

THE IMPACT OF FINANCIAL DEREGULATION ON RURAL
CAPITAL MARKETS IN VIRGINIA: AN ANALYSIS OF
BANK DECISION MAKING

by

Deborah Morentz Markley

Dissertation submitted to the Faculty of the
Virginia Polytechnic Institute and State University
in partial fulfillment of the requirements for the degree of

DOCTOR OF PHILOSOPHY

in

Agricultural Economics

Approved:

B. J. Deaton, Chairman

G. W. Norton

R. A. Kramer

S. S. Batie

R. M. Simon

May, 1984

Blacksburg, Virginia

THE IMPACT OF FINANCIAL DEREGULATION ON RURAL CAPITAL
MARKETS IN VIRGINIA: AN ANALYSIS OF BANK DECISION MAKING

by

Deborah Morentz Markley

(ABSTRACT)

The primary objective of this research was to examine the potential impact of financial deregulation on capital availability in nonmetropolitan areas of Virginia by determining whether bank behavior and performance vary by the institutional structure of the bank. The research approach combines a case study analysis of bank decision making with an aggregate analysis of operating ratios that are important indicators of bank performance. The lexicographic ordering technique is used to test the behavioral hypothesis that rural banks affiliated with a multi-bank holding company have the same operating goals as rural independent unit banks. The corollary behavioral hypothesis that rural affiliate banks have the same operating flexibility as rural independent banks was tested by using the case studies to identify the administrative level at which policies are set and the influence of local conditions on the policy making process. The hypothesis that the market performance of rural affiliate banks is the same as that of independent banks was tested by using discriminant analysis to determine the statistical significance of bank operating ratios in distinguishing between rural affiliate banks from rural independent banks.

The test of the behavioral hypothesis provided limited evidence of differences in the operating goals of rural affiliate and independent banks and, therefore, the behavioral hypothesis was not rejected. The case studies identified important differences in operating flexibility, with independent bankers having greater flexibility in decision making. Therefore, the corollary behavioral hypothesis was rejected. The results of the discriminant analysis showed no striking performance differences, providing no basis for rejecting the performance hypothesis. However, two ratios were important in separating independent banks from affiliate banks. The equity capital/total assets ratio and the agricultural loans/total loans ratio were higher for independent banks. This study also identified a difference in the potential range of services offered by the banks, with affiliates able to utilize the full range of financial and human resources of the holding company to meet local capital needs.

This study identified differences between independent banks and affiliate banks that result from their differing institutional structures. These differences will most likely persist in a post-deregulation environment and suggest that financial deregulation may affect future capital availability in nonmetropolitan areas of Virginia.

Acknowledgements

The author wishes to express her deepest appreciation for the support and guidance of her chairman, Brady Deaton. His concern for the welfare of rural people and his interest in addressing the critical problems of rural areas provided the inspiration not only for this research project but for my exploration of the theory and practice of rural development. His conceptual approach to studying rural development will continue to influence my work in the future. His friendship and intellectual stimulation will always be remembered. The author also wishes to express appreciation for the guidance of her committee members, George Norton, Rick Simon, Sandra Batie, and Randy Kramer. Special thanks to Sandra for understanding the struggle of combining motherhood and academics and to Randy for his academic advice and his friendship.

The author wishes to acknowledge the financial support of the Economic Development Division of the U. S. Department of Agriculture and the advice and encouragement of

The continuing financial support of the Department of Agricultural Economics, VPI & SU, has been greatly appreciated, as well as the moral support received from many of the dedicated members of that department.

Special thanks go to the bankers who agreed to be interviewed for this project. Their contribution to this project and to my understanding of rural capital markets was great. Their comments and the pleasant interview experiences will be remembered always.

Many people in the department helped see this project through to the end and thanks go to all of them. Special thanks to for all the coffee breaks and walks we have shared over the past four years. The assistance and friendship of and have helped me to get past the many technical and administrative hurdles and they will be remembered fondly.

Finally, many thanks and much love to for the sacrifices he has made to allow me to pursue my career and for his continuing support and love throughout this process.

Table of Contents

	<u>Page</u>
Abstract	ii
Acknowledgements	iv
Table of Contents	vi
List of Tables	x
Chapter I Introduction	1
Problem Statement	2
Research Objective	9
Research Hypotheses	11
Research Approach	13
Significance of Research Approach	15
Limitations of Research Approach	16
Organization of Dissertation	16
Summary	17
Chapter II Theory and Literature Review	18
Theoretical Basis for Determining the Role of Commercial Banks in Financing Rural Economic Growth	18
Role of Capital in Regional/Nonmetropolitan Economic Growth	19
Review of Literature on Rural Fund Availability and the Role of Commercial Banks	25

Theoretical Basis for Determining the Impact of Financial Deregulation on Capital Availability	33
General Equilibrium Analysis, Regional Economics, and Market Imperfections	33
Theory of Institutional Innovation	35
Oligopoly Theory	39
Empirical Evidence from Industrial Organization Studies .	40
Review of Literature Concerning the Impacts of Financial Deregulation	44
Summary	52
Chapter III The Methods	54
The Case Study Approach	54
Procedures for Hypothesis Testing	57
Behavioral Hypothesis	57
Performance Hypothesis	64
Lending Behavior	67
Capitalization	68
Profitability	68
Behavior toward Risk	70
Economic Conditions	71
Summary and Research Applications	71
Chapter IV The Sample	75
The Banking Structure in Virginia	76
Results of Analysis of Aggregate Bank Data	82

Concentration and Bank Size	83
Bank Organizational Structure	92
Suggested Sampling Scheme	95
The Sample	97
Summary	101
 Chapter V Results	 103
Lexicographic Ordering and Constrained Maximization	103
Results indicating the Accuracy of Lexicographic Ordering Technique	109
Comparison of Independent and Affiliate Banks	118
County A	118
County B	120
County C	122
Coal Counties	123
Summary of Lexicographic Ordering Analysis	125
Discriminant Analysis of Aggregate Virginia Banking Data	129
Canonical Discriminant Analysis	130
Step-Wise Discriminant Analysis	133
Conclusions from Discriminant Analysis	135
Comparison of Aggregate Analysis and Case Study Results	137
Qualitative Results	138
Bank Support of the Local Government Sector	138
Bank Operating Flexibility	140
Views on Deregulation	143

Overview of the Impact of Deregulation on Capital Availability in Nonmetropolitan Areas	148
Chapter VI Conclusions, Policy Implications, and Research Applications	157
Conclusions	157
Implications for Capital Availability	161
Policy Implications	162
Research Applications	166
Summary	172
 <u>Appendix</u>	
A Bank Presidents' Questionnaire	173
B Elicited and Optimal Goal Orderings from Lexicographic Ordering Model for Sample Bankers	182
C Formulation of Linear Programming Models for Bankers that Resulted in Optimal Solutions	186
D Portfolio and Operating Ratio Values from Profit Maximization Model for Sample Bankers	195
References	199
Vita	205

List of Tables

<u>Table</u>	<u>Page</u>
III-1 Description of Independent Variables used in the Canonical and Step-Wise Discriminant Analyses of Federal Reserve Member Banks operating in Nonmetropolitan Virginia Counties in 1982	69
IV-1 Results of Regression Analysis of Operating Ratios for Virginia Federal Reserve Member Banks operating in Nonmetropolitan Counties in 1982 considering Concentration and Bank Size Issues	90
IV-2 Results of Regression Analysis of Operating Ratios for Virginia Federal Reserve Member Banks operating in Nonmetropolitan Counties in 1982 considering Bank Organizational Structure Issue	94
IV-3 Percentage Distribution of Virginia Federal Reserve Member Banks operating in Nonmetropolitan Counties as compared to All Banks in the Fifth Federal Reserve District	98
V-1 Bank Operating Goals and the Frequency of Ranking by Eight Sample Bankers in Selected Nonmetropolitan Counties in Virginia	105
V-2 Actual and Predicted Portfolio and Operating Ratio Values for Bankers 1 and 2 in Nonmetropolitan County A, representing Large Banks (greater than \$50 million in assets)	111
V-3 Actual and Predicted Portfolio and Operating Ratio Values for Bankers 3 and 4 in Nonmetropolitan County B, representing Small Banks (less than \$25 million in assets)	113
V-4 Actual and Predicted Portfolio and Operating Ratio Values for Bankers 5 and 6 in Nonmetropolitan County C, representing Medium Banks (between \$25 and 50 million in assets)	115
V-5 Actual and Predicted Portfolio and Operating Ratio Values for Bankers 7 and 8 in the Coal Region Counties, representing Large Banks (greater than \$50 million in assets)	117

V-6	Ranking of Standardized Coefficients for Independent Variables used in Canonical Discriminant Analysis of Bank Organizational Types: Independent and Affiliate Banks operating in Nonmetropolitan Virginia Counties and Members of the Federal Reserve, 1982	132
V-7	Results of Step-Wise Discriminant Analysis of Bank Organizational Type: Independent and Affiliate Banks operating in Nonmetropolitan Virginia Counties and Members of the Federal Reserve, 1982	134

Chapter I

Introduction

In the 1960's, an historic reversal in rural-to-urban migration resulted in population increases in rural areas of the U.S. During this same period, business and manufacturing firms moved out of metropolitan areas, particularly in the Northeast and Midwest, and into nonmetropolitan areas in the South and Southwest. While such increases hold the promise of improved economic growth for rural areas through additional employment and revenues, population increases also lead to increased demands for services financed by local governments. These services are typically limited in rural areas and increased demands for these services require large expenditures to establish new facilities or to upgrade existing ones. Such expenditures may prove burdensome for municipal governments faced with diminishing demand for small-scale municipal bonds. These areas also face declining enthusiasm for local tax increases. In addition, increased population and industry lead to increased demands for capital to meet private sector investment needs. Capital availability to meet the needs of an expanding rural population and industrial base could be a crucial limiting factor in determining the extent to which migration into rural areas will lead to improvements in the economy and the quality of life in these areas.

Problem Statement

The changes in the structure of the population and industrial bases of rural areas are occurring while major changes are overtaking the nation's financial system. Specifically, the Depository Institutions Deregulation and Monetary Control Act of 1980 legislated substantial deregulation of the industry to increase competition among commercial banks and nonbank financial intermediaries (e.g., thrift institutions, money market mutual funds.) The Act removed deposit interest rate ceilings (Regulation Q) and reduced the distinctions between bank and nonbank financial intermediaries by allowing nonbanks to offer negotiable order-of-withdrawal (NOW) accounts and to expand the scope of their lending activities. In addition to deregulation, there is support currently for repealing the McFadden Act of 1927 which prohibits interstate branch banking. Such support has already led to mergers between large banking institutions in at least one state, Virginia, as they apparently position themselves for interstate banking in the near future. In addition, discussions to consider regional interstate banking are taking place in several regions of the country. Regional interstate banking is modeled after the banking region formed by several New England states and is viewed as a preliminary step to full-scale interstate banking.

While financial deregulation was designed to increase competition between banks and nonbanks, these policy changes should also reduce

the constraints created by past regulations on the efficient functioning of financial intermediaries. In the past, regulations served to protect small banks by virtually ensuring their profitability. This was accomplished by controlling their cost of funds through deposit interest rate ceilings and limiting the geographic reach of their large bank competitors. These regulations created an environment relatively free of competition and may have led to a proliferation of banks which went beyond the numbers that would efficiently serve the public. At the same time, technically inefficient banks (those not operating at the minimum point on their long run average cost curves) were able to survive and profit from these regulations. Therefore, deregulation may create a more technically efficient financial market by allowing banking institutions to take advantage of economies of size through merger.

While technical efficiency in banking markets may be increased as a result of deregulation, some researchers predict major structural changes in the banking industry, specifically a relative decline in the number of independent unit banks and an increase in the number of large intra-state or inter-state banks (Rhoades, 1980). In Virginia, independent unit banks are those banks that operate in a single county or city and may have branches only in their own or neighboring localities. Affiliate banks are those affiliated with multi-bank holding companies that operate throughout the state as a result of branching by acquiring smaller banking institutions.

The bank merger movement appears to be strong, both nationally and in Virginia. A recent merger in Virginia was described as a "tough business decision" by the bank's chairwoman. She commented that "smallness is no longer an advantage" and small banks must compete with large banks, as well as with Sears, Merrill Lynch, and others for the same dollar (Churn). Although bank mergers may make economic sense, Virginia's Commissioner of the Bureau of Financial Institutions notes that "anytime a community-oriented bank ceases to exist as a special entity, something is lost in that community" (Churn).

Other observers take a stronger view of recent merger trends and predict that the outcome of such activity will be an industry dominated by only fifteen to twenty major players.

"What will happen when that happens? Most obviously, more financial resources will be concentrated in fewer hands: an old Populist nightmare come true. According to the old script, that means that the squeeze will be put on the average (particularly rural) person, and that resources will be sucked out of most of the country and deposited on Wall Street" (Lemann).

The point of view expressed above suggests an important concern about the structure of a deregulated financial services industry. While

technical efficiency may be achieved through merger and a consequent increase in average bank size, this merger activity may also have the effect of increasing economic concentration in financial markets and reducing overall market efficiency. If a few large firms were to dominate the industry, an oligopolist market structure could result. Such an oligopolistic structure represents an important departure from a perfectly competitive market and has important consequences for the price and output levels that will prevail.

Whether deregulation results in a more technically efficient industry or just a greater concentration of banking resources, it is unlikely that the historical role of banks as quasi-public institutions will change markedly. There is likely to be a continued federal role in regulating this industry. While the Reagan administration has proposed a deregulation bill which would allow banks to offer a much wider array of financial services, the Federal Reserve has proposed a moratorium on such diversification. The moratorium was proposed as a way of slowing the changes overtaking the industry to allow some adjustment time for the institutions affected by deregulation. In between these two extreme positions falls a bill introduced by Senator Jake Garn that would allow diversification by banks, but would impose constraints designed to protect against any undue concentration of financial resources. Such a compromise position is more likely to be accepted than the free market approach of the Administration or the more cautious approach taken by the Federal Reserve.

Regardless of the nature of a deregulated financial services industry, it is clear that small banks must respond creatively in order to survive in a new era of banking. In an increasingly competitive industry, small banks are forced to follow the lead of their large, particularly urban, counterparts. "The small bank's central problem, however, is the lack of management depth and expertise or the economies of scale required to successfully play follow-the-leader. Moreover, as old regulations and restrictions give way, the legislated underpinnings of their profitability could crumble quickly" (Heylar and Salamon). As a result, small banks are beginning to mimic the activities of larger banks operating in major urban financial centers. The question that arises, however, is whether new approaches to attracting customers that work in city markets (e.g., new money market deposit accounts, preferred customer services for customers with large deposit accounts) are applicable in rural banking markets. At the same time, the impact of these changes on bank customers, particularly in rural areas, is not known.

The focus of the above discussion about financial deregulation has been on its ability to enhance competition and its potential impact on both technical and market efficiency. As used here, technical efficiency relates to the cost structure of banking institutions. The most efficient banks would be operating at or near the minimum point on their long run average cost curves which would imply the least cost per unit of output. In turn, this technical efficiency may vary with the

size of a particular institution and its ability to capture economies of size which may exist in banking. Market efficiency, in turn, relates to the overall structure of the financial industry, i.e., whether or not the conditions for perfect competition are met. Specifically, the focus of concern is the concentration of financial resources in the hands of a few financial institutions, thus violating the perfect market assumption of many buyers and sellers.

While deregulation was designed to deal with the aspects of efficiency described above, the regulation of banking institutions in the post-Depression years served a different purpose. The primary concern at that time was to regulate an institution that was described as a "public utility" (Gruchy, p. 4). Gruchy goes on to note that "since 1911 the legal foundation of bank regulation has been further strengthened by a series of State and federal court decisions which have repeatedly called attention to the very close relations existing between the public welfare and the business of banking" (p. 5). After the bank failures of the 1930's, concern with the stability of our financial system led to regulation of the activities undertaken by banks and of their geographical reach. Bank liquidity was an important concern, leading to regulations on the percentage of assets that could be lent by each bank. In general, regulation forced the financial industry into a more conservative, less risky and, therefore, more stable position.

As described above, these regulations led to a banking structure dominated by many small banking institutions operating in all areas of the nation. The results of regulation may have been a less technically efficient industry due to the small size of banking institutions, but it also resulted in a wide distribution of banks throughout the country. Banks could survive profitably, even in small rural areas, as a result of the protection afforded by regulation.

Whether small banks can continue to survive in a new, deregulated environment remains an important question. The concern that arises for rural communities is that an adequate flow of capital be made available at reasonable costs to facilitate economic development and meet consumer needs. While financial deregulation may improve the technical efficiency in the national capital market, it is possible that past banking regulations served as a means of promoting greater geographical distribution of financial institutions and, as a result, of improving capital availability in rural areas. However, there has been limited study to determine the impact of financial deregulation on subregions of our national economy, particularly rural areas. This study is designed to make a contribution in understanding this issue by analyzing the impact of financial deregulation on capital availability in nonmetropolitan areas of Virginia.

Research Objective

The primary objective of this research was to examine the potential impact of financial deregulation on capital availability in nonmetropolitan areas of Virginia by determining whether bank behavior and performance vary by the institutional structure of the bank. It is suspected that deregulation will result in more mergers, leading to an increase in the number of affiliate banks and a decrease in the number of independent banks in operation. The institutional innovation theory posited by Davis and North provides support for the predicted increase in affiliates relative to independents. Their theory states that a new institutional structure will be formed when a change in an equilibrium situation creates the potential for profits that cannot be captured through existing institutions.

Deregulation leads to a new market situation characterized by greater risk associated with new financial instruments (money market accounts) and the higher cost of funds. In addition, management expertise becomes more crucial since asset-liability management assumes greater importance as interest rate ceilings are removed. These changing circumstances suggest the creation of a new (or the mutation of an old) institution that exhibits less risk averse behavior and that has greater financial and management resources. The holding company, along with its affiliate banks, appears to represent the banking system's response to the need for such an institutional structure.

While Davis and North's theory of institutional innovation would predict an increase in banks affiliated through merger as a result of deregulation, other researchers also predict such an increase (Struck and Mandell, Nyankori and Miller, Rhoades and Savage). Therefore, the impact of financial deregulation on nonmetropolitan capital markets will be determined in this research by analyzing differences in the behavior and performance of banks with different organizational structures, i.e., independent or affiliate.

As a first step in this research process, it was necessary to identify the role or function of commercial banks in relation to the nonbank sectors of the local rural economy. By doing so, the importance of commercial banks in financing economic activities and promoting local economic growth can be more clearly identified. Work by Davis and North places in historical perspective the role of commercial banks in the economic growth process. In addition, more recent empirical research substantiates the important role of commercial banks in financing local rural business and government sector economic activities (Sullivan; Hooker; Combs, Pulver, and Shaffer; Stevens, Bunch, and Soth). Once such a functional relationship between bank and nonbank sectors of a local economy is described, however, it must be analyzed in light of potential impacts of deregulation on local capital markets.

Research Hypotheses

Two sets of hypotheses were tested in order to satisfy the research objective. The arguments presented above suggest that affiliate and independent banks behave and perform differently. However, in order to test these hypotheses with statistical tools, they are stated in the null form below. The behavioral hypothesis states that:

Rural affiliate banks have the same operating goals as their independent bank counterparts.

The behavioral hypothesis was specified to determine differences in the behavioral characteristics of rural affiliate and independent bankers. Behavioral differences are defined as differences in operating goals; that is, whether the banker maximizes multiple goals, including profit maximization, or whether the banker is a strict profit maximizer. In order to test the behavioral hypothesis, operating goals were identified by completing a lexicographic ordering of operating goals for each banker. A comparison was made of the actual portfolios and the portfolios predicted from the application of a linear programming model to the lexicographic ordering.

A corollary behavioral hypothesis was tested to determine whether differences exist in the operating flexibility of the two bank types. This corollary behavioral hypothesis states that:

Rural affiliate banks have the same operating flexibility as their independent bank counterparts.

In testing the corollary behavioral hypothesis, the operating flexibility of each banker was determined through personal interviews to identify how loan and interest rate policies are set and how capital allocation decisions are made. Operating flexibility is said to be greater for those bankers who are able to set policy and make allocation decisions at the local level, in response to particular local circumstances.

