 medium LHC member banks.

ANCOVA was performed on these comparisons to determine whether a statistically significant relationship existed between loan losses and the interaction of regulation and size for these two groups. The results of this analysis are shown in Table III.

TABLE III
TEST FOR INTERACTION BETWEEN SIZE AND REGULATION

Parameter	F Value	PR > F
Bank Size*Regulation	0.27	0.6026

Based upon this statistical analysis, the results fail to reject the null hypothesis of no statistical differences between group means. Therefore, the null hypothesis for interaction of size and regulation is accepted as follows:

7Ho: Audit regulation and size do not interact as part of the AICPA model to differentiate small LHC and medium SHC member banks.

8Ho: Audit regulation and size do not interact as part of the AICPA model to differentiate small SHC and medium LHC member banks.

Need for Additional Guidance Concerning Regulation

One area neglected by the AICPA has been the impact of regulation on bank determination of the ALL. In the current study, loan losses of national banks were examined to determine whether the loan loss recognition was affected by the external audit function, a type of bank regulation.

Fifty-nine small LHC member banks required by regulation to have annual independent audits were compared to 59 small SHC member banks that had no such regulation. The results of that comparison of least square loan losses are shown in Table IV.

TABLE IV
LOAN LOSSES IN SMALL SIZE BANKS
DUE TO REGULATION

Parameter	LS Means Loan Losses	Std. Err. Loan Losses
Small SHC Member Banks	1320.55234	28.88244
Small LHC Member Banks	1327.75368	28.93058

Fifty-nine medium LHC member banks required by regulation to submit to annual independent audits were compared to 59 medium SHC member banks that had no such

regulation. The results of that comparison of least square loan losses are shown in Table V.

TABLE V
LOAN LOSSES IN MEDIUM SIZE BANKS
DUE TO REGULATION

Parameter	LS Means Loan Losses	Std. Err. Loan Losses
Medium SHC Member Banks	1491.50110	28.47070
Medium LHC Member Banks	1527.60185	28.36672

ANCOVA was performed on the ranked data to determine whether a statistically significant relationship existed between loan losses, previously defined in the study as net charge-offs, and the two classes of national banks. The results of that analysis are shown in Table VI.

TABLE VI
PERCEPTION OF A NEED CONCERNING REGULATION
AS PART OF AICPA MODEL

Parameter	F Value	PR > F
Regulation	0.58	0.4458

Tables IV and V indicate differences in least square means between the two classes of banks exists. Table VI, however, clearly indicates that these differences are not statistically significant.

Based upon this statistical analysis, the results fail to reject the null hypotheses of no statistical differences between group means. Therefore, the null hypotheses for both small and medium banks are accepted as follows:

5Ho: Audit regulation as part of the AICPA model does not help differentiate small LHC and small SHC member banks.

6Ho: Audit regulation as part of the AICPA model does not help differentiate medium LHC and medium SHC member banks.

Need for Additional Guidance Concerning Size

An additional area left unexplored by the AICPA is the effect of bank size on loan losses. Previous studies have debated the existence of an economy of scale in banking. One purpose of this research was to determine whether size should be considered when auditing banks. To achieve that purpose, an "F" test was administered to the data. The holding company effect was held constant by comparisons within holding company size.

Fifty-nine small LHC member banks were compared to 59 medium LHC member banks. Results of the comparison of least square mean loan losses are exhibited in Table VII.

TABLE VII
LOAN LOSSES FOR SMALL & MEDIUM LHC MEMBER BANKS

Parameter	LS Means Loan Losses	Std. Err. Loan Losses
Small LHC Member Banks	1327.75368	28.93058
Medium LHC Member Banks	1527.60185	28.36672

Fifty-nine small SHC member banks also were compared to 59 medium SHC member banks. Results of the comparison of least square mean loan losses are exhibited in Table VIII.

TABLE VIII
LOAN LOSSES FOR SMALL & MEDIUM SHC MEMBER BANKS

Parameter	LS Means Loan Losses	Std. Err. Loan Losses
Small SHC Member Banks	1320.55234	28.88244
Medium SHC Member Banks	1491.50110	28.47070

ANCOVA was performed on the ranked data to determine whether a statistically significant relationship existed between loan losses and the two sizes of national banks. The results of the statistical analysis are shown on Table IX.

TABLE IX
PERCEPTION OF A NEED CONCERNING SIZE AS PART OF AICPA MODEL

Parameter	F Value	PR > F
Size	37.12	0.0001

Tables VII and VIII indicate differences in group means between the two sizes of banks exists. Table IX demonstrates the statistical significance of this difference.

As a result of this statistical analysis, the null hypotheses of no effect must be rejected. The resulting alternative hypotheses for small and medium banks are accepted as follows:

1Ha: Bank size as part of the AICPA model differentiates small and medium LHC member banks as to loan loss determination.

2Ha: Bank size as part of the AICPA model differentiates small and medium SHC member banks as to loan loss determination.

Need for Additional Guidance Concerning Scale

The inconsistent results from numerous research projects for determination of economy of scale in banking calls for additional guidance for this issue. Does increased size lead to efficiencies in loan departments that allow them to decrease the bank loan losses? The advent of the new information age of computers suggests that loan officers should have more and better information on customers. In theory, better lending decisions should be made that would decrease loan losses and create an economy of scale.

To determine whether an economy or a diseconomy of scale exists, a two-tailed *T test* was performed on the data. Holding company size was held constant to prevent confounding the decision. The results of that test for small holding companies may be seen in Table X.

TABLE X
ECONOMY OF SCALE HYPOTHESES:
WITHIN SHC'S

Parameter	LS Means Loan Losses	Std. Err. Loan Losses	Pr >T
Small SHC Member Banks	1320.55234	28.88244	
Medium SHC Member Banks	1491.50110	28.47070	.0001

From this test, the null hypothesis (4Ho) must be rejected. In addition, the first alternative hypothesis (4Ha1) of larger loan losses for small banks must be rejected. Therefore, the results are a failure to reject hypothesis (4Ha2) that loan losses are smaller in small SHC banks. The alternative hypothesis is accepted as follows:

4Ha2: Loan losses are less in small SHC member banks than in medium SHC member banks.

Economy of Scale Hypotheses Within LHC'S

An examination was also made into LHC banks to determine whether an economy or diseconomy of scale exists between small and medium banks in the large holding company environment. The results of that exam are exhibited in Table XI.

TABLE XI
ECONOMY OF SCALE HYPOTHESES:
WITHIN LHC's

Parameter Parameter	LS Means Loan Losses	Std.Err. Loan Losses	PR>T
Small LHC Member Banks	1327.75368	28.93058	
Medium LHC Member Banks	1527.60185	28.36672	.0001

From this test, both the null hypothesis (3Ho) and the first alternative hypothesis (3Ha1) of larger loan losses for small banks must be refuted. Therefore, the results are a failure to reject hypothesis (3Ha2) that loan losses are less in small SHC banks. This alternative hypothesis is accepted as follows:

3Ha2: Loan losses are less in small LHC member banks than in medium LHC member banks.