Behavioral differences among types of bankers may imply not only differences in operating procedures, but also may be reflected in differences in the performance of these banks in their local markets. To determine whether behavioral differences are reflected in bank performance, analysis of specific bank performance measures was undertaken to determine whether differences exist between bank types. Such performance differences, in turn, may be consistent with any behavioral differences identified by testing the behavioral hypothesis. The performance hypothesis states that:

The performance of rural affiliate banks is the same as that of rural independent banks.

In order to test the performance hypothesis, bank performance was measured by nine specific bank operating ratios. Differences in performance were determined from the results of a discriminant analysis, using these nine ratios as independent variables.

In testing all three hypotheses, rural affiliate and independent banks were specified as those banks operating in nonmetropolitan counties in Virginia. Nonmetropolitan counties are those lying outside the Standard Metropolitan Statistical Areas of Virginia (Rural Affairs Study Commission). Banks classified as affiliates are those affiliated with multi-bank holding companies operating in Virginia. Banks classified as independents are strictly unit banks operating in a single county or city and the branches of independent banks that may operate in a city or county adjacent to the locality including the home office. In addition, the single bank holding companies operating in Virginia are classified as independent banks. These holding companies function like large independent banks, operating branches throughout the state, but retaining control at the home office.

Research Approach

The research method used in this study combines a case study analysis of a sample of Virginia bankers with an analysis of aggregate banking data for all Federal Reserve member banks operating in nonmetropolitan counties in Virginia. The case study analysis is designed to obtain information necessary to test the behavioral hypothesis and its corollary. The aggregate data is used in a discriminant analysis designed to test the performance hypothesis.

The behavioral hypothesis is tested by applying a model of decision making behavior, the lexicographic ordering technique, to the

responses obtained from a survey of a stratified sample of bank presidents in Virginia. The lexicographic ordering technique was selected based on the results of a pretest that determined bankers' preference structures by applying both the lexicographic ordering technique and the modified Von Neumann-Morgenstern technique.

The lexicographic ordering technique was applied to a stratified sample of bank presidents operating in nonmetropolitan counties in Virginia. A preliminary analysis of aggregate banking data was completed to determine which factors should be considered in the sample stratification process. The final sample used to test the behavioral and corollary behavioral hypotheses consisted of four bank pairs, including one independent bank and one affiliate bank, representing three different size classes and operating in four different areas of the state.

The personal interview used to apply the lexicographic ordering technique was also used to identify differences in the operating flexibility of the two bank types. Differences in operating flexibility were determined based on the responses given by the bankers to several questions related to lending authority, interest rate determination, and capital allocation decisions.

The performance hypothesis was tested by analyzing bank operating ratios for all nonmetropolitan banks in Virginia. Discriminant analysis was used to determine which bank operating ratios were statistically significant explanatory variables in classifying banks as to

organizational structure, i.e., independent or affiliate. Nine operating ratios and two economic variables were considered in the analysis.

Significance of Research Approach

Unlike other studies that considered only performance differences between affiliate and independent banks (Kolb, Snider, Rose and Fraser), this study analyzes differences in bank behavior that underlie bank performance. The institutional structure of the bank is recognized as potentially important in determining bank behavior and, consequently, performance in a local market. By taking such an institutional approach, it is possible to identify differences between bank types that result from their differing institutional structures. Although the full impacts of financial deregulation will be determined only in the next five to ten years, the results achieved by using this research approach should be useful in describing the potential impacts of financial deregulation on nonmetropolitan capital markets in Virginia. This approach can identify behavioral differences that are inherent in the institutional structures of the two bank types and that should continue as long as the institutional distinctions between the two bank types remain. Such institutional differences are more likely to remain in a deregulated environment than differences that are dependent on current market conditions.

Limitations of the Research Approach

A case study approach was selected for this study as the best way to get the detailed information required to test the behavioral and corollary behavioral hypotheses. Although the results of any case study are necessarily limited by the small sample used, this approach was combined with the aggregate discriminant analysis to extend the usefulness of the results. In addition, this study did not attempt to undertake a longitudinal analysis of bank behavior and represents a static comparison of bank behavior across bank types. Finally, the focus of this analysis was on bank behavior, as expressed by each bank president interviewed. This approach considers the supply side of the local capital market and does not consider the demand components of the local market. The scope of this study was necessarily restricted to enable an in-depth analysis of bank behavior across institutional types.

Organization of Dissertation

Chapter II provides the theoretical development of this research and a review of the relevant literature. The methods used in testing the hypotheses described above are detailed in Chapter III. Chapter IV describes the structure of banking in Virginia, the sampling scheme, and data resources. Chapter V presents the results of this study, while Chapter VI discusses the important conclusions and applications of this research. A summary is included at the end of each chapter.

Summary

As the population and industrial bases of nonmetropolitan areas continue to grow, capital availability to meet increased private and public sector capital requirements could be an important factor influencing nonmetropolitan growth and development. Given these economic conditions, the impact of financial deregulation on capital availability in nonmetropolitan areas is important to identify. This research addresses this issue by considering both behavioral and performance differences that characterize different types of banking institutions, i.e., independents or affiliates. If deregulation results in more banks affiliated through merger and fewer independent banks, then the differences between these bank types, particularly in relation to how they allocate capital in the local area, may provide important insight into the potential impact of financial deregulation on nonmetropolitan areas.

Chapter II

Theory and Literature Review

This chapter provides the theoretical basis for this research and a review of the relevant literature. The first section provides theoretical and empirical support for the maintained hypothesis of this research: that commercial banks play an important role in financing rural government and business sector economic activities. This hypothesis is not tested in this study, but is assumed to hold. The following section provides the theoretical basis for the primary research objective. A review of relevant literature is presented in each section.

Theoretical Basis for Determining the Role of Commercial Banks in Financing Rural Economic Growth

This research begins by assuming the importance of commercial banks in financing rural economic growth in Virginia. Underlying this assumption is the concept of the role of capital in the economic growth process. Commercial banks serve as intermediaries in capital markets and as the primary source of investment capital in local markets. To understand the role played by commercial banks in rural economic development, it is necessary to identify the role of capital in the economic growth process. The importance of capital as a resource in any economic development process is widely accepted. According to

Nobel Laureate Theodore W. Schultz, capital serves as the "mainspring of economic growth" (p. 12) and, therefore, as a crucial factor in the process of economic development.¹ There is not, however, a single coherent theory of economic growth upon which to draw. The following discussion focuses on several aspects of growth theory in an attempt to better determine the role of capital in the economic growth process.

Role of Capital in Regional/Nonmetropolitan Economic Growth

This research focuses on a subregion of a larger economy, namely, nonmetropolitan counties in Virginia. Therefore, the theory used to describe the role of commercial banks in rural economic growth must be pertinent to the analysis of regions in an economy. According to Vinod Dubey, regional economics is "the study, from the viewpoint of economics, of the differentiation and interrelationships of areas in a universe of unevenly distributed and imperfectly mobile resources" (p. 7). Such a definition raises the issue of whether a theory relying on the assumptions of perfect markets, e.g., the neoclassical theory of economic growth, is appropriate for this study. Given the potential for less than perfect factor mobility in rural areas, a regional economics approach is assumed to be most appropriate for this research. Several authors have addressed the role of capital in the regional growth

¹ A distinction is made between the concepts of economic growth and development. Economic development is viewed as defined by Todaro, as a process of reducing poverty, inequality and unemployment within an economy experiencing growth, as measured by increases in income per capita. This study, however, is based on theories of economic growth, rather than the broader theories of economic development.

process and their approaches are discussed below.

Douglass North focused on the forces of demand encouraging economic growth. The export base theory posited by North emphasizes the importance of external demand for a region's products in generating economic growth and, therefore, income within the region. He noted that in the early stages of growth, capital for investment must be drawn into a region from outside, since regional income is not at the level required to support savings and capital investment. As regional income increases, led by the export sector, internally generated capital can begin to replace external capital for regional investment.

This latter point is particularly important for the present study. The need to channel capital into a developing region as a means of encouraging economic growth requires a capital market capable of serving this channeling function. In light of the role of capital in regional growth described by North, it is important to consider the structure of the financial markets which serve as channels for the movement of capital in the economy. Specifically, the role of commercial banks in supplying capital for rural economic growth becomes important to accurately identify.

While North's theory primarily takes a demand orientation, other authors have disagreed with such a narrow approach. Hartman and Seckler have argued that "the sine qua non of economic growth is the act of investment" (p. 168). In this sense, they focused on capital in

the investment process, as did North. They differed, however, in that they viewed investment, a component of regional income, as consisting of two parts--autonomous and induced. They proceeded to argue that not all investment arises from export activity, i.e., the investment is induced. It should be pointed out, however, that the different emphasis given to export activity in these two approaches may result from the time frame used in the analysis, rather than from a fundamental difference in the processes at work. North recognized the importance of autonomous or internal investment, in the long run. Eventually, he anticipated a substitution of internally generated capital for external capital. In this sense, North recognized, as do Hartman and Seckler, the importance of autonomous investment to the process of growth.

Hoover, however, questioned the strictly demand oriented approach to the regional growth process by examining the potential immobility of capital. Hoover cited the mobility of capital, along with trade and migration, as factors influencing the growth rate of a region. Several factors affect the mobility of capital including expected rate of return, inertia, ignorance about regional investment opportunities, and social distance, i.e., the extent to which an area in need of capital is separated by cultural differences from areas where investors are located. In addition, Hoover noted that the "beaten-path effect," familiar to labor migration patterns, may hold for capital movements as well. Capital is more likely to move into an area where previous

investments have been made and the investment climate is a known quantity. The five factors cited by Hoover as affecting capital mobility are relevant to this research. These factors are likely to coexist in rural areas, thus compounding the capital mobility problem. Again, the role of financial institutions in enhancing capital mobility in rural areas becomes an important factor in understanding regional economic growth.

Hoover's discussion of regional economic growth pointed out the importance of both supply and demand factors in determining a region's growth rate. Demand for a region's products or outputs continues to be an important determinant of growth, as suggested by North. But, the supply of inputs, particularly capital for investment, also plays an important part in enhancing or hindering growth.

The role of capital, as described in Hoover's theory, is pertinent for this research. Capital, whether internally or externally generated, is a primary factor influencing regional economic growth. In particular, concern lies with the mobility of capital and the factors affecting this mobility. The issue of capital mobility, in turn, leads to consideration of the institutions primarily responsible for mediating the flow of capital among regions and individuals in the economy.

From a national perspective, the establishment of financial markets to facilitate the efficient allocation of capital among economic sectors was a necessary precursor to the early expansion of the national economy. Davis and North looked at the development of financial intermediaries in

the United States from the perspective of institutional innovation.

According to Davis and North,

"At no time in our history was the United States without some capital market arrangements; however, those that existed in the early years were not only primitive, but were inclined to be tied to particular places and particular types of economic activity. The farther apart were savers and investors, the greater the potential profits that could be realized from the movement of finance across the regional and industrial boundaries"(p. 108).

It was the potential for returns on investment that led to the creation of financial intermediaries, a role assumed primarily by the government in the early 19th century. Investments in western development by eastern capitalists were not readily made at this time because of the failure of existing financial markets to provide appropriate information about western investment prospects. As a result, the federal government stepped in and, through the sale of government bonds, was able to finance such large-scale investments as an east-west transport system.

According to Davis and North, the financial intermediary role, played by the government in this case, served two primary functions.

First, capital accumulation was enhanced by factors which led to increasing the rate of return to savings, reducing the risk associated with savings and investment through portfolio diversification, and reducing uncertainty created by the lack of a financial market.

Second, capital mobility was created by moving capital from capital-surplus areas to capital-deficit areas. In the example cited above, this movement was from east to west.

While the government served adequately as an early financial intermediary, it was replaced, at least in importance, in the mid-19th century by a private sector institutional innovation with government support, the commercial bank. Commercial banks were able to capture greater profits through further increases in both the accumulation and mobility of capital. They continue to be the major private sector force in financial intermediation today. Their innovation served to improve the efficiency (i.e., reduce transaction costs and other market imperfections) of financial markets by providing information to both savers and borrowers that was previously costly, if not impossible, to obtain. In addition, while the government tended to finance large-scale public infrastructure projects, commercial banks financed, although with some lag, smaller scale economic activities. Examples cited by Davis and North include commercial bank financing of short-term commercial loans, home mortgages, consumer credit, and, eventually, long-term manufacturing credit. It is commercial bank support for these types of economic activities that makes them an important factor in economic

development, particularly for isolated rural areas which may have limited access to other sources of external capital.

This discussion describes from a theoretical perspective the importance of both investment capital and the financial intermediaries responsible for channeling that capital in the process of local economic growth. It is important to identify what role financial intermediaries, particularly commercial banks, have actually assumed in local areas, as a means of testing the theory described above. The following review of literature provides empirical evidence of the important role commercial banks play in financing local economic growth, thus substantiating the theoretical description of that role provided above.

Review of Literature on Rural Fund Availability and the Role of Commercial Banks

The earliest comprehensive study of capital availability (the supply of funds for capital investment in both the private and public sectors) in a rural region was performed for the Appalachian Regional Commission in 1969 (Checchi and Company). The study was comprehensive in that it considered the supply of funds available through banking institutions, as well as the demand for capital in the local area. The study surveyed banks operating in Central Appalachia and concluded that there were underutilized capital resources in the Central Appalachia region that could have been made available for local investment. This underutilization occurred, according to the study,

due to banking practices which led to loan to deposit ratios² maintained at levels less than the national average and the percent of deposits held in government securities³ maintained at levels greater than the national average. The study concluded from this evidence that a capital channeling, not availability, problem existed, thus placing a strong focus on the importance of local banking practices in meeting capital needs.

More recent research conducted in Wisconsin found similar evidence corroborating this earlier work (Shaffer). In a 1975 study of rural Wisconsin banks, sample bank operating ratios were compared to the same ratios for all banks in Wisconsin and in the U.S. Shaffer found similar conservative banking practices on the part of rural bankers in the sample, i.e., low loan to deposit ratios and high levels of liquidity. He noted that banks face a tradeoff in their allocation decisions. Placing assets in less risky, more liquid government securities represents a non-local use of funds that may prove to be profitable for the banker and represent portfolio diversification; yet,

² Loan to deposit ratio serves as a measure of the extent to which deposits from the community are placed into loans. A higher loan to deposit ratio is assumed to benefit the local community, since it is presumed that most loans made by a local bank are within its service area, i.e., typically the county in which it operates.

³ The percent of deposits or assets held in government securities is a measure of the liquidity achieved by the bank. Government securities are low risk, short-term investments which allow the bank to earn a rate of return while having virtually instantaneous access to the money as needed. Such investments, however, do not serve to promote job or income creation in the bank's service area and are, therefore, viewed as a capital drain on the community.

such an allocation does not serve as a stimulus to local economic growth.

The two studies reviewed above describe the role played by commercial banks in rural areas as reflected in operating or performance measures. These studies are limited in that they do not consider the underlying institutional or behavioral context that gives rise to bank performance. A more thorough understanding of bank behavior can be gained by considering the institutional context.

Work by Staniforth and Haggard in Wisconsin addressed an institutional problem affecting the availability of funds in rural areas. Currently, most rural banks, because of their relatively small size, engage in correspondent relations with a larger, typically metropolitan bank. While such a relationship provides the smaller bank with numerous services, particularly the ability to cooperate on loans above their legal lending limit, there are costs associated with this system. Specifically, in return for these services, rural banks must maintain compensating balances with their correspondent bank. These funds are, therefore, no longer available to the rural bank to meet its local capital demands. Critics of this system have noted that these balances tend to be excessive due to the better bargaining position of the correspondent bank and that a fee system might prove to be more equitable, allowing more funds to remain with the rural bank. The authors pointed out that the current trend is toward establishing a fee system for correspondent services.

The research reviewed above suggests that capital is typically available in rural areas to meet local demands. However, it is possible that these demands may not always be met due to behavioral or institutional constraints evident in rural capital markets. The conservative banking practices observed in some rural bankers, i.e., relatively low loan to deposit ratios and relatively high proportions of low risk assets in their portfolios, and the potential constraints placed on banks by the existing correspondent system serve to inhibit the channeling of available capital to meet local demands. The extent to which such restrictions on the flow of capital in rural areas continue today and affect local economic growth and development remains an important research issue.

There has been some limited research to determine the role that commercial banks play in the economic development process, particularly in rural areas. Sullivan's study considered commercial bank support for nonmetropolitan municipal bonds, an increasingly important debt financing tool for local governments seeking to meet the increased service demands associated with population turnarounds and economic growth in rural areas. He analyzed national trends in bond markets for metropolitan and nonmetropolitan government issues. Problems arise for small nonmetropolitan areas because their bonds tend to be relatively small and unrated or unfavorably rated, making them a greater risk to purchasers. Commercial banks, particularly rural banks, have been the

major purchasers of nonmetropolitan bonds in the past and are the likely candidates for expansion of support for nonmetropolitan issues in the future. However, there are institutional barriers to such an expanded role. Increasingly, nonmetropolitan issues are revenue, not general obligation bonds⁴ and, currently, commercial banks are prohibited from underwriting revenue bonds. This underwriting role requires the bank to guarantee the purchase of the bond issue. Without a change in these regulations, the ability of banks to expand support for nonmetropolitan issues is in question.

According to Sullivan, this presents additional problems for nonmetropolitan areas because local banks are in the best position to help improve the marketability of nonmetropolitan issues. These issues typically have higher costs than metropolitan issues because of their small size, poor ratings, and lack of technical expertise in packaging the issues on the part of local government officials. Commercial banks, operating within the local area, are in an ideal position to offer assistance to the municipality to better market bond issues. However, Sullivan noted, such assistance may require the sacrifice of bank profits in the short-term to promote long-term community economic development and, ultimately, long-term bank profitability.

⁴ Revenue bonds are backed by the revenue-generating capacity of the capital project financed, e.g., hospital, public recreation facility. General obligation bonds are repaid from general tax revenues of the municipality or county.

Regulatory change may be necessary to give local banks the ability to assist their community in this manner. Even with such changes, however, bank support may not be forthcoming. Sullivan found weak support by banks for the local rural bond market that might hinder rural development. However, whether this was due to a lack of support by the banks or a lack of local bond issues was unclear. Such a distinction must be made to determine what role banks do play in promoting economic development via the local government sector. It is not possible to determine the distribution of municipal bonds, by location, in a metropolitan or nonmetropolitan bank's portfolio, with currently available data. Additional information must be acquired to determine local bank support for local bond issues.

Another study considered this issue by focusing on the small business sector (Hooker). The author pointed out that commercial banks are the primary source of capital for the small business sector which, in turn, plays an important role in generating economic growth through increases in employment and, consequently, income. Hooker noted, however, that support for long-term commercial lending has increased among bankers only since World War II and this support may vary depending upon the organizational structure of a bank, i.e., independent vs. affiliate of a larger banking unit. He argued that affiliates can increase the efficiency in a rural financial market because they are associated with a larger financial network, reducing the size of the minimum market area needed for efficient operations. In addition,

affiliates proved to be no more conservative than their independent rural counterparts and were typically less risk averse and less conservative. This study suggested not only the importance of commercial bank support for the small business sector as a factor influencing economic growth, but also the potential importance of the organizational structure of the financial market as a factor in the economic growth process. This issue becomes particularly critical as the impact of financial deregulation is considered.

Another study by Combs, Pulver, and Shaffer found that commercial banks play a significant role in a rural community's small business economy in Wisconsin. For the sample of businesses interviewed, banks supplied almost 80 percent of the loans required by small businesses. In addition, for small businesses organized as corporations, banks provided a major source of equity capital. When businesses were asked to rate banks and other credit sources as to how well they met their credit needs, there was general satisfaction with the availability of credit. The dissatisfaction which was expressed related to the performance of the banks. Criticisms most often expressed related to the size of a bank and resulting limitations on credit, as well as dissatisfaction with the bank's unsympathetic and/or uninformed attitude toward particular types of business operations.

This study provided evidence in support of the important role commercial banks play in financing rural economic growth. However, it

also pointed out some potential problems with commercial bank support of small businesses and showed the relative importance of other sources of credit to small business financing. A study conducted in Oregon by Stevens, Bunch, and Soth pointed out the potential importance of these other sources of finance for the small business sector. Equity from a previous home was the largest single source of financial capital for almost half of their sample of new business starts. Personal funds from various sources accounted for 58 percent of the total value of capital for the entire sample. Business loans, primarily from local banks, accounted for the other 42 percent. Most respondents had little trouble receiving financing from the loan sources they approached and some limited use was made of Federal support agencies, e.g., Small Business Administration.

The studies reviewed above provide evidence that (1) commercial banks play an important role in financing rural economic activity and (2) this role may be influenced by other local or national credit sources and the extent of their availability in a local capital market. Both regional growth theory and the literature reviewed above support the assumption about the important role played by commercial banks in financing rural economic growth. From this basis, then, the primary research issue of the impact of financial deregulation on nonmetropolitan capital availability can be addressed by discussing its theoretical basis and the literature relevant to this topic.

Theoretical Basis for Determining the Impact of Financial Deregulation
on Capital Availability

The primary research objective of determining the impact of financial deregulation on nonmetropolitan capital availability has its theoretical underpinnings in regional economics and the theory of institutional innovation posited by Davis and North. To determine the impact of financial deregulation on capital availability, however, it is necessary to begin with a discussion of the assumptions underlying general equilibrium analysis and their relevance to analysis of rural capital markets. As mentioned above, market imperfections may exist in rural capital markets and deregulation must be viewed in this light. The following section explores these market structure issues in greater depth.

General Equilibrium Analysis, Regional Economics, and Market
Imperfections

Consideration of the general equilibrium conditions of production and exchange gives rise to three marginal conditions for a Pareto optimal, or efficient, allocation of resources in the economy. First, the marginal rate of substitution between any pair of consumer goods must be the same for all consumers. Second, the marginal rate of technical substitution between any pair of inputs must be the same for all producers. And, third, the marginal rate of transformation in production must equal the marginal rate of substitution in consumption

for all pairs of commodities and all individuals (Ferguson and Gould). If all three conditions are met, a Pareto optimal resource allocation is achieved. It is also shown that these conditions are met in a perfectly competitive market economy and, therefore, such a perfectly competitive economy guarantees attainment of a Pareto optimal resource allocation. However, to describe the operation of any particular economy as necessarily Pareto efficient, the assumptions underlying perfect competition and the characteristics of a perfectly competitive market must hold. The market must be characterized by many buyers and sellers, each too small to influence price; homogeneous products; perfect mobility of all resources; and perfect knowledge by all individuals involved in market activity. In addition, Ferguson and Gould note that an analysis of perfect competition assumes that all entrepreneurs attempt to maximize profits and that the operation of firms is not subject to outside control.

It was pointed out in the previous section that in this current research into the functioning of rural capital markets, all of the assumptions of perfect competition may not hold. In particular, Hoover's discussion leads one to question the assumption of perfect capital mobility. And, past regulation of the banking industry has fixed prices, i.e., deposit interest rates, and restrained entry into the banking market, therefore confronting the industry with a relatively large degree of outside control. Finally, whether or not profit maximizing behavior is characteristic of all banking firms, regardless of

size or organizational structure, remains subject to empirical verification.

Given that there appear to be some potential imperfections in rural capital markets, it is not valid to assume that a Pareto efficient resource allocation is necessarily achieved by the workings of such a market. The existence of imperfections in local capital markets suggests that Davis and North's theory of institutional innovation may provide an appropriate theoretical framework for consideration of the primary research objective.

Theory of Institutional Innovation

Davis and North argued, based on historical analysis, that "an institutional arrangement will be innovated if the expected net gains exceed the expected costs" (p. 10). Such a change might occur to capture economies of scale, reduce transaction costs, reduce risk, or, in other ways, overcome the imperfections of an existing market structure. They argued that "the possibility of profits that cannot be captured within the existing arrangement . . . leads to the formation of new (or the mutation of old) institutional arrangements" (p. 39).

To apply this theory to the issue of deregulated rural financial markets, it is necessary to consider the initial equilibrium situation in these markets, suggested by the market imperfections discussed above.

This equilibrium situation would be characterized by capital immobility as described by Hoover. This immobility suggests that potential returns to capital investment in rural areas may not be realized as a result of the lack of information regarding these investments, the greater risk perceived to be associated with rural markets, or the inertia that tends to keep capital in urban centers as opposed to flowing into relatively unexplored rural capital markets. It would appear that profits might be captured by changing the existing market structure to include financial institutions that are in a position to be less risk averse and to have access to larger pools of capital, i.e., affiliate banks. The suggested increase in the number and importance of affiliate banks relative to independent banks as a result of deregulation can be adequately explained by this theory of institutional innovation.

Another factor affecting the existing financial market structure in rural areas is access to information. Independent and affiliate banking institutions, in the same market, are likely to have unequal access to information about banking innovations and market changes. Affiliate banks typically have access to a greater pool of information, at lower cost, through their association with the parent company. These holding companies usually have a research staff that can generate and disseminate valuable and timely market information. Many independent banks, however, are smaller in size and do not have the staff to devote to such information processing. Therefore, their ability to benefit from market information may be hindered by both timing and cost.

Viewing this situation from the perspective of institutional innovation, an equilibrium in the current market structure would most likely be achieved until, as Davis and North suggested, some external factor caused a disruption in that equilibrium. One possible factor would be a legal or political change that gave rise to an institutional environment in which some group saw the potential for redistribution of returns. In the present case, the legal and political change affecting the financial market is deregulation. Large bank holding companies, such as Citicorp, led the drive for deregulation in order to protect themselves from nonbank competitors, particularly mutual funds. In addition, the political climate was right for a reduction in regulations. As a result, the holding companies were able to take an active role in changing the market environment to one in which their particular institutional organization was most profitable.

In the current environment, with new deregulated "rules of the game," the value of market information would appear to increase and with it the cost associated with not having access to timely information. The theory of institutional innovation would predict an increase in arrangements that take advantage of any economies of scale associated with the acquisition and dissemination of information. Given the current structure of financial markets, it appears that the result would be an increase in the number of banks affiliated with large bank holding companies. This result is in line with that predicted by other bank researchers.

It is evident that the theory of institutional innovation provides a basis for interpreting the changes in market structure expected to occur with deregulation of financial markets. Drawing on this theory, it could be suggested that the two institutional arrangements, independent banks and affiliate banks, are likely to have distinct behavioral or decision making structures. The assumption of such differences is based upon the view that affiliate banks represent an institutional innovation that occurs as a result of the perception that this new arrangement has the potential to capture greater profits than the old form of independent banks. This ability to capture greater profits is assumed to occur as a result of some difference in the institutional structure that underlies the performance of affiliate banks relative to independent banks. This research is designed to determine if these differences actually exist.

While the theory of institutional innovation provides the basis for understanding why structural changes may occur in bank markets as a result of deregulation, the theory of oligopoly is used to suggest possible changes in capital availability that may occur as a result of increased concentration in rural financial markets. It has been suggested by several researchers that deregulation will result in a small number of large banks controlling the financial services industry of the nation. This structure, in turn, might assume the characteristics of an oligopoly. Several studies described below found evidence that

increased concentration in bank markets led to higher prices and reduced services, suggesting a less than perfect market structure. Therefore, the workings of such a market structure are of interest in this study.

Oligopoly Theory

The predictions of oligopoly theory are not as definitive as those from either the theory of perfect competition or monopoly organization. The oligopolistic structure falls somewhere in between these two extreme forms of market structure and the predictions of oligopoly theory regarding firm behavior tend to be intermediate as well. According to Scherer, "any realistic theory of oligopoly must take as a point of departure the fact that when market concentration is high, the pricing decisions of sellers are interdependent and the firms involved can scarcely avoid recognizing their mutual interdependence" (p. 168). Therefore, in analyzing the structure of any particular market, an important consideration is the degree of concentration in the market and whether or not an oligopolistic situation results. This is an important point from the perspective of the impact of deregulation on bank market structure and is explored frequently in the popular press.

There are many models of oligopoly, generating different predictions, but there are some basic consistencies. First, there is no reason why the oligopoly output should necessarily correspond to long-run minimum unit cost, as in the perfect competition case. If this does

not occur, less output is produced than buyers are willing and able to purchase and resource misallocation occurs. Second, oligopolistic firms rarely engage in price competition, relying instead on nonprice competition to draw market share away from their rival firms. As a result, prices tend to be higher than under perfect competition and resources are allocated to nonprice forms of competition, e.g., advertising, design differences, etc., a phenomenon less likely to occur in a perfectly competitive or monopolistic market. Empirical evidence suggests that this nonprice competition goes "beyond the socially desirable limits" (Ferguson and Gould, p. 359). If this is the case, further resource misallocation occurs.

Given the characteristics of an oligopolistic market structure, the issue of potentially increased concentration in the banking industry as a result of deregulation takes on particular significance. The industrial organization literature has insights to offer regarding both the present degree of concentration in banking markets, as well as anticipated impacts from deregulation. Several studies are described below to clarify these structural issues.

Empirical Evidence from Industrial Organization Studies.

"Economic theory posits that a relationship exists between market structure and the performance of firms in the market" (Heggestad and Mingo, 1977, p. 649). The authors looked at the level of concentration in local banking markets (SMSAs) and its impact on prices (car loan

interest rates and demand deposit service charges). They found that higher concentration levels led to higher prices and concluded that "effective monopoly" may exist in banking. By looking at concentration levels in SMSA and non-SMSA counties, they concluded that, in general, banking markets were highly concentrated. Smaller rural areas tended to be more concentrated than metropolitan areas and 13.3 percent of all non-SMSA counties were completely monopolized by a single bank. Heggstad and Mingo extended their analysis to determine the impact on market concentration of expanding the powers of thrift institutions to increase their ability to compete with commercial banks, one component of deregulation. They predicted a decline in concentration levels in banking markets, but the decline might or might not be great enough to reduce the "effective monopoly" in the banking market. They concluded that adoption of policies that result in major declines in concentration can have important price reduction benefits and, therefore, should increase social benefits.

Other research by Bell and Murphy found a similar positive and significant relationship between concentration and price in banking markets. The authors pointed out a regulatory dilemma created by this relationship that is deemed to be important to the current research. They noted that "since economies of scale exist in banking, increasing the average size of firm within a market area by merger will lower costs which should reduce prices, but the merger will also bring about increased concentration and higher prices. The net result depends

upon the relative magnitude of these two influences" (p. 213). This tradeoff between cost efficiency and concentration is important from the current research perspective, since the differences between affiliate and independent bank behavior are addressed.

Finally, Heggstad and Mingo (1976) used multiple regression analysis to determine the relationship between concentration and a range of prices and other specific aspects of nonprice competition. They hypothesized that market structure influences the firm's desire to compete for customers. Specifically, they assumed that the greater the monopoly power in a market, the higher would be bank prices and the worse bank services, due to the lack of competition for customers in this area. They tested this hypothesis by surveying SMSA banks and using regression analysis to determine the impact of various concentration measures on price and nonprice variables. The authors concluded that a statistically significant relationship exists between concentration and prices or services in commercial banking. They also found that for some price and service variables, this relationship was not linear, but curvilinear. Such a relationship suggests that increasing concentration in a relatively unconcentrated market may have a greater influence on prices and services than increasing concentration in a market that is already highly concentrated. They noted that "bank performance can be significantly reduced by actions that increase concentration in banking markets. Moreover, regulators should be at least as wary of mergers in relatively unconcentrated markets as in relatively concentrated markets" (p. 116).

While the studies reviewed above found evidence of a significant positive relationship between bank market concentration and price, this research addresses the issue of concentration as it relates to bank performance in several areas, lending, profitability, risk taking, and capitalization, not price alone. There is not the body of empirical evidence to draw upon in determining the relationship between concentration and nonprice performance, as measured by selected bank operating ratios. Therefore, it is necessary to determine what relationship, if any, exists in nonmetropolitan bank markets in Virginia. An analysis of aggregate bank data to address this issue for the state of Virginia is described in Chapter IV.

To determine the impact of deregulation on rural financial markets, this research draws upon the theories of general equilibrium, institutional innovation, and oligopoly markets. General equilibrium theory sets the stage by suggesting that market imperfections may be an integral part of rural financial markets. Institutional innovation provides the basis for considering why the structure of financial markets would be expected to change in a deregulated environment and provides support for the expectation that a relative proliferation of affiliate banks will occur. Finally, the theory of oligopoly markets suggests possible impacts that increased concentration of banking resources might have on the price aspects of bank performance. The following section reviews the literature relevant to the investigation of the impact of financial deregulation on rural capital markets.

Review of Literature Concerning the Impacts of Financial Deregulation

There are several ways in which the impacts of financial deregulation⁵ are addressed in the literature. First, several studies predicted some general changes in the structure of capital markets that might occur following deregulation. There was some consensus that deregulation might lead to a greater centralization of financial markets and, thus, bank decision making (Struck and Mandell, Nyankori and Miller). Such centralization generally implies the existence of fewer independent banks and more banks affiliated through merger. There was disagreement, however, over whether or not small banks could continue to compete with large banks, affiliates or independents, in this new environment. In a study completed prior to deregulation, Rhoades and Savage showed no competitive disadvantage for smaller banks relative to larger ones. However, follow up work by Savage questioned the extent to which small banks and thrift institutions can effectively compete for more costly deposit funds once the Regulation Q interest ceilings on deposits are removed.

⁵ According to Cargill and Garcia, the overall objective of the financial reform achieved through the 1980 Depository Institutions Deregulation and Monetary Control Act was to move the financial system toward a more competitive situation. The three major changes in the act leading to greater competition are (1) removing interest-rate ceilings on deposits, i.e., eliminating Regulation Q, (2) widening the sources of funds for financial institutions via NOW accounts and share draft accounts, which represents a significant inroad by nonbanks into a bank market, and (3) expanding uses of funds and other powers for financial institutions by reducing restrictions on lending activities, particularly for thrift institutions.

There was similar disagreement about the impact of increased centralization and merger activity on capital availability. One study argued that more liberal banking laws can be favorable to small business by improving the competitive environment, particularly in rural areas (Glassman). Similarly, it was argued that allowing mergers within the state did not lead to anti-competitive activities or price changes and tended to promote maximization of the total social value of the state's resources (Benston). Other studies put forth conflicting results, suggesting that such structural changes might make banks less flexible and responsive to local capital demands and might increase the cost and restrict the terms on which funds for rural development are obtained (Struck and Mandell, Nyankori and Miller).

It must be emphasized here that the conclusions reached by these studies were based typically on analysis of bank operating ratios, e.g., loan to deposit ratios, federal funds carried in the portfolio, etc. The underlying behavioral conditions of the bank were not addressed, nor were institutional constraints that might arise due to a particular type of bank organization, e.g., affiliate bank. It is maintained that these factors may contribute significantly to overall bank operation in a rural area and must, therefore, be addressed. This research in Virginia is designed to address these behavioral and institutional issues.

While there was general agreement among researchers about the nature of structural changes expected to occur following deregulation, thus far research has failed to address the issue of the impacts of such changes on capital availability particularly in rural areas. It may be the case that such impacts must be determined on a region-by-region basis and that they vary depending upon the existing institutional structure of the financial market and the economic structure in a given area. For this reason, this study focuses on the state of Virginia and attempts to address the issue of impact under the circumstances peculiar to this state.

Second, given some agreement about the structural impact of deregulation, i.e., an increase in affiliate banks associated with a demise in independent banks, numerous studies have attempted to determine important differences in the operating behavior of affiliate banks compared to independent banks. Any differences in operating behavior might then be translated into differential impacts on capital availability in local areas. A significant contribution was made by Kolb in determining that "because of differences in regulatory environment and the resulting corporate structure, affiliated and independent banks may be viewed as two quite different types of financial institutions" (Kolb, p. 536). Kolb looked at all national banks for the years 1975-1976. He did not control for size in comparing independents with affiliates, but did include a dummy variable in the analysis to reflect the bank's metropolitan or nonmetropolitan location. Using multiple

regression analysis, he showed that affiliates had lower capitalization levels and lower rates of capital growth than did independents. They tended to pay higher dividends and incurred greater operating expenses than did independents. Kolb argued that these differences were based on the different organizational structures. Lower capitalization resulted from the fact that there are regulations on the flow of funds from affiliate banks to the parent holding company. However, the flow of capital from the holding company to their affiliate banks is not restricted. Capital was retained, where possible, at the holding company level to provide the holding company with maximum flexibility in allocating capital. In addition, flows from the affiliates to their parent company tended to be hidden as dividends or fees for services rendered, i.e., operating expenses. This practice, according to Kolb, explained the higher operating expenses found among affiliate banks, as well as their higher dividend payments.

These differences might imply differential impacts on capital availability in a local area. The holding company appeared to be the primary claimant of the affiliate's capital, according to this scenario. This implies greater flexibility for independents in making their capital allocation decisions. There may or may not be more capital available for local activities under an independent regime, depending upon how responsive the holding company enables its affiliates to be to local capital demands.

While there appears to be an edge given to independents in terms of flexibility, this must be balanced against an important factor discussed by Kolb--affiliate banks were less risk averse and chose more risky portfolios and higher leverage than did independents. Such behavior might prove advantageous for rural areas where capital investments, e.g., municipal bonds, are often viewed as being high risk, primarily due to the uncertainty associated with rural economic investment opportunities. It is possible that affiliate banks' greater risk tolerance may offset any disadvantages resulting from lower capitalization levels, thus yielding net benefits to a local economy. This tradeoff between flexibility and risk aversion can be tested empirically to better determine the impact of organizational structure on capital availability. According to Kolb, "the optimal protection of the public interest by regulatory authorities necessitates a greater sensitivity to the alternative behavioral regimes under which these two kinds of banks operate" (Kolb, p. 536). This research should provide further clarification of this issue in Virginia.

The results of several studies comparing affiliate and independent banks supported Kolb's finding of less risk aversion among affiliates, but did not support his findings on capitalization (Rose and Fraser). Affiliates had lower ratios of cash and government securities to assets, indicating less concern with liquidity, than did independents. The affiliates also had higher municipal securities and loan to asset ratios, indicating that affiliates might supply greater credit support for local

governments, business, and households. However, a conclusive statement cannot be made without identifying to whom such loans were made and what bond issues were carried by these banks.

These studies showed no significant differences between affiliate and independent banks in terms of capitalization rates, but did show higher levels of "other" expenses, which would include payments to the parent company. The results concerning capitalization neither supported nor contradicted Kolb's findings.

To better determine performance differences between affiliate and independent banks, Snider analyzed the lending behavior of rural banks in Virginia that had merged with large urban banks during the 1962-1968 period. He compared the loan portfolios of these rural banks before and after their affiliation with a larger, urban banking institution. He looked at several operating ratios: Gross Loans/Total Deposits; Real Estate Loans/Total Loans; Farm Loans/Total Loans; Commercial and Industrial Loans/ Total Loans; and Loans to Individuals/Total Loans. His results showed no significant difference in the pre- and post-merger lending behavior of rural banks. He concluded that changes in Virginia banking laws to allow such mergers did not affect credit availability in rural areas.

While most of the studies reviewed above described a pre-deregulation situation, their results provide some support for the conclusion that affiliate and independent banks are separate types of

institutions, with differing behavioral regimes. Snider's study indicated that differences in lending patterns were not significant, but it is possible that other differences, such as in capitalization levels and decision making flexibility, may lead to different impacts on local areas, particularly rural areas. If deregulation results in a proliferation of affiliate banks, it is essential to know how behavioral differences that characterize affiliates may affect local areas. Then, the advisability of such deregulatory moves from the perspective of local, rural areas can be ascertained. Completing such an analysis for Virginia is a primary objective of this research.