Need for Additional Guidance Concerning
the AICPA Model Variables

The AICPA has advanced a prescriptive model for auditors to follow when examining the allowance for loan losses of banks. Since this model has not been empirically tested, the statistical significance of the suggested variables have not been examined. In the current study, loan losses of national banks are examined to determine whether this prescriptive model can aid in differentiating between small and medium national banks, as well as between those banks required by regulation to be audited and those that are not.

Fifty-nine national banks from each of the four categories were compared to determine whether size, regulation, and the AICPA variables, used as covariates, could differentiate loan losses. ANCOVA was performed on the ranked data to determine whether a statistically significant relationship existed between loan losses and the covariate variables. The results of this analysis are shown in Table XII.

TABLE XII
AICPA MODEL USED AS COVARIATES

Parameter	F Value	PR < F
Construction Loans	1.01	0.3142
Real Estate Loans	0.00	0.9825
Consumer Loans	**5.38**	**0.0204**
Agricultural Loans	2.97	0.0849
Previous Loss Experience	**5.98**	**0.0145**
Problem Loans	**42.82**	**0.0001**
Economic Conditions	1.52	0.2184
Management Quality	**54.55**	**0.0001**
Trend Variable	**253.71**	**0.0001**
Changes in:		
Construction Loans	**7.39**	**0.0066**
Real Estate Loans	0.82	0.3652
Consumer Loans	**7.29**	**0.0070**
Agricultural Loans	0.29	0.5911
Delinquent Loans	**24.03**	**0.0001**

The results are that of the 14 covariates used in the model, only eight demonstrate statistical significance. Of these, seven were suggested by the AICPA Banking Committee. Consumer loans, previous loss experience, problem loans, management quality, and changes in construction loans, consumer loans, and delinquent loans all

demonstrated statistically significance at the .05 level. In addition, the trend variable also demonstrated a strong statistical significance.

In contrast, six other variables suggested by the Committee did not illustrate significance. Those variables not exhibiting significance were agricultural loans, construction loans, real estate loans, economic conditions, and changes in agricultural loans and real estate loans.

Another area of interest was the amount of the variance of loan losses explained by the AICPA model. When the thirteen model variables were regressed on loan losses, 13.8 percent of the variability was explained. All the variables but construction loans and changes in construction, real estate, and agricultural loans exhibited significance.

When the trend variable was introduced, the coefficient of one of the variables changed sign. This change usually indicates a mild case of multicollinearity.

By adding regulation and size to the model, the amount of explained variance was increased by 10 percent more than that explained by the AICPA model alone. Since trend variables cannot "explain" variance, the trend variable was not included in this calculation.

This chapter has presented the findings of this study. The following chapter, Chapter V, provides a summary of the study, conclusions drawn from the findings, and implications for future research.

CHAPTER V

SUMMARY, CONCLUSIONS, AND IMPLICATIONS FOR FUTURE RESEARCH

Recently, a significant number of banks have become insolvent. A major contributor to this trend has been the inability of the banks to collect outstanding loans. Frequently, external auditors of these failed institutions have been sued by investors and creditors. A major accusation of these litigations has been that auditors incorrectly determined the net realizable value of the loan portfolio. The major factor involved in this determination is the Allowance for Loan Losses (ALL).

Regulators from the Office of the Comptroller of the Currency and members of the Banking Committee from the AICPA have exhibited a keen interest in how the ALL is measured. Factors that influence loan losses, both internal and external, have been examined for possible significance. Models involving these factors have been suggested as areas of interest for auditors.

Statement of the Problem

In the auditing profession, performance of the audit must be performed both efficiently and effectively. If not efficient, the audit will come in "over budget" causing reduced net income to the audit firm and the potential for other difficulties. If not

effective, the audit can result in litigation for the audit firm, especially if the client becomes insolvent.

While bank regulators have mandated that an adequate ALL be established, no definite method has been identified as a preferred procedure. In contrast, the AICPA Banking Committee (1986, 13-14) has suggested that certain factors should be examined when auditing the ALL. To date, no research has been found that tested these factors in a composite model to determine their reliability in explaining loan losses.

Other factors suggested by the AICPA Audit Committee (1989, 260) as prerequisites in studying internal control environments were regulation and size. These factors were not included in the normative model for ALL determination by the AICPA Banking Committee.

In conjunction with the internal control environment, size has also been featured in numerous studies in attempts to determine the existence of an economy of scale in the banking environment. No previous research has been found that attempted to determine an economy of scale by contrasting asset size with loan losses.

The primary purpose of this study was to determine whether size and regulation help explain loan losses in addition to the factors suggested by the AICPA Banking Committee. A second purpose was to determine if loan losses could be used to determine if an economy of scale is present in banking. Finally, the factors suggested by the Banking Committee were assessed for statistical significance to determine which factors, if any, contribute to loan loss determination.

Summary of Methodology

Financial and economic data for 236 national banks for the years 1991-1993 comprised the primary data for this study. Data for 13 variables suggested by the AICPA Banking Committee were collected from Sheshunoff's Information Service: The Bank Quarterly: Ratings and Analysis and from the U.S. Bureau of Labor Statistics database: LABSTAT, as well as two variables suggested by the AICPA Professional Standards and one statistical variable.

Tests for normality of distribution were performed to determine the most appropriate statistical procedure to utilize in analyzing the data. After discovering that the data were not normally distributed, rank transformation of the data was performed as suggested by Conover (1980, 337). The transformed data was then examined for heterogeneity of slopes to determine whether analysis of covariance (ANCOVA) could be used to examine statistically the data. Only four of the variables were found to have non-parallel slopes. The small number of heterogeneous slopes and the large data set (2832 observations) were influential factors, along with the robustness of the ANCOVA model as reported by Shields (1973, 28), in determining the appropriateness of ANCOVA for statistical analysis of the data.

ANCOVA was utilized to test for statistical relationships between size, regulation, AICPA variables, and loan losses. Four subsamples of national banks were examined. One group was composed of banks that were affiliated with large holding companies. The second group of banks were affiliated with small holding companies. Each of these two

groups was subdivided into equal numbers of medium and small banks. Results of these comparisons are summarized in the following section.

Summary of Findings

A summation of the findings of this study on loan losses in national banks is discussed in the order of presentation utilized in Chapter IV. First, findings regarding possible interaction between regulation requiring annual audits and banks size are discussed as to the effect on loan losses. Second, the results of an examination into whether regulation requiring an independent audit affects loan losses follows. This examination is succeeded by a discussion of whether bank size determines loan losses. Next, an examination into whether loan losses can determine the existence of an economy of scale in banking. The summary concludes with an inspection of the possible association of loan losses and the covariates suggested by the AICPA is inspected.