Third, although current attempts at deregulation have failed to result in an easing of geographical restraints on banking, i.e., interstate banking, the Reagan administration supports such efforts and discussion is ongoing. One study pointed out the potential paradox in such a move (Rhoades, January 1980). Economic theory supports the reduction of any barriers to entry as a means of fostering competition. From this perspective, allowing interstate banking is viewed as a pro-competitive move. However, Rhoades noted that the experience of states that reduced geographical restraints by easing branching and merger restrictions showed that lowering barriers to entry had an adverse impact on state banking structure. In New York and Virginia, the share of total deposits accounted for by the three largest banks increased from 1961 to 1969, following the liberalization of branching laws. The increase in New York was 2.4 percentage points, while the increase in Virginia was 14.2 percentage points.

Rhoades suggested that such evidence supports the view that a move toward interstate banking will lead to an increase in the concentration of ownership of banking resources in the U.S. Such increases in concentration are often associated with monopolistic behavior, i.e., reduced output and higher prices, clearly a result not favored by an appeal to a free market in banking. While interstate banking is not part of the present deregulation package, its example indicates the role regulations may play in improving the functioning of capital markets by promoting more widely distributed and less concentrated financial services. It is important that the local economic impacts of deregulation be identified to allow appropriate public policy decisions to be made.

Another study conducted in Arizona and Colorado showed that the unlimited branching structure in Arizona resulted in an increase in loanable funds and competition in nonmetropolitan areas, as compared to the unit banking structure in Colorado (Barkley, Potts, and Mellon). The authors used multiple regression analysis to determine whether differences in bank credit allocated to nonmetropolitan areas, i.e., loan to deposit ratios, and in market rivalry, i.e., market concentration measures, were due to differences in state banking structures. They concluded that rapidly growing nonmetropolitan areas would experience an increase in credit availability under statewide branching, while slower growing areas would see a decline in loan to deposit ratios.

They argue that "the allocation of loanable funds among nonmetropolitan communities may be more efficient under branch banking than an alternative banking system" (p. 21).

It should be clear from the literature reviewed above that (1) the impacts of financial deregulation are not well understood and (2) the specific and, potentially, differential impact on rural capital markets must be more fully considered. Several approaches described above provide much useful information for determining these potential impacts and should be incorporated into future research efforts. The current study incorporates aspects of previous research methods, while expanding the approach to identify behavioral components of the banking industry. Such an approach should result in a more in-depth understanding of the potential impacts of deregulation and the extent to which these impacts may influence, positively and/or negatively, the role of commercial banks in rural economic growth.

Summary

The first part of this chapter established the theoretical and empirical foundations for attributing importance to the role of commercial banks in the rural economic growth process. A regional economics perspective is required, since the analysis is conducted on a sub-region of a larger economy--nonmetropolitan counties in Virginia. It is clear, from the literature, that an important consideration in examining the process of rural economic growth is the role of capital as a factor in

that process. In analyzing the capital formation issue, the role of commercial banks in facilitating the flow of capital is important to accurately identify. At the same time, macro policy changes may have an important influence on the role of financial intermediaries at the local level. It is important to consider the structural changes that may occur in local financial markets as a result of such policy changes as the current financial deregulation. For this reason, the theory of institutional innovation and oligopoly theory are drawn upon to provide the theoretical rationale for consideration of the hypotheses dealing with the behavior and performance of commercial banks in rural markets. It is important to remember that these hypotheses are designed to provide an in-depth analysis of the possible changes in the role of commercial banks in financing rural economic activities as a result of the macro policy changes stemming from financial deregulation.

Chapter III

The Methods

This research combines a case study approach with an analysis of aggregate banking data for Virginia. The first section of this chapter provides the justification for the case study and describes the relationship between the case study and aggregate analyses. The next section describes the procedures for testing the behavioral and performance hypotheses. Finally, the methods are summarized and some research applications are discussed.

The Case Study Approach

There are several reasons why a case study approach was selected for this study. First, the interview technique used to test the behavioral hypothesis was designed to identify any important differences in the decision making process used by independent bankers as compared with affiliate bankers. Analysis of aggregate bank data at the state or even county level cannot provide insight into how bank performance measures are generated. It is the decision making process underlying bank performance that is most likely to be influenced by local conditions and that may hold the key to understanding how different types of banks operate within a local economy. In order to determine how bank decisions are made, it was necessary to identify the

bankers' operating goals, as well as their relevant operating constraints. In order to accurately model the bankers' decision making process, the questionnaire was administered in a personal interview, rather than through a mail or telephone survey. The choice of this technique required that the sample be small to meet time and monetary constraints. However, for the purposes of this study, the quality of information gained through personal interviews was believed to be superior to what could have been obtained via mail or telephone.

Second, the case study approach was designed to be consistent with a sampling scheme that controlled for relevant economic variables. By controlling for factors such as bank asset size and economic structure, any differences observed between independents and affiliates can be attributed with greater confidence to their different institutional structures. The sampling procedure resulted in relatively few counties meeting the stringent criteria for sample selection. These selection criteria were designed to control for bank size, organizational type, and economic conditions. Hence, only those counties with both independent and affiliate banks in the same size class were eligible for the sample. As discussed, only six counties met those criteria and in only three counties was full participation of the chosen banks obtained. The results of the bank interviews obtained from such a small sample must be treated as case studies and cannot be construed to represent the behavior of all banks in Virginia.

Third, this research takes a different approach to analyzing the banking industry than other studies that focus solely on bank operating performance. By focusing on the decision making process underlying bank performance, more insight can be gained into the institutional aspects of banking structure and performance. A case study approach was viewed as an appropriate means of testing a new application of the lexicographic ordering technique. It is hoped that by using a case study approach, this research can provide a more in-depth understanding of the operation of a local financial market and will identify any differences in decision making which may result from differences in the organizational structure of a bank. In turn, this information can be used to suggest whether the changes assumed to result from financial deregulation lead to local financial markets which are more or less responsive to the capital needs of the participants in the local economy. The results of this case study analysis may suggest the need for a wider application of the methods used in this study in the future.

In spite of the merits of a case study approach, its limitations are recognized. In particular, the results of this analysis cannot, in the absence of other information, be considered representative of bank behavior, even within Virginia. For this reason, the case study is combined with a discriminant analysis of data for all Federal Reserve banks operating in Virginia. This aggregate analysis is conducted as a means of substantiating any differences observed in the behavior of

banks interviewed for the case studies. For example, the case study may show a tendency for independent banks to place a greater percent of their loans into real estate than do affiliates. The importance of the real estate loans/total loans ratio in distinguishing between bank types in the state as a whole can be determined through aggregate analysis, thereby clarifying the observation from the case study. In this way, the aggregate analysis is used as a means of clarifying and substantiating the observations made from the limited case studies. The combination of these two approaches should increase the value and applicability of the research results.

Procedures for Hypothesis Testing

Behavioral Hypothesis

The behavioral hypothesis is designed to identify differences in the decision making process of affiliate banks relative to that of independent banks. Specifically, the null hypothesis states:

Rural affiliate bankers have the same operating goals as their independent bank counterparts.

This hypothesis is tested by applying the lexicographic ordering technique, which draws upon the theory of multidimensional utility and the associated constrained multiple goal maximization.

A lexicographic ordering technique is used in this study to determine a banker's preference structure. The application of this technique is based on the assumption that a banker has multiple goals

and that a multiattribute utility function is the best representation of a banker's preferences. This assumption was made based on the results of a pretest for this study. In this pretest, bankers' expected utility functions for money were elicited directly by applying the modified Von Neumann-Morgenstern technique (Anderson, Dillon, and Hardaker). This technique involves presenting a decision maker with a series of seven 50/50 lotteries. A certainty equivalent for each lottery is determined, in turn. Arbitrary utility values are associated with the extreme outcomes of the initial lottery and, by application of the expected utility theorem, utility values are associated with the designated certainty equivalents. In this manner, the decision maker's expected utility function can be elicited. Such a technique is considered "a more rigorous and theoretically satisfactory formulation" than the lexicographic ordering technique (Halter and Dean, p. 57).

However, when confronted with the modified Von Neumann-Morgenstern technique, the bankers were unable to consistently determine the certainty equivalent associated with a 50/50 lottery. They indicated that such hypothetical lotteries did not accurately reflect their decision making. They were unable or unwilling to determine a certainty equivalent without more information, i.e., they indicated that factors other than expected return on investment entered into their decision making as bank presidents. At the same time, the lexicographic ordering technique was applied, with favorable results. Based on this analysis, the assumption was made that bankers have

multiattribute utility functions and that these functions can be approximated using the lexicographic ordering technique. The results presented in this study substantiate these observations.

However, lexicographic ordering provides only an approximation to a continuous utility function and should not be classified as a type of utility function. Halter and Dean and Lin, Dean, and Moore describe models which apply lexicographic ordering as representations of lexicographic utility functions. Roumasset notes that such terminology is conceptually incorrect, since Bernoulli's continuity principle is violated by the lack of tradeoffs between goals in the ordering process. Thus, the lexicographic ordering applied here does not yield a utility function, but rather a preference structure which underlies decision making.

The lexicographic ordering technique has a one-to-one correspondence to constrained, multi-goal business behavior as described by Ferguson. This multi-goal behavior is described by a constrained maximization problem where the least important goal is maximized, subject to the satisfactory level of achievement for the other goals:

$$\max X_n \quad \text{subject to } X_i > X_i$$

for $i=1, 2, \dots, n-1$ operating goals

$$X_i = \text{satisfactory level of achievement for } X_i$$

If there is no feasible solution, then:

$$\max X_{n-1} \quad \text{subject to } X_i > X_{i+1}$$

$$\text{for } i=1, 2, \dots, n-2$$

Again, the X_i 's correspond to attributes or goals that are important to an overall business operating plan.

In applying this type of analysis to a test of the behavioral hypothesis, affiliate and independent bankers are interviewed to determine a lexicographic ordering of the goals important to each bank's operation. The banker is asked to first list, then order these operating goals. In addition, a satisfactory level of achievement for each goal is defined. To determine how the stated goal hierarchies correspond to actual decision making, each hierarchy is translated into a constrained maximization problem solved by using linear programming (Halter and Dean). As described above, the least important goal is maximized subject to achievement of the satisfactory levels specified for the more important goals. Then, the feasible solution is compared to the actual bank portfolio. This application enables determination of the accuracy with which the elicited preference orderings reflect actual decision making processes.

There are several shortcomings of the lexicographic ordering technique that must be addressed. First, the technique does not allow for tradeoffs between attributes. The technique "attaches dominant priorities to attributes in some specified order reflecting a hierarchy of wants" (Anderson, Dillon, and Hardaker, p. 87). While this aspect of

lexicographic ordering may limit its usefulness in some applications, the analysis does appear to provide an adequate description of banker's decision making. In pretesting this approach, bankers were generally reluctant to accept a lower return to equity, for example, in return for a higher rate of return to assets. The bankers specified their goal hierarchy and the satisfactory levels they sought to achieve. In general, these satisfactory levels appeared to be the minimum values the bankers could tolerate and still meet their fiduciary responsibilities. Given the bankers' response to the pretest, this shortcoming does not have great significance for the present study. However, the lack of tradeoffs does violate Bernoulli's continuity principle so that lexicographic ordering cannot be strictly viewed as expected utility maximization. This technique does show, however, whether a multi-attribute preference structure underlies bank decision making rather than a single attribute structure.

Second, the addition to total satisfaction from achieving a value greater than the satisfactory level for any particular goal is assumed to be equal to zero. There is no benefit to over-satisfying a goal, i.e., a one percent return to equity provides the same satisfaction as a three percent return. This assumption is unlikely to hold in a business situation where higher returns or sales, for example, are typically preferred to lower levels of these same variables. However, interest in the present study is not focused on the total satisfaction gained by a banker from selecting a particular goal ordering. Rather, the focus is

on comparing the goal orderings selected by different types of bankers to determine if differences exist. It is those differences which, in turn, may imply differences in the economic impact these banks have on the communities in which they operate. Again, this particular shortcoming presents no apparent major problem for this research.

Finally, the pretest conducted prior to this analysis showed that, given the regulated nature of the financial services industry, it is necessary to identify the important constraints under which bankers operate. To test the accuracy of the goal ordering as a description of banker decision making, the linear programming model must incorporate the major constraints faced by banking institutions. By imposing these constraints, a comparison of the feasible solution with the bank's actual portfolio is more accurate. For this reason, the questionnaire is designed to identify the constraints under which bankers operate.

Despite the shortcomings of the lexicographic ordering technique, Encarnacion and Lin, Dean, and Moore showed that it provides a more adequate description of firm behavior than a strict profit maximization approach. Encarnacion cites several business applications that are appropriately described by lexicographic ordering, i.e., where one business goal is maximized subject to achieving or maintaining certain levels for other goals. The pretest for this study also suggested that lexicographic ordering provides a suitable model of bank decision making. Bankers were able to identify their appropriate goal hierarchy

and they indicated that such a goal ordering process was in line with their decision making process. Based on the pretest results and those described by Encarnacion, the lexicographic ordering technique was chosen as an appropriate means of testing whether behavioral differences exist between affiliate and independent bankers.

In addition to the primary behavioral hypothesis, a corollary hypothesis is tested to determine one specific aspect of bank behavior--operating flexibility. This hypothesis states:

Rural affiliate banks have the same operating flexibility as their independent bank counterparts.

The assumption underlying this hypothesis is that the more concentrated, centrally controlled ownership structure found with affiliate banks inhibits decisions from being made at the local level in response to local circumstances. Such a situation is assumed to be less likely to occur in an independent bank which is not part of a larger corporate decision making structure. Data for testing this hypothesis were obtained in the personal interviews of bankers.

The results of testing this hypothesis provide evidence of the potential impacts of deregulation. If operating flexibility is dependent upon organizational structure, there may be important implications for capital availability in rural areas. A lack of operating flexibility may result in lesser amounts of capital being made available to rural areas,

particularly in times of economic downturn. Differences in the operating flexibility of affiliates and independents may have important implications for the way in which deregulation affects a rural capital market.

The questionnaire designed for the bank interviews contains three sets of questions. The first set is designed to elicit a lexicographic ordering of bank operating goals and their satisfactory levels of achievement. The responses to this set of questions provide the basis for a test of the primary behavioral hypothesis. The second set of questions is designed to determine the operating flexibility of each banker. Finally, a third set is used to identify aspects of the banking market relevant to this study. In particular, the banker's perceptions of the competitive nature of the local financial market and the potential impact of deregulation on this market are identified. The questionnaire used in the survey of bank presidents is presented in Appendix A.

Performance Hypothesis

The performance hypothesis states that:

The performance of rural affiliate is the same
as that of rural independent banks.

The performance hypothesis was tested by identifying a set of ratios that have been found to be important indicators of bank performance in past research and testing the differences statistically by using discriminant analysis. If identified, these differences will be analyzed

in light of any behavioral differences found to exist between the two banking regimes. The discriminant analysis used to test this hypothesis is described below.

Discriminant analysis attempts "to describe using a linear model the relationship between a dependent and several independent variables . . . for the primary purpose of discrimination" (Kleinbaum and Kupper, p. 415). Specifically, two populations are selected for which there are measured values for n random variables, X_1, X_2, \dots, X_n . The problem is to form a linear combination of these variables:

$$L = a_1 X_1 + a_2 X_2 + \dots + a_n X_n$$

where the a_i are chosen to provide "maximum discriminating power between the two populations" (Kleinbaum and Kupper, p. 417).

Statistically, this means that the a_i are chosen to maximize the ratio of the sum of squares between group means to the sum of squares within group means.

Bromley describes two applications of discriminant analysis. First, the discriminant function can be used to classify a sample item whose group affiliation is unknown. By substituting the values of the function variables for this new unit into the discriminant function, the unit can be placed into one of the groups based on whether L is greater than or less than some critical value, L^* . For example, by calculating a discriminant function based on variables relevant to independent and affiliate bank operating behavior, a new bank could be

classified as independent or affiliate by considering the value of the function when the variable values for the new bank are substituted.

Second, "scaled coefficients" (p.320) can be calculated and then used to determine the relative importance of the variables in discriminating between the two groups. Continuing with the banking example, these scaled coefficients can be used to determine whether specific aspects of lending behavior, for example, are more important than capitalization levels in distinguishing between independent and affiliate banks. This second application of discriminant analysis is most important from the perspective of this study. By ranking the variables according to their importance in discriminating between independents and affiliates, it is possible to identify the potential impact on rural areas of differences in bank operating behavior. Those ratios that are affected most by local bank decision making and that relate directly to capital availability, e.g., the loan to deposit ratio, are of particular interest in this study. Other variables, e.g., equity capital to asset ratio, may have a more indirect impact on capital availability as they influence bank growth. Using discriminant analysis in this way can show whether the variables that are most important in discriminating between independents and affiliates are also variables that have direct implications for the availability of capital in rural areas of Virginia.

Discriminant analysis has been widely used as a method of analyzing socioeconomic data. It was selected for use in this study

since the primary interest is in identifying (1) whether differences exist in the behavior of affiliate banks relative to independents and (2) whether these behavioral differences result in identifiable performance differences. The lexicographic ordering analysis described earlier in this chapter provides a means for addressing the first concern. Discriminant analysis, by providing a ranking of those variables important to the discrimination process, is used to identify in what ways the operating performance of affiliate and independent banks differs. These two analyses together provide the necessary information to draw inferences about the impact of financial deregulation on nonmetropolitan economies in Virginia.

The variables selected for use in this discriminant analysis are described in Table III-1. These eleven variables are grouped into five categories: lending behavior, capitalization, profitability, behavior toward risk, and economic conditions. The variables included in each category are described below.

Lending Behavior. Five variables are included in this category to identify several major components of lending behavior relevant to rural capital availability. The ratios of loans to assets and loans to deposits are included to determine whether the proportion of assets and/or deposits made available to the community differs between affiliates and independents. The results of the aggregate analysis described above suggest that differences do exist.

To determine whether differences exist in lending to various sectors of the rural economy, three variables are included: loans to individuals/total loans, agricultural loans/total loans, and commercial and industrial loans/total loans. The relative importance of these variables in discriminating between independents and affiliates can help to identify differences in the allocation of capital among sectors in the rural economy.

Capitalization. The variable used in this category is equity capital/total assets. Again, the aggregate analysis described above showed a significant difference in the capitalization level of independents relative to affiliates. This discriminant analysis, however, determines the importance of capitalization relative to other variables used to discriminate between independent and affiliate banks.

Profitability. Two profitability measures are included in this category: net income/equity and net income/total assets. These are measures which have been used routinely in other banking studies (Dahl, Graham, and Rolnick). Profitability is included in this analysis to provide some measure of the relative stability of each type of bank in the local economy. If profitability is an important factor distinguishing between bank types, it could be a strong indicator of the ability of one banking type to survive vis-a-vis the other. For instance, if independent banks are less profitable to operate than affiliates, strong competitive forces may exist that could lead to a

Table III-1. Description of Independent Variables used in the Canonical and Step-Wise Discriminant Analyses of Federal Reserve Member Banks operating in Nonmetropolitan Virginia Counties in 1982

Variable	Description
Lending Behavior:	
L/D	Total loans/Total deposits
L/A	Total loans/Total assets
I/L	Loans to individuals/Total loans
A/L	Agricultural loans/Total loans
CI/L	Commercial and industrial loans/Total loans
Capitalization:	
EQ/A	Equity capital/Total assets
Profitability:	
NI/EQ	Net income/Equity capital
NI/A	Net income/Total assets
Behavior toward Risk:	
LL/L	Loan losses after recoveries/Total loans
Economic Conditions:	
POP	County population in 1980
PERCAP	County average per capita income in 1981

decline in independent banks. The reverse may also be true. Analyzing the importance of profitability as a factor distinguishing independents from affiliates may lead to the identification of possible changes in the competitive structure of rural banking markets in a post-deregulation environment.

Behavior toward Risk. One variable is used to describe the risk contained in the bank's portfolio: loan losses after recoveries/total loans. This ratio represents the risk of loan defaults. The higher the ratio, the higher the risk contained in the loan portfolio. This ratio could vary from one economic environment to another as the risk of loan prospects varies. Risk may be higher in an economy dominated by a highly cyclical industry, such as coal, as compared to a more stable, diversified economy. The importance of this ratio in the discriminant analysis provides evidence of the risk attitude of affiliate bankers vs. independent bankers, as reflected in their portfolio choices. Within a given economic environment, differences in this ratio across bankers should represent the risk contained in the portfolio and, consequently, the risk attitude of the banker. The ratio would be higher for a bank more tolerant of risk in the portfolio. There is some previous evidence that affiliate banks exhibit less risk averse behavior, which may result in more capital being made available to a rural area. The attitude toward risk may be an important indicator of capital availability in a post-deregulation banking market. Therefore, this variable can provide important insight into the impact of deregulation on rural capital availability.