The findings of this study indicate that the interaction of regulation and size does not statistically affect loan losses in national banks. The lack of an interaction allows the further study of whether the main effects of size and regulation are statistically significant. Had the interaction been significant, only simple effects could have been explored.

Findings are that regulation of national banks requiring an annual audit by a CPA is not statistically significant. The association of regulation and loan losses exhibits a low level of correlation at the .05 level of significance.

This study found that bank size as measured by total assets is a significant determinant of loan losses in national banks. Size added 10 percent more to the explained variability when added to the AICPA model.

Previous studies had disagreed about the existence of an economy of scale in banking. This finding appears to support those who argue against an economy of scale.

In a comparison of small to medium LHC member banks, medium banks were found to have significantly larger loan losses. Larger loan losses in medium banks were also found when contrasting small to medium SHC member banks.

Findings are that eight out of 14 covariate variables exhibited statistical significance at a .05 alpha level. Variables exhibiting statistical significance in determining bank loan losses are (1) the trend variable, (2) management quality, (3) problem loans, (4) changes in delinquent loans, (5) changes in consumer loans, (6) changes in construction loans, (7) previous loss experience, and (8) consumer loans.

In addition, Beta Weights were calculated for the eight predictor variables and the trend variable. Hatcher and Stepanski (1994, 431) stated "Beta Weights are the regression coefficient that would be obtained if all the variables were standardized, so that they had the same standard deviations." As illustrated in Table XIII, the trend variable has the largest Beta Weight coefficient, followed closely by management quality and problem loans. Bank size and changes in delinquent loans also contribute significant amounts to the model. Changes in consumer loans and construction loans, previous loss experience and consumer loans make equal marginal contributions to the explanation of loan losses.

TABLE XIII
COMPOSITE MODEL

Parameter	F Value	PR > F	Beta Weights*
1. Trend Variable	261.36	0.0001	.287
2. Management Quality	75.94	0.0001	-.188
3. Problem Loans	41.46	0.0001	.145
4. Size	43.91	0.0001	.119
Changes in:			
5. Delinquent Loans	24.09	0.0001	-.085
6. Consumer Loans	7.65	0.0057	.047
7. Construction Loans	6.92	0.0086	-.044
8. Previous Loss Experience	5.74	0.0166	.043
9. Consumer Loans	5.54	0.0187	.041

*Beta Weights are standardized multiple regression coefficients obtained when loan losses were regressed on the eight predictor variables and the trend variable.

The findings further indicated that construction loans, real estate loans, agricultural loans, economic conditions, and changes in real estate loans and agricultural loans were not statistically significant in explaining bank loans.

Conclusions

The research questions formulated at the inception of the study serve as the basis for the derivation of the conclusions. The five questions that follow will be examined in separate paragraphs.

1. Does regulation affect loan loss recognition in national banks?

This question was addressed by determining if a difference existed in loan losses between small SHC member banks and small LHC banks. Also addressed was the

determination of a difference between medium SHC member banks and medium LHC member banks. ANCOVA indicated no difference between either set of banks. Thus, it was concluded that regulation which required an annual audit does not result in a difference in loan losses between either sets of banks.

A possible explanation of this result is that banks may have begun to substitute audit fees for examiner fees. This area invites further investigation into this phenomena.

2. Is there a difference in loan loss recognition by national banks within LHC's due to bank size?

This question was addressed by determining whether a difference existed between small and medium LHC member banks. ANCOVA illustrated a large statistical difference between the means of the two different size LHC member banks. Thus, the conclusion is that asset size does serve to explain loan losses in LHC member banks.

Demsetz and Strahan (1995, 15-18) suggested that large companies have greater leverage and are engaging in riskier activities. This explanation might explain the greater losses incurred by medium banks as compared to small banks. As the medium banks seek riskier returns, they incur increased loan losses as well.

3. Is there a difference in loan loss recognition by national banks within SHCs due to bank size?

This question was addressed by an examination to determine if a difference exists in loan loss recognition between small and medium SHC member banks. The results from the use of ANCOVA illustrate that a statistical difference was discovered between small and medium SHC banks. A conclusion was determined from this finding that size does serve to explain loan losses in SHC member banks.

From these conclusions, size appears to be a variable that an auditor would use if he was constructing a predictive model for loan loss determination. A definite appearance of necessity is indicated for an aggregate model variable.

4. Do size and regulation interact in the determination of loan losses in national banks?

This question was addressed by an investigation to determine if a difference in loan loss recognition exists between small LHC member banks and medium SHC member banks, as well as between small SHC member banks and medium LHC member banks. Interactions are dependent upon the statistical significance of main effects. The results from ANCOVA illustrated the lack of significance of both regulation and the size/regulation interaction. Therefore, the conclusion is that asset size and audit regulation do not interact to affect loan losses in national banks.

5. Do the variables suggested by the AICPA Banking Committee explain loan losses in national banks?

To address this question, ANCOVA was used to determine which of the variables exhibited statistical significance. The findings indicated that seven of the thirteen variables suggested by the AICPA Banking Committee were statistically significant in the determination of loan losses. The conclusion was that consumer loans, previous loss experience, problem loans, management quality, and changes in construction loans, consumer loans and delinquent loans were useful in explaining loan losses in national banks.

Also, the significance of the trend variable indicated that unknown relevant variables were omitted from the study. Determination of these variables was not feasible from this research.

It was not possible to determine any positive conclusions from the selected sample concerning the relationships, if any, between loan losses and construction loans, real estate loans, agricultural loans, economic conditions, or changes in real estate loans and agricultural loans.

Implications for Further Research

Hendriksen (1982, 10-14) states that "normative theories attempt to prescribe what data ought to be communicated and how they ought to be presented; that is they attempt to explain what *should* be rather than what *is*" (Hendriksen's emphasis). He furthers this argument by stating that they "are always difficult to evaluate and must always be subject to change as new information is obtained." In the audit guide for determining the allowance for loan losses, the AICPA described a normative model to be followed by bank auditors. This study was an attempt to test and possibly explain this model.

Both audit practitioners and academics may benefit from the findings of this study. The efficiency and effectiveness of audits can be improved by auditors who utilize the results. In addition, theorists could advance accounting theory by adjusting earlier normative theory.

Because of the exploratory nature of this research, several areas were examined. Each area could have expanded investigations conducted upon it. One example is that of

asset size effect on loan losses. Many questions concerning size remain unresolved by this study, such as the following:

1. Are large banks more efficient at making and collecting loans than small and medium banks?
2. Do large banks employ better management than do medium or small banks?
3. Does the asset size of a bank influence the portfolio selection?

Answers to these questions will come from future research conducted by those directly affected. Certainly, the Banking Committee of the AICPA, as well as the Office of the Comptroller of the Currency, should have an interest in these areas.

Another area worthy of future research involves the methodology used in this study. Analysis of covariance has seen little use by either academics or practitioners. The additional precision gained by using ANCOVA could give added benefits to studies conducted using simple analysis of variance.

A final suggestion for future research is the consideration of size and efficiency on acquired banks. With the explosion of bank acquisitions and mergers that have occurred recently, a relevant research area to be explored would be the effect on efficiency of acquired banks as compared to pre-acquisition banks.

APPENDICES

APPENDIX I

STANDARD MEASURES OF CENTRAL TENDENCY

AND DISPERSION

Small SHC Member Banks

VARIABLE	MEAN	STD DEV	MINIMUM	MAXIMUM
Loan Losses[1]	0.24	0.44	-0.39	3.65
Composition of Loan Portfolio[2]				
Construction Loans	4.12	6.30	0.00	51.00
Real Estate Loans	11.30	7.36	0.00	43.00
Consumer Loans	26.34	12.55	1.00	65.00
Agriculture Loans	2.35	5.43	0.00	43.00
Trends in Loan Volume & Delinquencies[3]				
Construction Loans	1.40	35.20	-100.00	100.00
Real Estate Loans	2.26	19.64	-86.70	100.00
Consumer Loans	0.11	11.69	-75.00	71.40
Agriculture Loans	0.59	22.32	-100.00	100.00
Delinquent Loans[4]	0.51	49.54	-100.00	100.00
Other Factors				
Problem Loans[5]	1.29	1.66	0.00	11.97
Econ. Conditions[6]	7.23	2.72	2.60	22.20
Mgt. Quality[7]	36.46	25.76	0.00	98.00
Previous Loss & Recovery[8]	0.25	0.44	-0.39	3.65
Trend Variable	342.00	111.89	191.00	493.00

[1]measured as a percentage of average loans
[2]measured as a percentage of total assets
[3]measured as the change in percentage of total assets
[4]measured as the change in percentage of nonaccrual loans vs gross loans
[5]measured as the nonaccrual loans as a percentage of gross loans
[6]measured as the change in county/parish unemployment rates
[7]measured by President's weighting: a Sheshunoff statistic
[8]measured by quarterly loan losses as a percentage of average assets lagged one quarter

Medium SHC Member Banks

VARIABLE	MEAN	STD DEV	MINIMUM	MAXIMUM
Loan Losses[1]	**0.31**	**0.50**	**-0.58**	**3.92**
Composition of Loan Portfolio[2]				
Construction Loans	2.70	4.13	0.00	27.00
Real Estate Loans	12.94	6.51	1.00	38.00
Consumer Loans	31.05	12.57	3.00	62.00
Agriculture	1.40	2.87	0.00	20.00
Trends in Loan Volume & Delinquencies[3]				
Construction Loans	-1.90	33.02	-100.00	100.00
Real Estate Loans	1.88	15.32	-83.30	88.90
Consumer Loans	-0.29	10.87	-91.20	90.90
Agriculture Loans	-0.12	20.55	-100.00	100.00
Delinquent Loans[4]	0.99	39.46	-100.00	100.00
Other Factors				
Problem Loans[5]	1.43	1.86	0.00	14.86
Econ. Conditions[6]	7.37	2.83	2.20	27.80
Mgt. Quality[7]	45.54	32.29	0.00	98.00
Previous Loss & Recovery[8]	0.31	0.50	-0.58	3.92
Trend	342.00	111.89	191.00	493.00

[1]measured as a percentage of average loans
[2]measured as a percentage of total assets
[3]measured as the change in percentage of total assets
[4]measured as the change in percentage of nonaccrual loans vs gross loans
[5]measured as the nonaccrual loans as a percentage of gross loans
[6]measured as the change in county/parish unemployment rates
[7]measured by President's weighting: a Sheshunoff statistic
[8]measured by quarterly loan losses as a percentage of average assets lagged one quarter

Small LHC Member Banks

VARIABLE	MEAN	STD DEV	MINIMUM	MAXIMUM
Loan Losses[1]	0.22	0.56	-1.14	5.09
Composition of Loan Portfolio[2]:				
Construction Loans	1.42	2.03	0.00	12.00
Real Estate Loans	8.03	6.02	0.00	41.00
Consumer Loans	28.38	14.41	5.00	65.00
Agriculture Loans	5.38	7.07	0.00	29.00
Trends in Loan Volume & Delinquencies[3]				
Construction Loans	-0.33	35.90	-100.00	100.00
Real Estate Loans	0.88	17.99	-64.70	100.00
Consumer Loans	0.11	9.70	-50.00	59.30
Agriculture Loans	1.20	20.29	-100.00	100.00
Delinquent Loans[4]	-2.33	7.20	-100.00	100.00
Other Factors				
Problem Loans[5]	0.94	1.85	0.00	20.68
Econ. Conditions	6.92	2.92	1.60	19.20
Mgt. Quality	54.48	23.81	2.00	98.00
Previous Loss & Recovery8	0.22	0.56	-1.14	5.09
Trend	342.00	111.89	191.00	493.00

[1]measured as a percentage of average loans
[2]measured as a percentage of total assets
[3]measured as the change in percentage of total assets
[4]measured as the change in percentage of nonaccrual loans vs gross loans
[5]measured as the nonaccrual loans as a percentage of gross loans
[6]measured as the change in county/parish unemployment rates
[7]measured by President's weighting: a Sheshunoff statistic
[8]measured by quarterly loan losses as a percentage of average assets lagged one quarter

Medium LHC Member Banks

VARIABLE	MEAN	STD DEV	MINIMUM	MAXIMUM
Loan Losses[1]	0.30	0.46	-0.63	3.81
Composition of Loan Portfolio[2]				
Construction Loans	1.67	1.93	0.00	13.00
Real Estate Loans	9.71	5.36	1.00	40.00
Consumer Loans	34.12	13.57	7.00	68.00
Agriculture Loans	2.04	3.87	0.00	22.00
Trends in Loan Volume & Delinquencies[3]				
Construction Loans	0.12	34.64	-100.00	100.00
Real Estate Loans	0.97	16.79	-91.20	100.00
Consumer Loans	0.58	8.01	-72.20	40.00
Agriculture Loans	-0.22	15.78	-100.00	100.00
Delinquent Loans[4]	-2.00	39.30	-100.00	100.00
Other Factors				
Problem Loans[5]	1.07	1.05	0.00	6.64
Econ. Conditions	6.99	2.29	1.90	17.30
Mgt. Quality	52.53	25.71	2.00	98.00
Previous Loss & Recovery8	0.30	0.46	-0.63	3.81
Trend	342.00	111.89	191.00	493.00

[1]measured as a percentage of average assets
[2]measured as a percentage of total assets
[3]measured as the change in percentage of total assets
[4]measured as the change in percentage of nonaccrual loans vs gross loans
[5]measured as the nonaccrual loans as a percentage of gross loans
[6]measured as the change in county/parish unemployment rates
[7]measured by President's weighting: a Sheshunoff statistic
[8]measured by quarterly loan losses as a percentage of average assets lagged one quarter