Economic Conditions. Two variables are included to describe the economic condition of the county in which the banks operate--1980 population and 1981 average per capita income. These variables are included in the analysis to determine whether local economic conditions are important in distinguishing between bank types. For example, holding companies may be more likely to acquire banks in higher income counties and/or counties with a larger population base. As a result, affiliate banks may be associated with higher values for these economic variables.

The data for the discriminant analysis are from the fourth quarter 1982 Reports of Condition and Income compiled by the Federal Reserve Board. Values for the variables are calculated for all independent and affiliate banks operating in nonmetropolitan counties in Virginia. The total sample size is 123, with 28 banks classified as affiliates and 95 as independents. These variables are used in both the canonical and step-wise discriminant analyses and the results are discussed in Chapter V.

Summary and Research Applications

The two techniques described above are expected to provide information about the impact of financial deregulation on rural capital availability. Specifically, the lexicographic ordering technique is applied to independent and affiliate bankers operating in the case study

counties. This technique elicits goal orderings for the bankers that are then compared to determine any differences between the independent and affiliate responses. In addition, the interviews with bankers are used to identify market conditions in the case study counties, particularly as they relate to competition from nonbank financial institutions, and to identify the operating flexibility of independent bankers relative to affiliates. Together, these primary data are used to determine if basic differences in decision making behavior exist. It is hypothesized that differences do exist and this analysis determines what these behavioral differences are.

To corroborate the case study analysis, a discriminant analysis, using aggregate Virginia banking data, is conducted. This analysis results in a ranking of bank operating or performance variables according to their ability to discriminate between independent and affiliate banks. These results provide support for any behavioral differences identified through the individual case studies. Again, it is hypothesized that performance differences exist and this analysis attaches relative importance to performance variables in relation to their discriminating power.

Since this analysis is conducted using only Virginia nonmetropolitan counties and the banks operating within them, the results should not be considered representative of all bank behavior, in the absence of other supporting information. In addition, any case

study approach must recognize the limitations associated with using a relatively small number of observations. However, the choice of counties for case study was made by stratifying the population according to theoretical considerations and, therefore, bias associated with sample selection is reduced. Using a case study approach in combination with the aggregate discriminant analysis provides a means of generalizing the results achieved, if only to other counties in Virginia.

The perspective from which the study is conducted must be recognized. Information on capital availability is inferred from bank behavior and performance as identified by the bankers and their portfolios. In this sense, the study analyzes the supply side of a rural financial market, without consideration of the local demand for capital. The scope of this study was necessarily limited in order to focus on bank decision making behavior. However, the importance of extending any future analysis of rural financial markets to include a demand component is recognized.

The value of this research lies in its focus on the underlying differences in the behavioral structure of two types of banking institutions. As the relative distribution of independent and affiliate banks throughout rural financial markets changes with deregulation, these behavioral differences can potentially alter the capital structure in rural areas. This research begins to address this issue by focusing

in-depth on four nonmetropolitan financial markets. In addition, this analysis should identify other research issues pertinent to consideration of rural financial markets in a post-deregulation era.

Chapter IV

The Sample

In order to accurately identify the behavioral differences which may exist between independent and affiliate banks, it is necessary to hold certain factors constant and to identify other factors that could have a significant influence on bank behavior and performance. Therefore, the sample for the case studies was selected after a preliminary examination of aggregate banking data to determine whether market concentration and average bank size had significant value in explaining bank performance and should be held constant in the analysis. This preliminary analysis was designed to be descriptive and to provide the basis for potential stratification of the sample if the results suggest that stratification would strengthen the data and case study interpretation. This step was not designed to be a complete analysis of banking markets and its limited nature was recognized.

It is important to provide some context for the sample selection process. Therefore, the first section of this chapter provides a general description of the structure of banking in Virginia. From this basis, the preliminary aggregate analysis and the resulting sample selection process are discussed. Finally, the structure of the sample used in this study is described.

The Banking Structure in Virginia

At the turn of the century, the banking structure in Virginia was a unit banking system. However, throughout the period from 1936 to 1961, a debate continued in Virginia about the relative merits of a unit banking vs. branch banking system (Parcell). Proponents of branch banking cited five advantages of such a system:

1. Loan limits could be larger due to the larger size of branch banks.
2. Funds could be moved more readily to areas with greatest loan demand.
3. Greater diversification could be achieved by spreading bank funds across more economic areas, thus protecting against bank failure due to economic adversity in one region of the state.
4. Branch banks could enlist better quality management, raising banking standards.
5. Branch banks could offer more complete banking services to any community.

On the other hand, opponents of branching cited three disadvantages:

1. A threat of monopoly existed in moving to a branch banking system.
2. Failure of branch banks could have more widespread effects than the failure of an independent bank.
3. The impersonal attitude of a branch system stood in direct opposition to the local ownership and management of independent banks.

According to Parcell, this controversy is characteristic of a basic economic conflict between efficiency and the public interest. "Thus, the branch banking controversy revolves around a common issue of our American economic heritage. This is the continuing battle between efficiency and public welfare, where the large firm and its resulting efficiency is weighed against the concept of small, personalized enterprise and the fear of economic domination" (p. 67).

While the current debate about financial deregulation occurs primarily at the national level, the branch vs. unit banking debate has been restricted to state legislatures. In Virginia, this issue was resolved in 1962, with the passage of the Buck-Holland bill (Parcell). This bill allowed:

1. Banks to branch anywhere within the limits of the city or county in which the main office was located;
2. Banks to branch into contiguous cities or counties;

3. Banks to merge with or purchase banks operating anywhere within the state, i.e., branching via merger.

This bill set the stage for statewide expansion of banking in Virginia. For the first time, banks could branch de novo within their city or county and branch via merger anywhere in the state.

According to Parcell, the result was a decline in the number of banks in Virginia and an increase in the size and concentration of banking in the state. Two Federal laws facilitated this expansion. The Bank Holding Company Act of 1956 set up the conditions for an expanded role for holding companies in the state. However, the holding company movement in Virginia became important only in the late 1960's. The Bank Merger Act of 1960 made it easier for banks to merge by subjecting them to different standards than those set forth in the Clayton Anti-Trust Act.

These state and federal legislative activities caused dramatic changes in the Virginia banking system. According to Parcell, between 1962 and 1969, an average of fourteen bank mergers took place each year. During the same period, holding company acquisitions averaged six per year. From 1970-1973, however, an average of two mergers per year occurred, while an average of fourteen holding company acquisitions took place. The net result of these two movements was an increase in concentration in the Virginia banking system. In 1962, the

largest banking organization in the state controlled 10.2 percent of total deposits, while in 1973, the largest organization controlled 14.1 percent of total deposits. The market share of the largest four organizations increased from 30 percent in 1962 to 43 percent in 1973. The same market share figures for the largest eight organizations were 46.1 percent and 67.4 percent, respectively (Parcell, p. 82).

In 1982, Virginia's financial system contained a mix of institutions. While banks were clearly the most important institutions in the state with 141 state chartered banks, there were 40 savings and loan associations, 132 credit unions, and twelve industrial loan associations in operation. In addition, there were fourteen bank holding companies registered in the state--five of these were single bank holding companies. Since 1982, the second and fifth largest single bank holding companies have merged to produce one of the largest banking institutions in the state. Seventy percent of the state chartered banks in 1982 had less than \$50 million in assets. Twenty-seven percent had between \$50 and \$100 million, while about three percent had over \$100 million in assets (The Bureau of Financial Institutions, December 31, 1982). Based on these figures, Virginia's banking structure can be described as one of primarily small banks (under \$50 million in assets).

There are four possible institutional structures that a bank in Virginia might have. First, a bank can be organized as an independent

bank, operating in one city or county in Virginia and having no branch facilities. Second, a bank may be classified as a branch of an independent bank. These branches typically operate in the same locality as their parent bank. For the purposes of this study, these two types of organizations are classified as independent banks since, in both cases, decision making occurs at the local level.

A third type of organization is a bank that is operated as a branch of a large, single bank holding company. These branches are operated under the parent company's name and, typically, decisions are made at the home office (or a regional office) and applied to each branch in a similar manner. These institutions differ from the branch banks described above in that they tend to occur throughout the state and not necessarily in close proximity to their home office. Because decision making for these banks is centralized, however, they are classified as branches of independent banks which operate primarily out of metropolitan areas. Since the parent banks are located in metropolitan areas, these banks are not included in the nonmetropolitan sample used in this study. In addition, the information on branch banks is reported with the home office data, not separately. This problem is minor for branches of independent banks operating in the same area as the home office. However, bias could arise if the branches of single bank holding companies were included, since Virginia law permits branching by merger throughout the state. The exclusion of these banks is expected to minimize the bias in the results.

The fourth type of bank is a bank which is affiliated with a multi-bank holding company. These banks typically maintain their autonomy within the holding company structure and decision making is more decentralized under this structure than in a single bank holding company. These banks are classified as affiliate banks for the purposes of this study.

The structure of banking in Virginia falls in between the unit banking system of strictly independent banks found in some states and the unlimited branching system found in other states. Bank mergers in Virginia are controlled by the State Corporation Commission and are permitted once the Commission determines that the merger serves the public interest. According to the Virginia Code, mergers are "deemed in the public interest if . . . advantages such as, but not limited to, increased competition, additional convenience, or gains in efficiency outweigh possible adverse effects such as, but not limited to, diminished or unfair competition, undue concentration of resources, conflicts of interest, or unsafe or unsound practices" (The Bureau of Financial Institutions, 1980, p. 18). While the public interest is defined in economic terms, it is also evident that the legislature in Virginia maintains a commitment to the independent banking system that played an important role in Virginia's economic development in the past. The law states that "in applying the test of 'public interest' specified herein, the Commission shall follow the policy of favoring smaller institutions unaffiliated with a bank holding company and of not

encouraging undue concentration of resources" (The Bureau of Financial Institutions, 1980, p. 36).

The structure of banking in Virginia has changed in the past and has moved toward a larger, more highly concentrated system. Such changes may accelerate in the near future in a deregulated environment. However, there continues to be a commitment to independent banking that, while running counter to the current national tide of deregulation, is in keeping with the Jeffersonian heritage found in this state.

Results of Analysis of Aggregate Bank Data

Two separate issues were analyzed using aggregate bank data for Virginia counties classified as nonmetropolitan.⁶ First, the impact of bank market concentration and average bank asset size on selected bank operating ratios was analyzed to determine whether these particular factors should be held constant in the study. Second, the impact of bank organizational structure on selected bank operating ratios was considered to provide some justification for a more in-depth investigation of these two bank types via a case study analysis. This

⁶ Nonmetropolitan counties in Virginia are those counties which lie outside the Standard Metropolitan Statistical Areas (SMSA's) defined by the Bureau of the Budget. Virginia has 82 counties classified as nonmetropolitan (Rural Affairs Study Commission). Data were available from Federal Reserve files for 62 of these 82 counties. The other 20 counties either had no Federal Reserve member banks in 1982 or had only banks that were branches of the single bank holding companies operating in Virginia. In either case, bank data for these counties were unavailable through the Federal Reserve source used in the study.

analysis was conducted to determine the need for sample stratification for the case study analysis. The data were obtained from the "Reports of Income and Condition" filed with the Federal Reserve Board for the fourth quarter of 1982. Each issue is discussed separately below.

Concentration and Bank Size

The data were analyzed to determine what impact, if any, market concentration and average bank size had on selected bank operating ratios. The unit of observation was the county, which closely approximates the market area for most banks. Data were available for 62 nonmetropolitan counties in Virginia. The other counties either had no Federal Reserve member banks or had only banks that were branches of the single bank holding companies operating in Virginia. Two models were fit using Ordinary Least Squares regression. These models were:

$$(1) R_i = f(HI, SIZE)$$

$$(2) R_i = g(HI, SIZE, HI \times SIZE)$$

R_i = county average bank operating ratio, $i=1, 2, \dots, 10$

HI = Herfindahl Index, defined as the sum of squared market shares where market share is measured as the bank's share of total county assets

SIZE = average bank asset size in county market

HI x SIZE = interaction term

The Herfindahl Index is used to measure the degree of competition in each county (market). The index reflects both the number of banks in the market and their relative size. The lower bound on the index is $1/N$, where N is the number of banks in the market. An index value close to zero indicates pure competition, while the maximum index value of one corresponds to a monopoly. Higher index values are associated with less competitive banking markets, while lower values are associated with more competitive markets.

The dependent variables in each model were ten bank operating ratios. These ratios were selected to provide information on bank performance in four areas: liquidity, lending behavior, capitalization, and earnings from services rendered. To examine the liquidity situation, the ratio of cash and due to total assets was selected. Cash and due consists of cash in the bank's vault, as well as items in the process of collection from other banks. This ratio provides a measure of the cash on hand in the bank to meet current obligations. To the extent that bank size may be negatively correlated with risk averse behavior, one might expect this ratio to be smaller for larger banks.

The lending behavior of the banks was analyzed by considering six ratios: total loans/total assets; total loans/total deposits; real estate loans/total loans; agricultural loans/total loans; commercial and industrial loans/total loans; and loans to individuals/total loans. The first two ratios provide some measure of the extent to which a bank

places its capital within its local service or market area, typically the county. Total loans/total assets measures the extent to which the total assets of the bank are made available to the local community via loans. Total loans/total deposits provides a measure of the extent to which local capital deposited in the bank is returned to the local community via loans. The remaining four ratios describe the make up of the loan portfolio of the bank. In particular, the relative distribution of loans for real estate investment, farming, business, and household consumption is described. If a more concentrated banking market results in a decline in services to local customers, as suggested by the research of Heggstad and Mingo (1976) described above, one might expect loans with a lower rate of return or a higher delinquency rate to be reduced in the portfolio of banks located in a relatively concentrated banking market. In this case, commercial and industrial or consumer loans would tend to be emphasized over real estate or agricultural loans. Real estate loans, at least in the past, were long term, low interest loans. While interest rates are currently high, the loans are still long term, tying up bank capital. Agricultural loans are higher risk, due to the instability in agricultural markets caused by weather, world demand, etc.

The capitalization level of the bank was represented by the ratio of equity capital to total assets. This ratio was used by Kolb in his analysis of differences between independent and affiliate banks, because it reflects the different organizational structures of these banking

institutions. While this ratio is expected to be smaller for affiliate banks relative to independents as a result of different regulatory requirements, i.e., holding company banks are permitted to maintain lower ratios than independent banks, there is no a priori expectation about its relationship to market concentration or bank size.

Finally, bank earnings from services rendered are measured by fees/total income and income from loans/total income. Fees are the charges levied by the bank for checking accounts and other deposit services. Income from loans is composed of the interest and fees charged by the bank on its loans. If loan to asset or loan to deposit ratios are similar, these earnings ratios serve as proxies for price. They reflect the prices charged by the bank for two of its most important services. If the lending behavior in a bank market is similar to other markets, one might expect these ratios to be higher the more concentrated the bank market. Such an assumption is in line with the predictions of oligopoly theory and empirical research suggesting that higher levels of concentration are associated with higher prices.

While a priori expectations about the impact of market concentration or bank size are not available for all the ratios selected, it is possible to assign some relative importance to these sets of ratios based on the primary objective of this research. Since this research is focused on the impact of deregulation on local, rural financial markets, those ratios reflecting the local bank decision making process deserve

closest attention. The ratios measuring lending behavior and capitalization are particularly important, given that their levels are subject to a great degree of local bank control. Given the degree to which interest rates, even at the local level, are tied to those generated at the national level, i.e., rates on federal funds and treasury bills, the ratio of income from loans/total income becomes less useful for this study. Similarly, if bank markets are seen to be open and competitive, one would expect prices to be relatively uniform and, thus, the fees/total income ratio to provide limited information.

Finally, the liquidity measure is potentially useful as it provides a measure of risk averse behavior. However, this ratio might be higher for affiliate banks than predicted if affiliate banks exhibit less risk averse behavior than independent banks. Affiliate banks may carry balances classified as cash and due that are correspondent balances with the parent company. These balances are not held necessarily as a hedge against risk, but are the result of policy set by the parent company requiring these levels of correspondent balances. This potential bias reduces the value of this ratio as a liquidity measure and may partially explain any unexpected results. In summary, the results of the regressions using the lending behavior and capitalization ratios as dependent variables are considered to be more important than the results using other ratios as dependent variables in determining the basis for sample stratification.

The results from fitting the two models described above are presented in Table IV-1. The values of the dependent and independent variables were calculated for each nonmetropolitan county in Virginia. The dependent variables, or bank operating ratios, are county averages, found by taking the mean values of the ratios calculated for each bank operating within the county and filing with the Federal Reserve Board.⁷ The analysis, then, is focused on bank markets, as represented by the county unit, and not on individual banking institutions.

The results for the models show that only some bank operating ratios are influenced by either the concentration index or average bank size. The results in Table IV-1 are for only those regressions where one or more of the independent variables had significant value, i.e., $< .10$, in explaining the dependent variable analyzed. For model 1, the most significant explanatory variable is average bank asset size. It is a significant explanatory variable for five of ten operating ratios at a .10 or lower level. In addition, four of these ratios are ratios deemed to be of primary importance to this research. The Herfindahl Index is a significant explanatory factor only in the ratio of income from loans to total income. As was anticipated, market concentration and income from loans to total income are positively related, suggesting that interest and fees on loans comprise a higher percent of total bank income in a

⁷ Although all banks operating in Virginia are not members of the Federal Reserve, the majority are and any bias occurring in the data is expected to be small.

relatively concentrated banking market. However, as discussed above, this ratio is of limited importance to the current research.

These results show that average bank asset size is positively related to the loan to asset and loan to deposit ratios. Larger banks would appear to place a greater percent of their capital into local investments. Size is negatively related to capitalization and the percent of agricultural loans held in the bank's portfolio. The capitalization result may arise from a regulatory environment that permits holding company banks to maintain lower levels of capitalization. The underlying assumption in this explanation is that asset size and holding company affiliation are highly correlated in a positive direction. Agricultural loans, on the other hand, may be concentrated in smaller banks serving more remote agricultural areas. While there was limited a priori evidence about the direction of these relations, the outcome of these regressions is not in conflict with expectations about the influence of size on performance, and the importance of asset size in explaining bank performance is well supported.

Model 2 provides some additional information about the concentration variable. An interaction term was included in this model to determine how the interaction of these two independent variables affected their explanatory power in relation to the dependent variable. From a theoretical standpoint, it is likely that increasing market concentration would be associated with increasing size of firm in a given

Table IV-1. Results of Regression Analysis of Operating Ratios for Virginia Federal Reserve Member Banks operating in Nonmetropolitan Counties in 1982 considering Concentration and Bank Size Issues

Dependent Variable	Significant Independent Variable(s)	Sign of Coefficient	Significance Level
(N=62) Model 1			
Income from loans/Total income	HI	+	5.0%
	SIZE	-	.1%
Total loans/Total assets	SIZE	+	2.0%
Total loans/Total deposits	SIZE	+	2.0%
Equity capital/Total assets	SIZE	-	.6%
Agricultural loans/Total loans	SIZE	-	6.0%
(N=62) Model 2			
Fees/Total income	HI	+	4.0%
	HI x SIZE	-	7.0%
Cash and due/Total assets	HI	+	.7%
	SIZE	+	.1%
	HI x SIZE	-	.3%
Loans to Individuals/Total loans	HI	+	1.0%
	SIZE	+	1.0%
	HI x SIZE	-	.4%

market. If that occurs, the interaction term can help to describe the effect that increasing one independent variable may have on the explanatory power associated with another independent variable. In three of the bank operating ratios analyzed, this interaction term has a significant negative value. This value can be interpreted to mean that there is some interaction between the two independent variables in relation to their influence on the dependent variable. The negative value indicates that an increase in one of the independent variables will decrease the effect of the other variable on the dependent variable. For these three ratios, an increase in either bank size or market concentration will tend to reduce the impact of the other variable on the bank operating ratio being analyzed.

The results of this analysis suggest that in considering the issues of market concentration and asset size in relation to bank performance, the most important factor affecting performance is asset size. Market concentration has significant explanatory value for only one ratio in Model 1 and this ratio represents an aspect of pricing behavior deemed to be less important for the present analysis. Size has significant explanatory value in five ratios, four of which have a direct bearing on this research. In Model 2, market concentration is important in explaining fees/total income, also reflecting pricing behavior, and is important, along with asset size, in explaining two variables of primary interest in this study, cash and due/total assets and loans to individuals/total loans. However, in neither case is concentration the

most significant explanatory variable. Thus, these regression results suggest a sampling scheme for use in determining the impact of financial deregulation on nonmetropolitan capital markets which controls for bank size while effectively ignoring the issue of concentration. Little bias is expected to occur as a result of permitting concentration levels to vary.

Bank Organizational Structure

The same aggregate banking data were used to provide some preliminary information about the relationship between the organizational structure of the bank and bank performance. Data for 123 banks were used in this analysis. The following model was fit using Ordinary Least Squares regression:

$$(1) R_i = h(D)$$

R_i = bank operating ratio, $i = 1, 2, \dots, 10$

D = dummy variable representing bank organizational structure, i.e., $D=1$ if bank is independent and $D=0$ if bank is affiliated with a multi-bank holding company.

The results of these regressions are presented in Table IV-2. Again, the results are presented only for those regressions with a significant dummy variable. Organizational structure has significant explanatory value for four ratios. For three of these ratios, fees/total income, cash and due/total assets, and loans to individuals/total loans, the values for independent banks are lower than the values for affiliate banks at a nine percent or lower level of significance. There was no a

priori expectation of the direction of difference for fees/total income or loans to individuals/total loans. However, it was anticipated that cash and due/total assets would be higher for independents, seeking to protect themselves by maintaining greater liquidity. However, as was noted above, cash and due may be higher for affiliates as a result of their relationship with the parent company. Balances maintained with the parent company may be reflected in cash and due and, therefore, this ratio may not accurately measure the risk aversion of affiliates vis-a-vis their independent counterparts.

Equity capital/total assets was significantly greater for independent banks, as predicted by Kolb's results. Again, this ratio reflects the institutional and regulatory constraints placed on an affiliate as a result of the relationship to the parent company. Affiliates are able to maintain less capital at the local level than are independents, as reflected in this ratio.

These results suggest that bank organizational structure does have an impact on at least some specific aspects of bank operating performance. Based on the results of this preliminary aggregate analysis, as well as the results achieved by other researchers, a more in-depth analysis of the differences in decision making between affiliate and independent banks is undertaken in this study.

Table IV-2. Results of Regression Analysis of Operating Ratios for Virginia Federal Reserve Member Banks operating in Nonmetropolitan Counties in 1982 considering Bank Organizational Structure Issue

Dependent Variable	Significant Independent Variable(s)	Sign of Coefficient	Significance Level
(N=123)			
Fees/Total Income	D	-	3.0%
Cash and Due/Total Assets	D	-	9.0%
Equity Capital/Total Assets	D	+	.4%
Loans to Individuals/Total Loans	D	-	9.0%

Suggested Sampling Scheme

The primary objective of this study is to determine the impact of financial deregulation on rural capital markets. Therefore, the sampling scheme is designed to emphasize those factors expected to be different in a deregulated financial environment and to enable investigation of the local bank decision making process in rural areas. It remains to describe those factors which should be held constant in selecting the sample.

The analysis of aggregate Virginia bank data suggests that market concentration is not an important factor influencing selected nonprice aspects of bank performance. Therefore, the sample is not stratified according to market concentration levels, and little bias is expected to occur. However, average bank size does have important explanatory value when considering these same aspects of bank performance. It is necessary to control for the effect of asset size by comparing bank performance within a given size class. The sample for this study is stratified by size class and counties within each size class are selected for case studies.

In terms of deregulatory impact, there appear to be performance differences between banks depending upon their organizational structure, i.e., independent vs. affiliate. Therefore, the sample is stratified by organizational structure to identify any significant differences in decision making between these two bank types.

The analysis described above suggests a sample that is stratified in two ways. First, Virginia banks operating in nonmetropolitan counties are classified as to their organizational status, i.e., independent or affiliate. Second, within each organizational class, banks are grouped according to size, measured by dollar value of total assets. For the purposes of this research, another factor should be considered. Since the focus is on bank decision making and consequent performance at the local level, external factors which might influence this decision making process should be held constant. Specifically, decision making and performance of independent banks relative to their affiliate counterparts should be analyzed under similar economic conditions, i.e., independent banks operating in one county with a particular economic structure should not be compared with affiliate banks operating in another county with a different economic structure. Several performance measures, such as loan losses after recoveries to total loans, loans to deposits, and agricultural loans to total loans, may vary as economic conditions vary. Without controlling for economic structure, it would be impossible to isolate behavioral differences in these ratios from those due to varying economic conditions. Therefore, the sample is constructed so that the performance of independent and affiliate banks of similar size is analyzed within a common economic situation. Such a sample is obtained by choosing counties in which both independents and affiliates operate. Again, the aggregate analysis described above suggests that the market concentration of these counties can be ignored.

The Sample

As discussed above, the study population from which the sample is drawn must be stratified so that bank asset size is held constant throughout the analysis. To accomplish this stratification, the banks in the population were placed first into five size classes: assets of less than \$10 million, \$10-25 million, \$25-50 million, \$50-100 million, and greater than \$100 million. The size distribution of banks in the study population was compared to the size distribution of banks in the Fifth Federal Reserve District, including Virginia (McCarthy and Walker) and the results are shown in Table IV-3. For the purposes of this analysis, the size classification was reduced to only four classes: small (less than \$25 million assets), medium (\$25-50 million assets), large (\$50-100 million assets), and very large (greater than \$100 million assets).⁸ Several steps were followed in selecting a sample from the overall population.

First, the behavior of independent and affiliate banks must be analyzed within a particular banking market in order to provide the depth of analysis required in a case study and to ensure that the

⁸ The size categories used in this analysis were selected by running a multiple regression including three dummy variables for the small, large, and very large categories. The categories described above yielded at least one significant dummy coefficient for seven of the ten bank operating ratios analyzed. Based on these regression results, grouping banks into these four size classes appears to provide an appropriate stratification to control for the influence of bank asset size on bank performance.

Table IV-3. Percentage Distribution of Virginia Federal Reserve Member Banks operating in Nonmetropolitan Counties as compared to All Banks in the Fifth Federal Reserve District

Assets(\$ Millions)	Study Population	Fifth District
Less than \$10	8.9%	9.7%
\$10-25	28.4	25.4
\$25-50	33.3	29.4
\$50-100	25.2	18.8
Greater than \$100	4.1	16.7

Class(\$ Millions)	Study Population	Fifth District
Small(Less than \$25	37.3%	35.1%
Medium(\$25-50)	33.3	29.4
Large(\$50-100)	25.2	18.8
Very Large(Greater than \$100)	4.1	16.7

economic structure in which the banks operate is the same. Since the bank market is closely approximated by the county, the unit of observation for each case study is the individual county.

Second, since the focus of this research is the comparison of independent and affiliate bank decision making and performance, only those counties containing both independent and affiliate banks are suitable for a case study. In addition, to control for bank size, these independents and affiliates must fall into the same size classification.

To accomplish these steps, the banks in the population were arrayed according to size classification. Those counties that had at least one independent and one affiliate bank in the same size class were selected. In the small size classification, only one county had both types of bank. In the medium size classification, there were three counties. In the large size classification, there were two counties. In the very large size grouping, there were no counties meeting the selection criteria.

In the large size group, one county was eliminated because it was used as the site for pre-testing parts of the survey instrument. A determination was made that one county from each of the small, medium, and large size classifications would be selected for a case study. It was necessary to select one of the three counties in the medium size class. One county contained a reasonably large independent city within its borders. The presence of this city makes it possible to gain some

insight into the impact of a metropolitan center on bank behavior in the surrounding county.

The three counties selected for analysis have similar economic structures. Agriculture plays an important role in the economy of these counties and they have small commercial and industrial sectors. In order to provide greater economic diversity for the case studies, counties in the coal region of Virginia were selected for analysis. It was necessary to choose two different counties in the coal region in order to get participation from two banks of similar size. Given the similarities in the economic structures of the coal counties, no bias is expected to occur.

Each banker selected for the case study was contacted to determine his willingness to participate in the study. Bankers in the counties representing the small and large size categories agreed to participate. Full participation of the bankers in the county originally selected in the medium size category was not achieved, so the remaining county in that category was substituted. The bankers in this county agreed to participate.

In summary, five counties were selected for case studies to determine differences in the decision making process of independent vs. affiliate banks. The total number of banks to be surveyed in the five counties is eight--four independent banks and four affiliate banks.

Two of the banks included in this sample had merged with one of Virginia's large single bank holding companies within the past year. They were kept in the sample and their status, i.e., independent or affiliate, in 1982 was used to classify them. Additional questions were included in these two interviews to evaluate the transition period resulting from merger. In particular, the changes in bank decision making authority as a result of the merger were identified.

Summary

The banking structure in Virginia has changed over time from a unit banking system to one permitting branching via merger throughout the state. This structure provides an appropriate setting for considering the behavioral and performance differences between independent and affiliate banks.

A major component of this analysis consists of case studies of banks in nonmetropolitan areas of Virginia. The sample for these case studies was selected following an analysis of aggregate Virginia banking data. The results of the aggregate analysis suggested that (1) bank asset size should be held constant and (2) market concentration could be disregarded. In addition, it was deemed important to analyze bank behavior under common economic circumstances, so banks operating within the same county were paired.

The sample selected through this process consists of five counties-- one containing a pair of small banks, one containing a pair of medium banks, and three containing two pairs of large banks. Two of these large bank counties were drawn from the coal region and were included in the sample to provide a greater degree of economic diversity to the case studies.

Chapter V

Results

This chapter describes the results of the case study and aggregate analyses. The first section describes the lexicographic orderings and the constrained maximization problems formulated for each banker surveyed. The conclusions regarding utility vs. profit maximization and any differences between affiliate and independent bankers are discussed. The second section describes the results of the discriminant analysis and evaluates these results in relation to those from the lexicographic ordering analysis. The third section describes the qualitative information obtained from the bank surveys. Specifically, differences in bank support of the local government sector and in bank operating flexibility are described. In addition, this section summarizes bankers' attitudes and comments regarding financial deregulation. Finally, the fourth section summarizes the results of each separate analysis and describes an overall picture of the impact of financial deregulation on nonmetropolitan capital markets, based on the results of this study.

Lexicographic Ordering and Constrained Maximization

Each of the eight bankers in the sample completed a lexicographic ordering of the operating goals important to his overall bank decision making. (See Question 1, Appendix A.) Five goals were ranked by each banker:

1. Earn a reasonable return on assets.
2. Stimulate community growth.
3. Insure safety of depositors' money.
4. Maintain a satisfactory market share of deposits.
5. Place a satisfactory proportion of loans within service area.

The first, third, and fourth goals were included to represent several important aspects of business behavior--profitability, risk attitude, and market share. The second and fifth goals were included to determine the importance bankers attached to stimulating local economic growth. These goals were discussed with several bankers prior to inclusion in the survey to determine whether they represented the major goals considered by bankers in decision making. Finally, each banker interviewed was asked to amend the list of goals before ranking them to ensure that all goals important to each individual's decision making process were considered. Table V-1 presents these bank operating goals and records the number of times each goal was ranked as the first through fifth most important goal. (Appendix B presents the actual goal ordering for each banker and the goal ordering used in the constrained maximization problem, grouped by county.)

Table V-1. Bank Operating Goals and the Frequency of Ranking by Eight Sample Bankers in Selected Nonmetropolitan Counties in Virginia

Goal	#1	#2	#3	#4	#5
Return on assets	6	2	-	-	-
Maintain satisfactory market share	-	2	2	3	1
Stimulate community growth	1	1	4	2	1
Insure safety of depositors' money	1	3	1	-	3
Maintain satisfactory loan to deposit ratio	-	-	1	3	4

In order to translate each banker's goal ordering into a constrained maximization problem, a satisfactory level of achievement for each goal was identified. (See Questions 2-7, Appendix A.) Only three of the five operating goals were expressed in quantitative terms suitable for a linear programming model--return on assets, market share, and satisfactory loan to deposit ratio. The other two goals--stimulate community growth and insure safety of depositors' money--were expressed in qualitative terms and could not be incorporated into the constrained maximization problem.

In general, the interviews indicated that the ways in which the bankers act to stimulate community growth can be described as passive activities. Banks are well represented in most important civic groups and government boards (e.g., the Rotary Club, local planning and/or industrial development boards, the school board, Chamber of Commerce.) Bank officials make themselves visible in the community and publicize the bank's services to the public and private sectors of the community. However, the bankers indicated that they rarely solicit business or actively engage in efforts to attract industry or other businesses to the local area.

In terms of insuring the safety of depositors' money, the bankers stated that they follow a "conservative" banking policy. This policy was stated in very general terms by the bankers (e.g., limit lending for high risk ventures, keep loan delinquency rates low, diversify the

portfolio.) These "conservative" policies, along with those designed to stimulate community growth, were quite broadly defined and, for that reason, were not incorporated into the linear programming models.

Although the original orderings of the five operating goals for each pair of bankers are not identical, these goal orderings do translate into similar constrained maximization problems. It would appear that the independent and affiliate bankers in each pair do not have significantly different orderings of operating goals. This observation is in line with the conclusion about differences in bank performance described below.

As demonstrated in the pretest of the lexicographic ordering technique, it was also necessary to elicit, from each banker, the important constraints faced in making decisions about the bank's operation. Five types of constraints were used in the models:

1. Desired allocation of total loans among specific types in the portfolio--real estate, commercial and industrial, agricultural, and consumer/installment loans;
2. Maximum value for the loan to deposit ratio;
3. Percent of total deposits allocated to cash, municipal bonds, and/or U.S. treasuries;
4. Total 1982 real estate loans must be greater than or equal to 95 percent of 1981 total real estate loans;

5. Total cash must be greater than or equal to reserves. The first three constraints were identified by the bankers. The fourth constraint was added to the maximization problem to represent the fact that real estate loans made by the banks in past years remain on the books currently. In spite of the bankers' interest in reducing the proportion of low interest, fixed-rate real estate loans in the portfolio, several holding company banks are trying to reduce their real estate loans by five percent each year, with limited success. Therefore, the constraint was formulated so that a maximum of five percent of real estate loans could either be sold off or retired in any given year. The fifth constraint was added to account for the reserve requirements placed on banks by the Federal Reserve. Exact reserve calculations could not be made with the available data. However, data on the actual reserves held by the bank were available and were used to impose a lower bound on the cash held by the bank. The introduction of these last two constraints should help the predicted portfolio to approximate more closely the bank's actual 1982 portfolio. (See Questions 16-17, Appendix A.)

The interest rates used in the linear programming models are current, i.e., 1982 rates. The rates on real estate, agricultural, and short-term commercial and industrial loans are annualized rates published by the Federal Reserve Board. The interest rate on installment loans was obtained during the bank interviews, since this rate shows the greatest variability from bank to bank. (See Question

15, Appendix A.) Current interest rates are used in the analysis since the bankers base loan decisions on the prevailing rate, rather than what has happened in the past. This is true since short-term loans are a significant component of the bankers' portfolios. (Appendix C presents the final formulation of the constrained maximization problem, for each banker, that resulted in an optimal portfolio solution.)

Tables V-2 through V-5 present the actual 1982 portfolio values for each banker and the predicted portfolio values from the optimal solution of the constrained maximization problem. The tables are organized by county, so that the results can be compared for similar sized banks. In addition, the actual and predicted values for several important bank operating ratios are presented. Before comparing the actual portfolios for each pair of bankers, several observations are made about the accuracy of this modeling technique.

Results indicating the Accuracy of Lexicographic Ordering Technique

The models resulted in predicted portfolios that had reasonable diversification among asset categories for all bankers except Banker 3 (Table V-2) and Banker 6 (Table V-4). The actual and predicted values for variables in the portfolio are quite different, however. This result is due to the fact that the level of deposits for all bankers except Banker 3 was set exogenously according to the market share figure given by each banker during the interview. This enabled the model to be defined as a single period model. In all cases, this market

share figure was lower than the actual market share captured by the bank in 1982. The deposit level selected in the model, in turn, served as the basis for determining the level of total loans, as well as levels for individual loan classes. For this reason, the magnitudes of the actual and predicted values are never the same. Therefore, in comparing actual values with those determined by the linear programming models, it is necessary to look at operating ratios which give the relative values of selected variables, predicted and actual.

In considering the predicted bank operating ratios, it is important to note that the models were designed to consider the supply side of the banking market, as viewed by each banker. There was no explicit consideration of the demand side in these models. Failure to consider demand factors results in loan to deposit ratios that are set at their upper bound in the optimal solution for five of the eight bankers interviewed. While this loan to deposit ratio may be optimal from the banker's perspective, it is not realistic given the sluggish loan demand seen in each of these nonmetropolitan areas. To a lesser extent, the loan to asset ratios are similarly affected. Another variable influenced by the lack of a demand component is the before tax return on assets. In all eight cases, the predicted value is greater than or equal to the actual value. In the model, loanable funds can be placed in the loan category yielding the highest return without consideration of the demand for that loan type. Again, such behavior may be optimal from the banker's standpoint, but is not necessarily consistent with economic realities.

Table V-2. Actual and Predicted Portfolio and Operating Ratio Values for Bankers 1 and 2 in Nonmetropolitan County A, representing Large Banks (greater than \$50 million in assets)

Variable	(\$1,000's)			
	Banker 1		Banker 2	
	Actual	Predicted	Actual	Predicted
Cash and due	8,677	2,344	2,418	376
U.S. treasuries	2,522	5,023	14,614	0
Municipals	4,769	11,502	10,317	29,606
Loans	26,606	40,187	43,612	49,815
Real estate loans	12,469	8,037	24,918	29,889
Agricultural loans	1,009	10,047	2,443	0
Commercial/industrial loans	4,457	0	6,352	9,963
Consumer loans	8,710	20,093	10,922	9,963
Deposits	53,951	50,233	73,528	58,605
Loans/Deposits	.49	.80	.59	.85
Loans/Assets	.45	.68	.55	.62
Before tax Return on Assets	.08	.12	.11	.13
Agricultural loans/Total Loans	.04	.25	.06	.00
Real estate loans/Total Loans	.47	.20	.57	.60
Commercial/industrial loans/Total loans	.17	.00	.14	.20
Consumer loans/Total loans	.33	.50	.25	.20
Market share	.32	.30	.44	.35

Other differences between predicted and actual values are the result of individual model specifications rather than underlying structural problems with the lexicographic ordering technique, such as those described above. The predicted values for Banker 2 (Table V-2) and Banker 8 (Table V-5) are quite close to the actual values. Several prediction problems, however, are common to the other six models. First, the percent of loans placed in agriculture is underestimated for four of six banks, with no agricultural loans being made. This bias may result from the fact that agricultural loans typically comprise less than fifteen percent of total loans for these banks. In addition, three of the six bankers located in agricultural areas recognized the importance of nonbank sources of agricultural finance, particularly federal lending agencies. It is possible that these other sources of agricultural capital influence the emphasis placed on the agricultural sector by the bankers. Since alternatives to bank loans exist for farmers, the bankers may give this sector only secondary consideration, while emphasizing consumer or commercial loans. Except for other local banks, no other sources of competition for commercial loans were identified by the bankers and, in the area of consumer finance, only credit cards and savings and loans were frequently cited as sources of competition. This explanation for the lack of emphasis on the agricultural sector by the bankers surveyed (none of the bankers identified a specific constraint on agricultural loans) is merely

Table V-3. Actual and Predicted Portfolio and Operating Ratio Values for Bankers 3 and 4 in Nonmetropolitan County B, representing Small Banks (less than \$25 million in assets)

Variable	(\$1,000's)			
	Banker 3		Banker 4	
	Actual	Predicted	Actual	Predicted
Cash and due	1,104	633	594	229
U.S. treasuries	507	0	200	0
Municipals	2,031	0	3,455	7,652
Loans	8,434	15,785	10,953	13,998
Real estate loans	2,984	7,892	5,493	5,599
Agricultural loans	1,273	0	846	0
Commercial/industrial loans	1,142	0	0	5,599
Consumer loans	2,480	4,736	4,987	2,800
Deposits	14,992	24,285	19,316	16,468
Loans/Deposits	.56	.65	.57	.85
Loans/Assets	.51	.96	.50	.64
Before tax Return on Assets	.08	.11	.09	.12
Real estate loans/Total loans	.35	.50	.50	.40
Agricultural loans/Total loans	.15	.00	.08	.00
Commercial/industrial loans/Total loans	.14	.00	.00	.40
Consumer loans/Total loans	.29	.20	.46	.20
Market share	.44	.71	.56	.48

suggested by the case study interviews and can be substantiated only through a more detailed study of the agricultural lending practices of nonmetropolitan banks.