APPENDIX II

RANKED ANALYSIS OF COVARIANCE

Ranked Analysis of Covariance

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F
MODEL	16	410158918.2	25634932.4	48.73	0.0001
ERROR	2814	480248023.7	526029.9		
CORRECTED TOTAL	2830	1890406941.9			

R-SQUARE	C.V.	ROOT MSE	LOAN LOSS MEAN
0.216969	51.18824	725.2792	1416.886

SOURCE	DF	TYPE III SS	MEAN SQUARE	F VALUE	PR > F
REGULATION & SIZE EFFECTS:					
Regulation	1	305869.7	305869.7	0.58	0.4458
Size	**1**	**19525783.1**	**19525783.1**	**37.12**	**0.0001**
COMPOSITION OF LOAN PORTFOLIO:					
Construction	1	532968.5	532968.5	1.01	0.3142
Real Estate	1	253.7	253.7	0.00	0.9825
Consumer	**1**	**2830072.3**	**2830072.3**	**5.38**	**0.0204**
Agriculture	1	1562857.9	1562857.9	2.97	0.0849
TRENDS (CHANGES) IN LOAN VOLUME AND DELINQUENCIES:					
Construction	**1**	**3887077.1**	**3887077.1**	**7.39**	**0.0066**
Real Estate	1	431372.8	431372.8	0.82	0.3652
Consumer	**1**	**3837116.2**	**3837116.2**	**7.29**	**0.0070**
Agriculture	1	151830.2	151830.2	0.29	0.5911
Delinquent	**1**	**12638677.0**	**12638677.0**	**24.03**	**0.0001**
POTENTIAL PROBLEM LOANS AND RESULTS OF REGULATORY EXAMS:					
Prob. Loans	**1**	**22524527.0**	**22524527.0**	**42.82**	**0.0001**
ECONOMIC CONDITIONS:					
Local Unemployment	1	797248.2	797248.2	1.52	0.2184
EXPERIENCE, COMPETENCE & DEPTH OF MANAGEMENT:					
Management	**1**	**28697204.0**	**28697204.0**	**54.55**	**0.0001**
PREVIOUS LOSS & RECOVERY EXPERIENCE:					
Previous Loss Experience	**1**	**3144411.7**	**3144411.7**	**5.98**	**0.0145**
TREND:	**1**	**133459888.0**	**133459888.0**	**253.71**	**0.0001**

APPENDIX III

UNRANKED ANALYSIS OF COVARIANCE

Unranked Analysis of Covariance

DEPENDENT VARIABLE: Loan Losses

SOURCE	DF	SUM OF SQUARES	MEAN SQUARE	F VALUE	PR > F
MODEL	16	162.9462469	10.1841404	54.49	0.0001
ERROR	2814	525.9443600	0.1869028		
CORRECTED TOTAL	2830	688.8906070			

R-SQUARE	C.V.	ROOT MSE	LOAN LOSS MEAN
0.236534	159.7871	0.432323	0.270562

SOURCE	DF	TYPE III SS	MEAN SQUARE	F VALUE	PR > F
REGULATION & SIZE EFFECTS:					
Regulation	**1**	**1.51066643**	**1.51066643**	**8.08**	**0.0045**
Size	**1**	**2.71430099**	**2.71430099**	**14.52**	**0.0001**
COMPOSITION OF LOAN PORTFOLIO:					
Construction	1	0.30239822	0.30239822	1.62	0.2035
Real Estate	1	0.00141704	0.00141704	0.01	0.9306
Consumer	1	0.01440005	0.01440005	0.08	0.7814
Agriculture	1	0.04753940	0.04753940	0.25	0.6141
TRENDS (CHANGES) IN LOAN VOLUME AND DELINQUENCIES:					
Construction	1	0.22375897	0.22375897	1.20	0.2740
Real Estate	1	0.05428249	0.05428249	0.29	0.5900
Consumer	1	0.09541453	0.09541453	0.51	0.4750
Agriculture	1	0.10964568	0.10964568	0.59	0.4438
Delinquent	**1**	**3.09312076**	**3.09312076**	**16.55**	**0.0001**
POTENTIAL PROBLEM LOANS AND RESULTS OF REGULATORY EXAMS:					
Problem	**1**	**28.98496170**	**28.98496170**	**155.08**	**0.0001**
ECONOMIC CONDITIONS:					
Local Unemployment	1	0.00445835	0.00445835	0.02	0.8773
EXPERIENCE, COMPETENCE & DEPTH OF MANAGEMENT:					
Management	**1**	**16.46383297**	**16.46383297**	**88.09**	**0.0001**
PREVIOUS LOSS & RECOVERY EXPERIENCE:					
Previous Loss Experience	**1**	**6.50163240**	**6.50163240**	**34.79**	**0.0001**
Trend	**1**	**37.07139524**	**37.07139524**	**198.35**	**0.0001**

APPENDIX IV

LIST OF BANKS

(Listed Alphabetically by State & County/Parish)

Medium Size LHC Member Banks

(Page 1 of 2)

CITY	COUNTY/PARISH	STATE	BANK NAME
CULLMAN	Cullman	AL	SouthTrust Bank of Cullman, NA
FLORENCE	Lauderdale	AL	FNB of Florence
OPP	Covington	AL	SouthTrustBank of Covington County, NA
EL DORADO	Union	AR	The First National Bank of El Dorado
PHOENIX	Maricopa	AZ	Northern Trust Bank of Arizona, NA
ALAMEDA	Alameda	CA	Alameda FNB
PLEASANTON	Alameda	CA	Community FNB
DENVER	Denver	CO	FNB Southeast Denver
FORT COLLINS	Larimer	CO	1st Interstate Bank of Fort Collins, NA
WASHINGTON	DC	DC	Citizens Bank of Washington, NA
HOBE SOUND	Martin	FL	Barnett Bank of Martin County, NA
NAPLES	Collier	FL	Sun Bank/Naples, NA
TALLAHASSEE	Leon	FL	Sun Bank/Tallahassee
AUGUSTA	Richmond	GA	Trust Co. Bank of Augusta, NA
BRUNSWICK	Glenn	GA	Barnett Bank of Southeast Georgia, NA
CORNELIA	Habersham	GA	FNB of Habersham
SAVANNAH	Chatham	GA	Trust Co. of Ga. Bank of Savannah, NA
BELLEVILLE	St. Clair	IL	Boatmen's National Bank of Belleville
CHARLESTON	Coles	IL	Boatmen's National Bank of Charleston
DOWNERS GROVE	Du Page	IL	Citizens National Bank of Downers Grove
MOLINE	Rock Island	IL	First Midwest Bank/Western Illinois, NA
ROCK ISLAND	Rock Island	IL	FIRST OF AMERICA Bank-Quad Cities, NA
EVANSVILLE	Vanderburgh	IN	The National City Bank of Evansville
MARION	Grant	IN	Bank One, Marion, IN, NA
WARSAW	Kosciusko	IN	FNB of Warsaw
LAFAYETTE	Lafayette	LA	The FNB of Lafayette
LAKE CHARLES	Calcasieu	LA	The FNB of Lake Charles
LEONARDTOWN	St. Mary's	MD	The FNB of St. Mary's at Leonardtown
FENTON	Genesee	MI	Bank One, Fenton, NA
MARQUETTE	Marquette	MI	1st of America Bank-Upp. Peninsula, NA
ST. CLOUD	Stearns	MN	The First American N. B. of St. Cloud
CAPE GIRARDEAU	Cape Girardeau	MO	Boatmen's N.B. of Cape Girardeau
JOPLIN	Jasper	MO	Mercantile Bank of Joplin, NA
JOPLIN	Jasper	MO	Commerce Bank of Joplin, NA