Second, the percent of loans in real estate was underestimated for four of six banks. This underestimation is likely the result of the bankers' desire to reduce their total loan commitment in real estate, but their inability to do so. Several bankers pointed to problems in selling their mortgages in the secondary market, either as a result of the small size of their mortgage holdings or the failure of housing, particularly in the coal fields, to meet the criteria set by federal mortgage programs. In addition to the two systematic errors described above, four of the six bankers underestimated their market share of total county deposits. However, there is no obvious explanation for such a systematic underestimation.

Finally, there are differences between predicted and actual values that occur, but not in a systematic way. The models are based on the subjective evaluation by each banker of the important constraints faced by the bank. Therefore, not all bankers identified the same constraints and there are differences in how precisely each constraint was described by the banker. For this reason, there is some inconsistency in the accuracy with which any model predicts actual behavior.

Table V-4. Actual and Predicted Portfolio and Operating Ratio Values for Bankers 5 and 6 in Nonmetropolitan County C, representing Medium Banks (between \$25 and 50 million in assets)

Variable	(\$1,000's)		Banker 6	
	Banker 5 Actual	Predicted	Actual	Predicted
Cash and due	11,014	9,732	1,775	648
U.S. treasuries	0	0	1,912	0
Municipals	1,194	0	6,804	16,034
Loans	16,253	19,886	22,161	24,048
Real estate loans	9,826	7,954	12,275	18,036
Agricultural loans	976	0	536	0
Commercial/industrial loans	2,334	5,966	2,250	0
Consumer loans	3,848	5,966	5,975	0
Deposits	26,674	38,929	35,324	30,059
Loans/Deposits	.61	.51	.63	.80
Loans/Assets	.55	.67	.54	.59
Before tax Return on Assets	.09	.09	.10	.11
Real estate loans/Total loans	.60	.40	.55	.75
Agricultural loans/Total loans	.06	.00	.02	.00
Commercial/industrial loans/Total loans	.14	.30	.10	.00
Consumer loans/Total loans	.24	.30	.27	.00
Market share	.18	.15	.24	.20

Given these general observations, the following conclusions can be drawn regarding the appropriateness of the lexicographic ordering technique as a model of bank decision making behavior. First, an optimal solution was obtained for the original formulation of the linear programming model in seven of the eight cases examined. For the remaining case, an optimal solution was obtained by dropping the third most important goal. In all cases, however, the bankers can be described as optimizing a preference structure consisting of a hierarchy of goals (numbering two or three), the most important of which is the maximization of profit. These results, in conjunction with those of the pretest described in Chapter I, suggest that bankers consider multiple goals in their decision making process and that a multi-attribute preference structure, elicited through the lexicographic ordering technique, provides a better approximation to the banker's utility function than does a single attribute function.

To test the conclusion that bankers maximize multiple goals, not just profit, linear programming models were formulated for each banker with profit maximization (return on assets) in the objective function. The results corroborate the conclusion reached above. For two bankers (Bankers 2 and 5), no optimal solution was obtained for the profit maximization model. For two bankers (Bankers 3 and 7), the lexicographic ordering model did a better job of predicting the actual portfolio than did the profit maximization model. In both cases, loans to deposits and agricultural loans to total loans were overestimated

Table V-5. Actual and Predicted Portfolio and Operating Ratio Values for Bankers 7 and 8 in the Coal Region Counties, representing Large Banks (greater than \$50 million in assets)

Variable	(\$1,000's)			
	Banker 7 Actual	Banker 7 Predicted	Banker 8 Actual	Banker 8 Predicted
Cash and due	2,610	1,450	41,830	0
U.S. treasuries	7,005	17,803	0	0
Municipals	11,052	10,682	15,976	65,994
Loans	15,752	26,618	121,215	128,379
Real estate loans	10,271	14,640	37,563	44,933
Agricultural loans	56	0	276	0
Commercial/industrial loans	836	5,324	44,835	44,933
Consumer loans	5,283	6,655	43,290	38,514
Deposits	47,472	89,015	174,200	160,474
Loans/Deposits	.33	.30	.70	.80
Loans/Assets	.28	.47	.62	.66
Before tax Return on Assets	.08	.12	.10	.13
Real estate loans/Total loans	.65	.55	.31	.35
Agricultural loans/Total loans	.00	.00	.00	.00
Commercial/industrial loans/Total loans	.05	.20	.37	.35
Consumer loans/Total loans	.34	.25	.36	.30
Market share	.21	.40	.61	.56

using the profit maximization model, while real estate loans to total loans was underestimated. For the remaining four bankers (Bankers 1, 4, 6, and 8), the portfolios predicted by the profit maximization model were similar to those from the lexicographic ordering model. Therefore, in these four cases it was concluded that the the profit maximization model performed as well as the lexicographic ordering model, but no better. (See Appendix D for the predicted portfolios resulting from the profit maximization model.)

Comparison of Independent and Affiliate Banks

While it is important to discuss the adequacy of the technique used in this study as a model of bank decision making behavior, the next step in this analysis is to compare the predicted portfolios for independent and affiliate banks in each county. The next four sections discuss these results.

County A. Table V-2 shows the results for the two large banks operating in County A. The major differences⁹ identified from a comparison of the portfolios for independent Banker 1 and affiliate Banker 2 are that the independent banker has a:

1. lower loan to deposit ratio;

⁹ Since there is only a single observation for each bank, a comparison cannot be made in strict statistical terms. However, in order to describe differences between the two types of banks, a major difference is said to occur when ratio values differ by five percentage points or more.

2. higher consumer loan to total loan ratio;
3. lower real estate loan to total loan ratio;
4. a higher percentage of loans allocated to agriculture than to the commercial/industrial sector.

With the exception of agricultural and commercial/industrial loans, these differences are evident when actual portfolio values are compared. The problem with the allocation of agricultural and commercial/industrial loans arises because these two classes of loans were grouped together by the banker as lines of credit. Because the interest rate on agricultural loans is higher than that for commercial/industrial loans, all loans placed in this credit line category go into the agricultural sector. However, this is not an accurate representation of bank policy.

The actual and predicted behavioral differences between the two types of banks in this pair are the same. Both bankers are utility maximizers; yet the results of this maximization, i.e., the predicted portfolios, are different. However, the magnitude of difference decreases when actual values rather than predicted values are analyzed. For example, the predicted portfolio shows that 50 percent of the independent bank's loans are in consumer or installment loans, compared with 20 percent for the affiliate bank. The actual figures are much closer, 33 and 25 percent, respectively. Similarly, the predicted ratio of real estate loans to total loans for the affiliate bank is .60, compared

to .20 for the independent. Again, the actual difference is much smaller, .57 and .47, respectively.

A possible explanation of these differences may lie in the importance of local competition to bank decision making. The predicted model is based on the bankers' subjective evaluation of their decision making process. It is not unreasonable to expect that differences between individuals will exist, particularly given that they operate within distinct institutional contexts. However, when actual portfolio choices are made, local demand factors and consideration of local competitive forces must come into play. The comparison of model results for this pair of bankers provides the first indication that behavioral differences may exist between independent and affiliate bankers; yet these behavioral differences may translate into only minor performance differences between bank types. Consideration of the results for the remaining three pairs should help clarify this observation.

County B. Table V-3 shows the results for the small banks in County B. Comparing the predicted portfolio of independent Banker 3 with that of affiliate Banker 4, the independent banker has a:

1. lower loan to deposit ratio;
2. higher real estate loan to total loan ratio;
3. lower commercial/industrial loan to total loan ratio.

When actual portfolio values are considered, however, the affiliate banker has the higher real estate loan ratio and the lower commercial/industrial loan ratio. There is no major difference between their loan to deposit ratios.

For this pair of bankers, predicted and actual behavioral differences are not the same. This inconsistency may result from the fact that, for each banker, the predicted model has some important failings. For Banker 3, the constraints identified were quite broad and did not result in portfolio diversification. The banker did not identify a constraint on the percent of total loans placed in agricultural and commercial/industrial loans. There were no constraints identified for the allocation of municipal bonds and U.S. treasuries in the portfolio. In addition, the maximization of market share, i.e., total deposits, resulted in a market share of 71 percent, almost 30 percentage points higher than the actual market share. For Banker 4, the model results appear to reflect the difference between the banker's subjective evaluation of decision making and the economic realities imposed on the bank's decision making process. The underestimation of both the percent of loans in real estate and in installments appears to reflect the bank's desired loan allocation, rather than the allocation resulting from a supply-demand equilibrium. The overestimation of the percent of loans in the commercial/industrial category, again, seems to reflect the bank's desire to emphasize this sector. This might suggest how the bank would respond to new or increased demand in this sector.

Based on this comparison, it is difficult to draw firm conclusions about the differences between these two banks. Both bankers appear to maximize utility and there are some differences in the predicted portfolios of the two bankers. However, these same differences do not appear when actual portfolio values are compared. The results for this pair appear to be contradictory and, therefore, less robust than for the pair in County A.

County C. Table V-4 shows the results for the medium banks in County C. Comparing the predicted portfolio of affiliate Banker 5 to that of independent Banker 6, the independent banker has a:

1. higher loan to deposit ratio;
2. higher real estate loan to total loan ratio;
3. lower commercial/industrial loan to total loan ratio;
4. lower consumer loan to total loan ratio.

Looking at actual portfolio values, however, shows that the independent banker has a lower real estate loan ratio and a higher consumer loan ratio. For this pair of bankers, as with the County B pair, the predicted and actual differences are not consistent. Again, the predicted portfolios have important failings. The lack of diversification in Banker 6's portfolio results from the broad constraints imposed. The loan policy in this bank established maximum values for the percent of

loans in real estate (75 percent), commercial/industrial (40 percent), and consumer loans (40 percent). These constraints had to be imposed as less than or equal to constraints and no lower bounds were set. As a result, all loans were placed into real estate, where the constraint requiring that 1982 real estate loans be greater than or equal to 95 percent of the 1981 level constituted a lower bound.

For Banker 5, the predicted portfolio appears to represent an ideal situation, similar to that described above for Banker 4. It is difficult, therefore, to predict the important differences between these two bank types. At the same time, however, the actual differences in portfolio values are small, similar to the banks in County A. The fact that only minor differences exist supports the conclusion reached above--even if differences between bank types are predicted, actual performance differences tend to be minor, possibly as a result of the competitive and demand conditions in the local economy.

Coal Counties. Table V-5 shows the results for the large banks in the coal region. Comparing the predicted portfolio of independent Banker 7 to that of affiliate Banker 8, the independent banker has a:

1. lower loan to deposit ratio;
2. higher real estate loan to total loan ratio;
3. lower commercial/industrial loan to total loan ratio;
4. lower consumer loan to total loan ratio.

These differences are consistent with those identified by comparing the actual portfolios. In addition, large differences are found in both the predicted and actual portfolios. For example, the independent bank's predicted loan to deposit ratio is .30, compared to .80 for the affiliate. The actual values are .33 and .70, respectively. The predicted percent of loans in real estate for the independent bank is 55 percent, compared with 35 percent for the affiliate. Actual values are 65 percent and 31 percent, respectively. Finally, the predicted percent of loans in the commercial/industrial category for the independent bank is 20 percent, compared with 35 percent for the affiliate. Actual values are five percent and 37 percent, respectively.

These results suggest that predicted behavioral differences exist between the independent and the affiliate bank and that these differences translate into actual performance differences. This result appears to contradict the conclusion suggested above that behavioral differences, evident in at least one bank pair, are not reflected in sizeable performance differences. It is possible that these conflicting conclusions arise from differences in the economic structures of the counties in which the banks operate, i.e., diversified agricultural economy (County A) and coal based economy. The next section summarizes the results described above and discusses the possible conclusions that this analysis suggests.

Summary of Lexicographic Ordering Analysis

Consistent differences are identified in the portfolios of independent and affiliate banks for two of the four pairs analyzed. Differences are described as consistent when a comparison of the predicted portfolios and a comparison of the actual portfolios yield similar results. For the pair in County A, however, the differences between bank types identified by comparing actual portfolios are much smaller than those identified by comparing predicted portfolios, leading to the conclusion that actual performance differences between bank types are minor. Considering the pair in the coal counties, however, the differences found through the comparison of predicted portfolios for the independent and affiliate bank and those found through the comparison of actual portfolios are consistently large, leading to the conclusion that actual performance differences between bank types do exist. The inconsistency in the results for the other two pairs does not help to clarify these two opposing conclusions. Although bank asset size was considered to be an important factor influencing bank behavior, size is not responsible for the differences found in this analysis. Both pairs of banks were drawn from the same size class, i.e., banks with more than \$50 million in assets. However, a possible explanation of these differences, based on information gathered in the bank interviews, is offered below.

A better understanding of the nature of the local economies in these two areas may provide insight into the different results for these two bank pairs. County A is a reasonably diversified nonmetropolitan county, less than 50 miles from a major regional metropolitan banking center. While agriculture, i.e., tobacco and dairy, is an important part of the local economy, there is also a small commercial and industrial sector. Competition in the local banking sector is strong among several banks, a local credit union, and the financial service institutions in the nearby urban center. Both the diversified nature of the local economy and the relatively intense competition in the financial market create a situation where bank performance would tend to be uniform across bank types. Local competition tends to force uniformity in bank prices and services, in order for a bank to survive. All bankers interviewed noted a decline in customer loyalty and an increase in the rate consciousness of consumers. Banks can no longer rely on their past record or their name in attracting customers.

At the same time, it appears that in a diversified economy, there is little advantage to being an affiliate bank rather than an independent bank. This observation can be explained by considering the situation in the coal counties. The economy in both sample counties is dominated by the coal industry. The cycle of these local economies is tied directly to the coal cycle. As a result, bankers, in general, are forced into a conservative stance in order to ensure their bank's stability. A more conservative policy, such as that followed by the independent

banker interviewed, requires that bank funds not be concentrated in coal related activities and that loan to deposit ratios be maintained at relatively low levels. Deposits come mainly from the coal industry and if the bank maintains a high loan to deposit ratio, i.e., 80 percent, a decline in coal business may leave the bank with fewer deposits to cover their loans outstanding. A conservative bank policy, i.e., relatively low loan to deposit ratio, stems directly from the lack of economic diversity in this region.

However, an affiliate banker, in this same region, may be able to follow a less conservative policy because of the protection afforded by the holding company structure. For example, if an affiliate banker maintained a .80 loan to deposit ratio and there was a decline in coal business, the banker could readily sell loans to sister banks within the holding company. Since holding company affiliates operate in a larger region or statewide, it is unlikely that all areas will face excess loan demand at the same time. The affiliate banker is in a better position vis-a-vis the independent banker to adopt a less conservative policy, given the safeguards that result from institutional affiliation with a holding company. These same safeguards, however, would be less important in a more diversified economy where bank deposits come from a variety of sources and are not linked to the vagaries of a single industry. These observations are substantiated by the results described above.

The discussion above is offered as a possible explanation of the conflicting conclusions that result from an evaluation of the lexicographic ordering analysis. This analysis was designed to test the behavioral hypothesis:

Rural affiliate banks have the same operating goals as their independent bank counterparts.

The results, however limited, do not lead to the rejection of this hypothesis and suggest that:

1. Independent and affiliate bankers operating in the nonmetropolitan counties analyzed behave similarly and can be described as maximizing a multi-attribute utility or preference structure, where profit maximization is one goal or attribute in the banker's preference structure.
2. In a more diversified nonmetropolitan county, predicted differences between the independent and affiliate bankers do not translate into major differences in actual bank performance.
3. In the less diversified coal counties, predicted differences do translate into differences in actual bank performance.

Based on these results, the behavioral hypothesis was not rejected. The differences identified between bank types are not consistent enough to suggest that affiliates and independents are different types of institutions, in any circumstances. If these results are representative of statewide banking behavior and performance, the discriminant analysis of aggregate banking data should find that few variables are significant in discriminating between bank types. The economy of Virginia is diversified and the results of such an aggregate analysis should be in line with those for County A, rather than the coal region. The next section describes this discriminant analysis.

Discriminant Analysis of Aggregate Virginia Banking Data

Two separate discriminant analysis procedures were used to analyze the differences between bank organizational types, i.e., independent banks vs. affiliate banks. First, a canonical discriminant analysis was run to obtain standardized coefficients for the quantitative variables. Second, a step-wise discriminant analysis was run to determine the subset of variables that produce a good discrimination model. The classification variable in each case was bank type, represented by a one for independent banks and a zero for affiliate banks. The quantitative or independent variables in the analysis are those described in Table III-1. The results of each analysis are described below.

Canonical Discriminant Analysis

The canonical discriminant analysis forms a linear combination of the independent variables that summarizes the variation between classes. In this application, a linear combination of selected bank operating ratios and economic variables is formed that best describes or summarizes the difference between independent and affiliate banks. The coefficients of the independent variables in the linear combination are called canonical coefficients and are typically presented as standardized or normalized coefficients, i.e., the pooled within-group variance equals one.

A canonical discriminant analysis was run using the eleven variables shown in Table III-1. However, there was very high correlation between two pairs of variables that affected the analysis. The loan to deposit and loan to asset ratios had a correlation coefficient of .95. The net income to assets and net income to equity capital ratios had a correlation coefficient of .89. One variable from each pair was deleted from the analysis to ensure that correlation among the variables did not affect the standardized coefficients and, thus, the ranking of the independent variables in terms of discriminating power.

The model was run, eliminating the loan to asset and net income to equity capital ratios. The results of the model using nine independent variables are summarized in Table V-6. The most important variable in distinguishing between bank types is the equity

capital to total assets ratio. This result is in line with that achieved by Kolb in his analysis of behavioral differences between independent and affiliate banks. As described in Chapter III, this ratio reflects a specific capital allocation policy of the holding company, as well as the differing regulations placed on holding company banks relative to independent banks.

In addition to the equity capital to total assets ratio, several other variables appear to have some discriminating power. Looking at Table V-6, there are four variables with approximately equal standardized coefficients--commercial and industrial loans to total loans, net income to total assets, per capita income, and agricultural loans to total loans. However, their coefficients are only half as large as that of equity capital to total assets. The large coefficient value for the first ratio in Table V-6 relative to all other coefficient values suggests that this ratio serves to separate independent banks from affiliate banks. This conclusion is substantiated by the results of the step-wise analysis discussed below. In addition, except for agricultural lending policy, the interviews suggested no differences in bank behavior in relation to the other variables that have some importance in the discrimination process, i.e., profitability and commercial/industrial lending policy.

Table V-6. Ranking of Standardized Coefficients for Independent Variables used in Canonical Discriminant Analysis of Bank Organizational Types: Independent and Affiliate Banks operating in Nonmetropolitan Virginia Counties and Members of the Federal Reserve, 1982

Variable	(N=123)	Standardized Coefficient
Equity capital/Total assets		.7760
Commercial/industrial loans/Total loans		.3959
Net income/Total assets		.3727
County 1981 per capita income		-.3682
Agricultural loans/Total loans		.3551
Consumer loans/Total loans		-.2759
Loan losses after recoveries/Total loans		.1863
Total loans/Total deposits		.1486
County 1980 population		-.1265

F statistic = 3.7426

Prob > F = .0002

Step-Wise Discriminant Analysis

The step-wise discriminant analysis procedure selects the subset of independent variables that forms a good model for discriminating between groups. The model selected by this technique is not necessarily the best model, since all possible models are not evaluated during the step-wise selection process. However, this procedure does choose, from among those models evaluated, the model with the largest R^2 value. In this case, the analysis was run using the nine independent variables discussed above. At each step in the analysis, the variable that contributed the most to the model's discriminating power was entered. Table V-7 shows the results of the step-wise discriminant analysis.