Medium Size LHC Member Banks

(Page 2 of 2)

CITY	COUNTY/PARISH	STATE	BANK NAME
BILLINGS	Yellowstone	MT	Norwest Bank Billings, NA
GREAT FALLS	Cascade	MT	Norwest Bank Great Falls, NA
HELENA	Lewis & Clark	MT	Norwest Bank Helena, NA
COLUMBUS	Platte	NE	FNB & TC of Columbus
CLOVIS	Curry	NM	Sunwest Bank of Clovis, NA
SANTA FE	Sante Fe	M	First Interstate Bank of New Mexico, NA
GLENS FALLS	Warren	NY	Glens Falls National Bank & Trust Co.
CAMBRIDGE	Guernsey	OH	Bank One, Cambridge, NA
FREMONT	Sandusky	OH	Bank One, Fremont, NA
PORTSMOUTH	Scioto	OH	Bank One, Portsmouth, NA
STEUBENVILLE	Jefferson	OH	Bank One, Steubenville, NA
DANVILLE	Montour	PA	The FNB OF Danville
GREENCASTLE	Franklin	PA	Citizens N.B. of Southern Penn.
STATE COLLEGE	Centre	PA	The People's N.B. of Central Penn.
CROSSVILLE	Cumberland	TN	The FNB of Crossville
KNOXVILLE	Knox	TN	National Bank of Commerce (NBC)
SHELBYVILLE	Bedford	TN	FNB of Shelbyville
GALVESTON	Galveston	TX	The U. S. National Bank of Galveston
HOUSTON	Harris	TX	Charter National Bank - Colonial
HOUSTON	Harris	TX	Charter National Bank - Houston
NACOGDOCHES	Nacogdoches	TX	Stone Fort National Bank
SHAWANO	Shawano	WI	Valley Bank of Shawano, NA
BLUEFIELD	Mercer	WV	The Flat Top National Bank of Bluefield
FAIRMONT	Marion	WV	City National Bank of Fairmont
CLARKSBURG	Harrison	WV	The Empire National Bank of Clarksburg

Medium Size SHC Member Banks

(Page 1 of 2)

CITY	COUNTY/PARISH	STATE	BANK NAME
HUNTINGTON BEACH	Orange	CA	Huntington National Bank
LOS ANGELES	Los Angeles	CA	Marathon National Bank
NEWPORT BEACH	Orange	CA	Pacific National Bank
ORANGE	Orange	CA	Orange National Bank
RANCHO CUCAMONGA	San Bernardino	CA	Vineyard National Bank
SACRAMENTO	Sacramento	CA	Sacramento FNB
SAN DIEGO	San Diego	CA	San Diego National Bank
SANTA MONICA	Los Angeles	CA	First Professional Bank NA
VISALIA	Tulare	CA	Mineral King National Bank
NAPLES	Collier	FL	Citizens National Bank of Naples
DECATUR	De Kalb	GA	Fidelity National Bank
GRIFFIN	Spalding	GA	FNB of Griffin
MOULTRIE	Colquitt	GA	Moultrie National Bank
HONOLULU	Honolulu	HI	Hawaii National Bank
IOWA CITY	Johnson	IA	FNB, Iowa City, Iowa
CHAMPAIGN	Champaign	IL	The Champaign National Bank
GENESEO	Henry	IL	The Farmers National Bank of Geneseo
MOLINE	Rock Island	IL	FNB of Moline
TELL CITY	Perry	IN	The Citizens National Bank of Tell City
VINCENNES	Knox	IN	The American National Bank of Vincennes
GRETNA	Jefferson	LA	FNB of Jefferson Parish
HOUMA	Terrebonne	LA	FNB of Houma
OAKLAND	Garrett	MD	First United NB & TC
DAMARISCOTTA	Lincoln	ME	The FNB of DAMAISCOTTA
STARKVILLE	Oktibbeha	MS	National Bank of Commerce of Miss
ASHEBORO	Randolph	NC	First National Bank & Trust Co.
BRANCHVILLE	Sussex	NJ	The National Bank of Sussex County
UNION	Union	NJ	The Union Center National Bank
BATH	Steuben	NY	The Bath National Bank
BRIDGEHAMPTON	Suffolk	NY	The Bridgehampton National Bank
CANANDAIGUA	Ontario	NY	The Canadaigua National Bank & Tr. Co.
CORTLAND	Cortland	NY	FNB OF Cortland
EAST HAMPTON	Suffolk	NY	The Bank of the Hamptons NA
GLOVERSVILLE	Fulton	NY	City National Bank & Tr. Co.

Medium Size SHC Member Banks

(Page 2 of 2)

CITY	COUNTY/PARISH	STATE	BANK NAME
RHINEBECK	Dutchess	NY	The FNB OF Rhinebeck
ST. CLAIRSVILLE	Belmont	OH	Belmont National Bank
WILMINGTON	Clinton	OH	The National Bank & Tr. Co.
ZANESVILLE	Muskigum	OH	The FNB OF Zanesville
BERWICK	Columbia	PA	The FNB of Berwick
BLOOMSBURG	Columbia	PA	Columbia County Farmers National Bank
CUMBERLAND TWP	Adams	PA	Adams County National Bank
JERMYN	Lackawanna	PA	The FNB of Jermyn
JOHNSTOWN	Cambria	PA	The Moxham National Bank of Johnstown
LATROBE	Westmoreland	PA	Commercial N. B. of Westmoreland County
LEESPORT	Burks	PA	The FNB of Leesport
MOUNT JOY	Lancaster	PA	The Union National Mt. Joy Bank
NAZARETH	Northampton	PA	Nazareth National Bank & Tr. Co.
PHILADELPHIA	Philadelphia	PA	Regent National Bank
POTTSVILLE	Scuylkill	PA	The Miners National Bank
WEST CHESTER	Chester	PA	The FNB of West Chester
ROCK HILL	York	SC	Rock Hill National Bank
COLUMBIA	Maury	TN	First F. & M. National Bank of Columbia
MCMINNVILLE	Warren	TN	The FNB of McMinnville
FORT WORTH	Tarrant	TX	Summit National Bank
MARSHALL	Harrison	TX	First National Bank
FREDERICKSBURG	Spotsylvania	VA	The National Bank of Fredericksburg
KILMARNOCK	Lancaster	VA	Chesapeake National Bank
DERBY	Orleans	VT	Community National Bank
ELKINS	Randolph	WV	Citizens National Bank of Elkins

Small Size LHC Member Banks

(Page 1 of 2)

CITY	COUNTY/PARISH	STATE	BANK NAME
ANCHORAGE	Southcent. Dist.	AK	First Interstate Bank of Alaska, NA
FORT RUCKER	Dale	AL	Fort Rucker National Bank
ASHDOWN	Little River	AR	The FNB in Ashdown
CAMDEN	Ouachita	AR	Merchants & Planters Bank, NA
CHANDLER	Maricopa	AZ	First American National Bank
MILPITAS	Santa Clara	CA	The Bank of Milpitas, NA
AURORA	Arapahoe	CO	FNB of Arapahoe
IGNACIO	La Plata	CO	United Bank of Ignacio, NA
WASHINGTON	DC	DC	Security Trust Co., NA
MONTICELLO	Jefferson	FL	FNB of Jefferson County
PALM BEACH	Palm Beach	FL	Morgan Trust Co. of FL, NA
QUINCY	Gadsden	FL	Gadsden National Bank
TALLAHASSEE	Leon	FL	City National Bank
TARPON SPRINGS	Pinellas	FL	First National Bank
COLUMBUS	Muscogee	GA	SouthTrust Bank of Columbus, NA
JEFFERSON	Jackson	GA	The FNB of Jackson County
CENTERVILLE	Appanoose	IA	Hawkeye Bank of Centerville, NA
BATAVIA	Kane	IL	Harris Bank Batavia, NA
ELK GROVE VILLAGE	Cook	IL	Suburban N.B. of Elk Grove Village
GRAYVILLE	White	IL	The Peoples National Bank of Grayville
WILMETTE	Cook	IL	Harris Bank Wilmette, NA
LAWRENCEBURG	Anderson	KY	The Lawrenceburg National Bank
SCOTTSVILLE	Allen	KY	The Farmers N. B. of Scottsville
SHELBYVILLE	Shelby	KY	Liberty N. Bank of Shelbyville
OCEAN CITY	Worchester	MD	Atlantic National Bank
EAST GRAND FORKS	Polk	MN	FNB of E. Grand Forks
MARSHALL	Lyon	MN	Community FNB
WHEATON	Traverse	MN	Community FNB of Wheaton
HANNIBAL	Marion	MO	Commerce Bank of Hannibal, NA

Small Size LHC Member Banks

(Page 2 of 2)

CITY	COUNTY/PARISH	STATE	BANK NAME
LEBANON	Laclede	MO	Boatmen's National Bank of Lebanon
MONTGOMERY CITY	Montgomery	MO	Merc. Bk. of Montgomery City, NA
LEWISTOWN	Fergus	MT	Norwest Bank Lewistown, NA
LIDERWOOD	Richland	ND	Community FNB of Liderwood
WAHPETON	Richland	ND	Community FNB of Wahpeton
MCCOOK	Red Willow	NE	The FNB OF McCook
NORTH PLATTE	Lincoln	NE	North Platt National Bank
WEST POINT	Cuming	NE	The FNB of West Point
LAS CRUCES	Dona Ana	NM	Sunwest Bank of Las Cruces, NA
PORTALES	Roosevelt	NM	United New Mexico Bk at Portales,
RIO RANCHO	Sandoval	NM	Sunwest Bk of Sandoval County, NA
SOCORRO	Socorro	NM	United New Mexico Bank at Socorro,
SARATOGA SPRINGS	Saratoga	NY	Saratoga NB & TC
LANSFORD	Carbon	PA	The Citizens N. B. of Lansford
SPRING GROVE	York	PA	The Spring Grove National Bank
NASHVILLE	Davidson	TN	First American Tr. Co., NA
ATLANTA	Cass	TX	The Atlanta National Bank
BORGER	Hutchinson	TX	First National Bank of Borger
CANYON	Randall	TX	The FNB in Canyon
EASTLAND	Eastland	TX	Eastland National Bank
POST	Garza	TX	The FNB of Post
FERRUM	Franklin	VA	The FNB of Ferrum
RICHLANDS	Tazewell	VA	The Richlands National Bank
SALTVILLE	Smyth	VA	The FNB of Saltville
GENOA CITY	Walworth	WI	American N.B. & Tr. Co. of Wisc.
HARTLAND	Waukesha	WI	M & I Lake Country National Bank
RIPON	Fond Du Lac	WI	Valley First N. Bank of Ripon
BECKLEY	Raleigh	WV	First National Bank
HUNTINGTON	Cabell	WV	The Old N. Bank of Huntington
MARLINTON	Pocahantas	WV	FNB in Marlinton
AUBURN	Placer	CA	The Bank of Commerce, NA
COMMERCE	Los Angeles	CA	Commerce National Bank
NAPA	Napa	CA	Napa National Bank

Small Size SHC Member Banks

(Page 1 of 2)

CITY	COUNTY/PARISH	STATE	BANK NAME
SARATOGA	Santa Clara	CA	Saratoga National Bank
WASHINGTON	DC	DC	Adams National Bank
GEORGETOWN	Sussex	DE	Delaware National Bank
CAPE CORAL	Lee	FL	FNB of Southwest FL.
DADE CITY	Pasco	FL	FNB of Pasco
FT. MYERS	Lee	FL	Heritage National Bank
PONTE VEDRA	St. John's	FL	Ponte Vedra National Bank
PORT ST. LUCIE	St. Lucie	FL	Port St. Lucie National Bank
STARKE	Bradford	FL	FNB of Bradford County
VENICE	Sarasota	FL	Community N. Bank of Sarasota County
WINTER PARK	Orange	FL	National Bank of Commerce
ASHBURN	Turner	GA	Community National Bank
ATLANTA	Fulton	GA	The Summit National Bank
DULUTH	Gwinnett	GA	Gwinnett National Bank
GAINESVILLE	Hall	GA	Lanier National Bank
JESUP	Wayne	GA	Wayne National Bank
PEACHTREE	Fayette	GA	Peachtree National Bank
SAVANNAH	Chatham	GA	AmeriBank NA
TUCKER	De Kalb	GA	Mountain National Bank
WOODSTOCK	Cherokee	GA	North Georgia National Bank
WOODSTOCK	Cherokee	GA	FNB of Cherokee
FAIRFIELD	Jefferson	IA	FNB in Fairfield
GALENA	Jo Daviess	IL	The FNB of Galena
GENOA	De Kalb	IL	CITIZENS FNB - GENOA
LINTON	Greene	IN	Citizens' National Bank of Linton
MAYSVILLE	Mason	KY	The State National Bank of Maysville
LAFAYETTE	Lafayette	LA	MidSouth National Bank
DETROIT	Wayne	MI	First Independence N. Bank of Detroit
LANSING	Ingham	MI	Capitol National Bank
L'ANSE	Baraga	MI	Commercial National Bank of L'Anse

Small Size SHC Member Banks

(Page 2 0f 2)

CITY	COUNTY/PARISH	STATE	BANK NAME
ROGERS CITY	Presque Isle	MI	Huron National Bank
EUREKA	Lincoln	MT	FNB of Eureka
WHITEFISH	Flathead	MT	The FNB of Whitefish
ATCO	Camden	NJ	Equity National Bank
NEWARK	Essex	NJ	City National Bank of NJ
WESTMONT	Camden	NJ	Community National Bank of NJ
ATLANTA	Steuben	NY	Atlanta National Bank
CALDWELL	Noble	OH	The FNB of Southeastern Ohio
OTTAWA	Putnam	OH	The FNB of Ottawa
ROSEBURG	Douglas	OR	Douglas National Bank
EMLENTON	Venango	PA	The Farmers National Bank of Emlenton
LACEYVILLE	Wyoming	PA	The Grange N. B. of Wy Cty at L-ville
ANDERSON	Anderson	SC	Anderson National Bank
CHARLESTON	Charleston	SC	Bank of Charleston, NA
GREENWOOD	Greenwood	SC	Greenwood National Bank
SPARTANBURG	Spartanburg	SC	Spartanburg National Bank
FRANKLIN	Williamson	TN	Franklin National Bank
KNOXVILLE	Knox	TN	FNB of Knoxville
ABILENE	Taylor	TX	First State Bank, NA
FT. WORTH	Tarrant	TX	Alta Mesa National Bank
FT. WORTH	Tarrant	TX	Camp Bowie National Bank
ODESSA	Ector	TX	First State Bank, NA
STAMFORD	Jones	TX	The FNB in Stamford
REDMOND	King	WA	Redmond National Bank
MOOREFIELD	Hardy	WV	The S. Br. Valley N. B. of Moorefield
PIEDMONT	Mineral	WV	First United Bank of West Virginia, NA

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VITA

Randy Marl Reed was born in Jacksonville, Texas, on January 26, 1949. He attended public schools in Cherokee County. After relocating to Morris County in 1963, he graduated in the top 10 members of his class from Daingerfield High School in 1967.

Mr. Reed graduated from North Texas State University in 1972 with a Bachelor of Science in Biology. Returning to college in 1987, he completed the accounting curriculum at East Texas State University-Texarkana while attaining the Dean's List every semester in attendance. In 1989, Mr. Reed earned his Master of Business Administration with an emphasis in Accounting from the same university. He received his Doctor of Business Administration in Accounting in 1998 from Louisiana Tech University.

Mr. Reed taught as an Instructor of Accounting at Louisiana Tech University from 1990 until 1991. He joined the faculty of Northeastern State University in Tahlequah, Oklahoma, as an Assistant Professor of Accounting in 1995.

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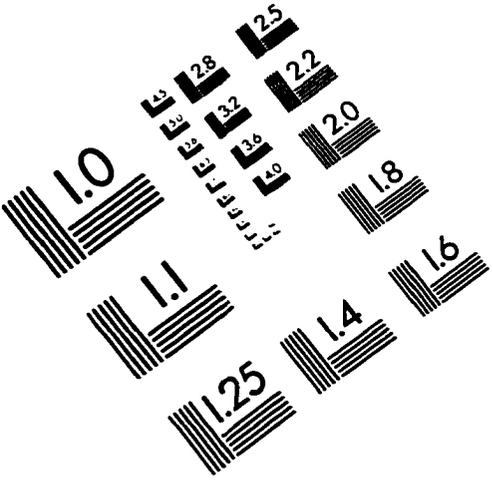

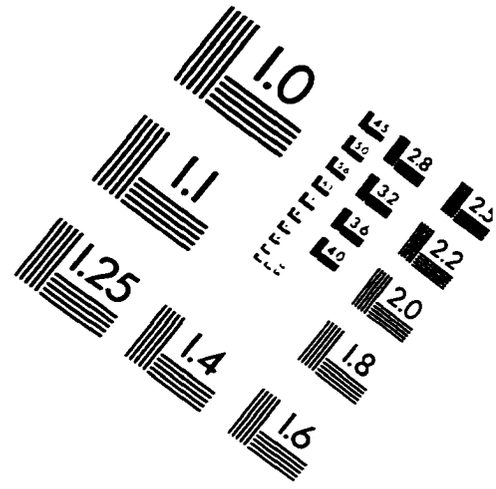

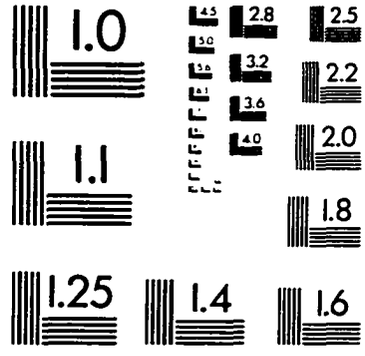

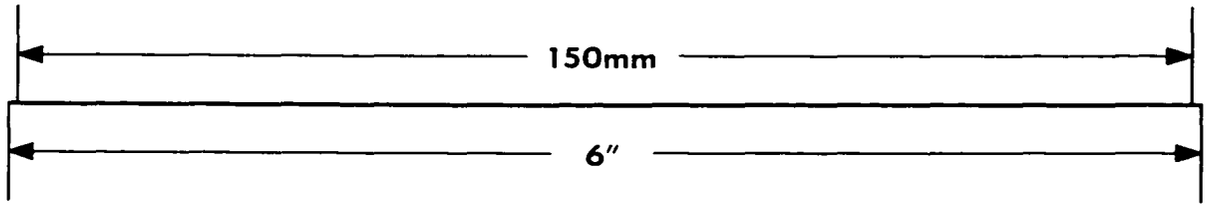

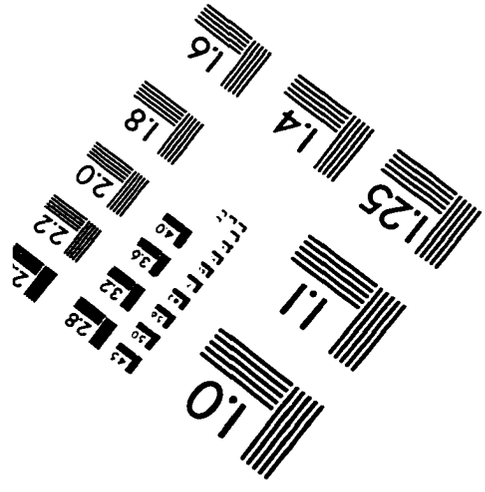

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