As in the canonical discriminant analysis, the ratio of equity capital to total assets is the most significant and can be described as having the greatest power in discriminating between bank types. However, in this analysis, the ratio of agricultural loans to total loans is of significance, even though it has an F statistic only half as large as that for the equity capital to total assets ratio. The remaining two ratios that entered the model are not significant at the .05 level or lower and appear to be of less importance in the discrimination process.

Table V-7. Results of Step-Wise Discriminant Analysis of Bank Organizational Type: Independent and Affiliate Banks operating in Nonmetropolitan Virginia Counties and Members of the Federal Reserve, 1982

(N=123)			
Variable	Step Entered	F Statistic	Prob > F
<hr/>			
Equity capital/Total			
Assets	1	13.621	.0003
Agricultural loans/Total			
loans	2	6.065	.0147
Consumer loans/Total			
loans	3	3.015	.0841
Net income/Total Assets	4	2.994	.0852
<hr/>			

Conclusions from Discriminant Analysis

The discriminant analysis procedures were used to test the performance hypothesis:

The performance of rural affiliate banks is the same as that of rural independent banks.

The results of both the canonical and step-wise discriminant analyses suggest that there are no striking performance differences between independents and affiliates. The equity capital to total assets ratio, in both cases, provides the maximum power in discriminating between bank types. The difference in this ratio between bank types results from institutional or regulatory constraints placed on the banks, rather than from differences in bank behavior at the local level. However, the differences may be important from the standpoint of local economic growth, as discussed later in this chapter. Based on these results, the performance null hypothesis was not rejected. This conclusion follows from the failure to reject the behavioral hypothesis. Therefore, the results of the case study and aggregate analyses appear to be consistent.

It is possible that bank performance, as it relates to agriculture, may differ as a result of the bank's institutional structure. The ratio of agricultural loans to total loans was the second most important discriminating variable in the step-wise analysis, but ranked fifth in

the canonical analysis. While these results tend to be contradictory, there is some evidence from the bank interviews that agricultural lending policies may differ from independents to affiliates. One banker observed that while his primarily agricultural bank had been acquired by a major single bank holding company, the holding company had no agricultural lending policy at the time and was not aware of any special circumstances related to agricultural lending. Such circumstances, as described by several bankers, dictate that agricultural loans be short-term, rather than installment loans. It is not possible for a farmer to repay a loan in monthly installments, when farmers typically borrow to finance spring planting and have the cash to repay the loan following the harvest in the fall. Holding companies, in at least two cases, pressured their affiliate bankers to make installment loans to farmers.

These observations suggest a lack of understanding of agricultural finance needs on the part of holding company policymakers. This lack of understanding may result from the fact that holding companies, both single and multi-bank, set many policy guidelines for their affiliate or branch banks from their metropolitan headquarters, and there is less room for local input. This centralized decision making, in turn, may result in differences in the way that independent and affiliate banks can serve the local community. For the agricultural sector, these results suggest the need for future analysis. Several other observations relating to such qualitative differences in bank behavior are discussed later in this chapter. There is no evidence

from the bank interviews to suggest that commercial/industrial lending policies are different between bank types. Profitability was similar among banks, with all but one bank indicating a 1.00 to 1.25 percent return on assets as an acceptable level. These interview results support the conclusion from the discriminant analysis that, with the exception of agricultural lending and equity capital, there are no striking performance differences between bank types.

Comparison of Aggregate Analysis and Case Study Results

In general, the results of the discriminant analysis and the lexicographic ordering analysis are consistent. Few major performance differences between bank types are evident from the discriminant analysis. These results corroborate the results from the case studies. However, those results also suggest that differences in bank behavior may depend on the particular local economy in which the banks operate. A less diversified, one industry economy, peculiar to certain regions in the state, may provide the environment in which behavioral differences are translated into performance differences, as observed in the coal region case study. An aggregate analysis of state banking data cannot be expected to pick up regional differences in banking behavior. This result supports the application of a regional approach through case studies similar to that used in this research.

In summary, the bankers surveyed in the case studies appear to maximize multiple goals, rather than strictly profit. While predicted

differences between bank types are identified for two bank pairs, in only one case are these predicted differences supported by actual performance differences. An explanation for this one case was sought by considering the economic structure of the local area, particularly as it relates to economic diversity. The more limited case study results are corroborated by the aggregate discriminant analysis, where the most significant discriminating variable was the equity capital to total assets ratio. With the exception of agricultural loans to total loans, major performance differences are not identified.

Qualitative Results

The results of the case study analysis, in conjunction with the discriminant analysis, show few differences in affiliate and independent bank behavior. However, the case study interviews obtained data on qualitative aspects of bank behavior. Differences between bank types in several areas are evident. A descriptive discussion of the interview data is presented in the following sections.

Bank Support of the Local Government Sector

There are no obvious differences in the support given to the local government sector by independents and affiliates. Neither type of banker indicated that preference is given to local rather than nonlocal bond issues. (See Question 8, Appendix A.) For most banks, the bond rating is a more important factor in decision making than the

location of the issuing government. Most banks carry a mix of revenue and general obligations bonds, although general obligation bonds are more important, particularly for independent banks. (See Question 9, Appendix A.) Finally, all bankers indicated a willingness to provide assistance to local governments in issuing bonds, although some banks had not been approached to do so. Types of assistance range from purchasing local bonds and/or facilitating the transfer of funds from a granting agency to the local government to providing financial expertise in putting together a bond issue. (See Question 10, Appendix A.)

These types of assistance can be classified as passive vs. active. Passive assistance requires the bank to function in a traditional way, either by investing money in municipal bonds or facilitating deposit activities. Active assistance takes the bank out of its traditional role and places it in the role of financial consultant to the local government. According to several bankers, this active support role is more appropriate for a holding company bank than for an independent bank. Affiliate banks can draw on the resources of the holding company's municipal bond department, while the independent bank must rely on limited and nonspecialized staff to perform the same support role. The access to specialists and a broader range of resources, human and financial, was frequently cited as a major advantage of the holding company system. Affiliate banks can serve as an important resource for local governments if they choose to take an active role in supporting the local government in its attempts to raise capital through

bond issues. It appears that the institutional structure of the holding company is able to better facilitate the adoption of such an active role, compared to an independent banking structure.

Bank Operating Flexibility

Interview questions were designed to elicit information that would permit a test of the corollary behavioral hypothesis:

Rural affiliate banks have the same operating flexibility as their independent counterparts.

The discussion to follow provides evidence that leads to the rejection of this null hypothesis.

The interview responses point to important differences in the flexibility that independent and affiliate bankers have in decision making. (See Questions 11-13, Appendix A.) Only one of the affiliate bankers interviewed has ultimate authority in lending decisions and in setting interest rates. All other affiliates follow loan or interest rate policy guidelines determined at the holding company headquarters and applied to each bank. The strictest control is exercised by large, single bank holding companies, where the banks in the system are operated as branches reaching out from the metropolitan headquarters. Affiliates of multi-bank holding companies maintain some autonomy, but are still subject to overall guidelines. Some bankers indicated that monthly statements are issued from the holding company detailing the

types of loans, i.e., consumer, real estate, etc., that are to be emphasized that month.

All the independent bankers, on the other hand, follow loan policies designed by them and approved by the local board of directors. Ultimate authority resides at the local level, leaving them in a better position to adjust policy based on even subtle changes in local circumstances. Several affiliate bankers felt that independents can be more competitive because of this flexibility. In some cases, the interest rates and services charges set by the holding company are not in line with those prevailing in the local market. Independents could apparently take advantage of such differences to gain a competitive edge over their affiliate counterparts. However, the survey was not designed to determine whether independents actually use this flexibility and in what ways they do so.

The independent banks have control over investment decisions which, in many cases, the affiliate banks relinquish to an investment group at the holding company level. If an independent bank is in the market for municipal bonds and a local bond issue has a competitive rating, a decision can be made at the local level to purchase a local bond issue. However, most affiliate banks, faced with the same bond issue, would have to go through holding company headquarters to get authority to purchase the local bond. Such authority would be granted if the holding company was in the market for municipal bonds. This,

in turn, depends on the overall tax structure of the holding company rather than the situation in the local affiliate bank. These constraints on a local affiliate bank's decision making may impede their ability to play an active role in local government finance. It is unclear, without further analysis, what the net effect of these two aspects of affiliate bank behavior will be.

At the root of these differences in operating flexibility is a difference in the decision making locus for each bank. For the independent bank, decisions clearly are made at the local level, based on a consensus of opinion between bank management and the local board. For holding company banks, however, decision making is not a strictly local phenomenon. Branch banks of the large single bank holding companies, based on observations from the two transition bankers interviewed, are removed from the basic decision making process that occurs at the holding company level. Both bankers that had recently merged into a large single bank holding company indicated that policies are developed by the holding company and are administered by the local banks. The banker that had been part of the new system for over a year indicated that he has less authority in making lending decisions and setting rates than before the merger. The banker that had merged only three months prior to the interview has seen fewer changes, but feels that these changes will follow a reasonable "honeymoon" period.

The highly centralized decision making that appears to be characteristic of large single bank holding companies is less evident in a multi-bank system. A certain degree of autonomy is maintained at the affiliate bank level. However, overall guidelines are set by the holding company and, according to the bankers interviewed, are followed closely by the affiliates. It is possible that a recent change in the structure of one dominant multi-bank holding company foreshadows a new trend in Virginia banking. This company is moving toward a more centralized banking system by consolidating many small affiliate banks into larger banking regions, operating under a single bank name. This move may represent a trend toward the more centralized structure common to large single bank holding companies in Virginia.

Views on Deregulation

In general, views on deregulation were mixed, with three bankers favorably impressed, three bankers unfavorably impressed, and one banker undecided. (See Question 26, Appendix A.) Surprisingly, two independents and one affiliate were classified as favorable, while one independent and two affiliates were classified as unfavorable. However, these overall opinions tend to result from the fact that the independent bankers took a micro view, while the affiliates took a macro view of deregulation. The two independents who viewed deregulation in a positive light focused on their freedom to enter new markets and compete with nonbanks. The two affiliates who viewed deregulation

negatively focused on the enhanced instability in the overall financial system as a result of reduced restrictions on banking activities. The diversity of opinions expressed by the case study bankers is in line with the multiplicity of views on deregulation expressed in the press over the past two years. There are several dominant themes that most bankers referred to in the interviews. These themes are highlighted below. (See Question 25, Appendix A.)

All bankers agreed that bank mergers will be increasingly common in the banking industry as the holding company system expands. However, the bankers also felt that independents will survive, but that these banks will have to be managed better than they have been in the past. The result of increased merger activity, according to these bankers, will be a banking system in Virginia dominated by five or six large banks and a more centralized monetary system in the nation as a whole. Another factor contributing to a more centralized monetary system will be interstate banking, which these bankers predicted is less than five years away.

Another important observation by these bankers was that deregulation is resulting in decreased profitability for banks as they face a much higher cost of funds in a deregulated environment. Those observers who see deregulation as a move toward a more efficient financial services industry would argue that decreased profitability is necessary to reduce the number of relatively inefficient banking

institutions that proliferated as a result of post-Depression regulations. Some of the bankers interviewed concur with this view, stating that deregulation will force bankers to be better managers and to pay more attention to asset-liability management than they have in the past. Again, these observations support the view that deregulation leads to a more efficient financial system.

Another perspective on deregulation expressed by several of the bankers interviewed is that deregulation threatens the stability of our financial system. Their comments were in line with the argument that past banking regulations were designed to protect the public welfare and that any sacrifice in technical efficiency, due to limitations on bank size, was a necessary tradeoff. Deregulation restores the industry to a pre-Depression situation where bankers are able to engage in numerous nonbanking activities and where the size of individual institutions can be increased via mergers. Opponents of deregulation argue that banks are moving into areas where they lack expertise and that failures are very likely. This argument characterizes one aspect of the public interest evaluation of deregulation. Deregulation may lead to a more technically efficient financial industry, but if this efficiency is gained at the expense of stability, the public interest may not be served by this process. In addition, as described in Chapter I, regulation resulted in a wide distribution of banks throughout the country. If deregulation leads to a concentration of banking resources, some small rural areas may no longer be served by a local bank, either independent or part of a holding company system.

Several bankers felt that deregulation is the result of pressure from large, urban banks who face the greatest competitive pressure from nonbanks. Smaller banks operating in nonmetropolitan areas are forced to follow their lead, even though they do not face similar threats from nonbanks. For the bankers in this sample, other local banks are a more important source of competition than either local or national nonbank financial institutions. (See Questions 20-24, Appendix A.) Only in the coal region did bankers point to national competition as an important competitive factor, particularly large brokerage houses such as Merrill Lynch and large money center banks operating in areas where the coal companies' headquarters are located. The importance of national competition appears to be directly related to the large money interests associated with the coal industry.

Another source of pressure for deregulation hypothesized by several bankers comes from the regulatory agencies themselves. Several bankers suggested that a more centralized financial system, with few independent banks, would enable the money supply to be more tightly controlled. Other bankers questioned whether independent banks would be allowed to survive in the future, or whether they would be legislated out of existence. While these are untested assumptions on the part of the bankers, they may not be unreasonable given the volatile history of monetary control in this country. Again, this view suggests that the overriding impetus for deregulation is increased

technical efficiency of the financial services industry, viewed in a macroeconomic sense. Possible tradeoffs between efficiency and the public interest are considered in the final chapter.

All of the bankers interviewed pointed to advantages and disadvantages of the holding company system, as well as the independent banking system. The primary advantage of the holding system is directly related to its relatively large size. This size advantage means that the holding company can offer more complete banking services and have a more specialized staff. In addition, an affiliate bank can draw on the resources of this large institution, both financial and human, to meet the community's credit needs. The affiliates are able to get better information through their holding company than independents are able to obtain while operating alone. The holding company's size, however, is also viewed as its major disadvantage. With increased size comes increased bureaucracy and more distance from the local people who use the bank's services. Several affiliate bankers commented that people are frustrated by the strict rules that must be followed and the lack of authority at the local level.

Size is also an important issue for independent banks. Their relatively small size allows them to offer more personalized service, such as rapid loan processing and specialized deposit services. Their local ownership and management enables them to be more in touch with the

credit needs of the local community. In addition, their greater flexibility and latitude in decision making enables them to tailor their services to local needs and to meet those needs more quickly, such as providing short-term loans for less than \$1,000. However, the range of services independent banks can offer is limited by their small size. Without the specialists available in a holding company, independent banks must either contract for specialized services, such as investment counseling or municipal bond service, at great expense, or risk losing customers to banks that can offer these services.

Most bankers interviewed agree, however, that there may be a role for both types of banks in the future. One independent banker viewed his role in a new, deregulated industry as that of a retail bank, meeting consumer loan and mortgage demand in the local area. While such a role is more limited than that assumed by these banks in the past, such specialization may be the key to survival for independent banks in the future.

Overview of the Impact of Deregulation on Capital Availability
in Nonmetropolitan Areas

To determine the impact of deregulation on capital availability, this study began by assuming that deregulation will set up conditions that result in more affiliate banks and less independent banks. The impact of deregulation, therefore, may be detected in any critical differences in the way independent and affiliate banks operate in a

given nonmetropolitan area. The results of several separate analyses previously described are combined to suggest an overall pattern of impact of deregulation on selected nonmetropolitan counties in Virginia.

The results of the lexicographic ordering analysis suggest that bankers are multi-attribute utility maximizers. However, for all bankers surveyed, maximization of profit was the most important goal in their goal hierarchy. This suggests that there are no clear differences between independent and affiliate bankers in that one type does not consistently maximize profit while the other maximizes utility. In addition, it appears that utility maximization is not inconsistent with earning a satisfactory profit since the top goal for the bankers was to earn a reasonable return on assets.

While utility maximization is important analytically, it is more important to identify whether utility maximization by each type of bank results in differences in bank operation. In general, predicted differences in behavior occur in only two of four cases and only in one case are these predicted differences consistent with observed performance differences. These results, in combination with those from the discriminant analysis, suggest that there are few important differences in the behavior of affiliate banks relative to independent banks. Thus, the behavioral null hypothesis was not rejected. The one exception of the coal region case does suggest that the level of diversification in the local economy may have an important bearing on

whether these two types of banks behave the same. The possible influence of local economic conditions suggests the importance of a regional approach to analyzing financial markets.

The one variable that is most important in discriminating between independents and affiliates is the equity capital to total assets ratio. As described above, the higher ratio for independent banks relative to affiliates is not the result of differences in bank decision making, but results from constraints placed on independent banks by regulatory agencies and on affiliates by their holding companies. However, this difference may have implications for the local community. The fact that independents must maintain a higher equity capital to total assets ratio may inhibit their ability to grow. One independent banker noted that his bank had experienced such a large increase in assets from 1982 to 1983 that he was forced to sell more stock, i.e., raise more equity capital, to maintain the required equity capital to total assets ratio.

Increasing the equity capital of an independent bank, however, is not necessarily a simple task. These banks tend to be locally owned and their stock is not often publicly traded. To increase equity, the banker must either go to local owners and ask them to increase their stake in the bank or seek out new, typically local, stockholders. In small nonmetropolitan areas, the pool of potential stockholders is most likely small and raising the additional equity capital necessary for continued bank expansion may prove to be difficult, if not impossible.

Holding company banks do not face such constraints on growth. They can maintain a lower equity capital to total assets ratio and, when faced with asset growth and the need to raise additional equity capital, they can usually rely on the major stock brokerage houses and exchanges for assistance.

The difference in the equity capital to total assets ratio between bank types appears to constrain the independent bank and its ability to serve the community. This constraint is probably of little importance in nonmetropolitan areas experiencing limited economic growth. However, in areas experiencing both population and economic growth, such a constraint limits the ability of an independent bank to change and grow as its community does. Affiliate banks have a distinct advantage in terms of keeping up with growth in the local area. Again, it is important to recognize that this difference in the bank's ability to meet local capital needs does not arise from differences in the behavior of the individual banks. Rather, it results from the regulatory or institutional environment in which the banks operate. These regulations do not necessarily reflect the increased ability of one bank type to better serve the local community. Indeed, it is possible that these regulations serve to promote the expansion of a bank type, i.e., affiliate, that is inherently less flexible and, therefore, more restricted in its ability to meet credit needs in a nonmetropolitan area.

While the quantitative aspects of this study lead to the conclusion that independent and affiliate bankers operate in the same way, all bankers surveyed agreed that independent and affiliate banks are distinct types of banking institutions. Differences between bank types become more apparent when qualitative aspects of bank behavior are analyzed. Two particular areas merit attention. First, affiliate banks could potentially play an active role in local government bond financing by utilizing the full range of resources available at the holding company level. Independent banks are more limited in terms of the human and financial resources that can be used to serve the local government. In this area, a difference in the role that independents and affiliates can potentially assume is evident. Whether an actual difference occurs depends on the willingness of the affiliate bank to serve the local government and the interest on the part of local government in utilizing such services.

The difference between bank types described above is directly related to the size advantage held by holding company banks. A second difference results from the decision making locus of each bank type. Independent banks have greater operating flexibility because policies are made and altered at the local level. For holding company affiliates, the decision making locus is removed from the local level, typically, to a major metropolitan center. It is much more difficult for policies made in a metropolitan center to reflect unique local, rural conditions. In addition, it is more difficult to alter those policies in

response to local phenomena, e.g., local business cycles, emergencies and disasters, etc.

In addition to having an impact on operating flexibility, removing decision making from the local area to a metropolitan center means that decisions and policies are more likely to be based on statewide and national aggregate economic conditions and not unique local circumstances. A holding company's policies are designed to be applied to banks operating throughout the state and, as indicated by several bankers surveyed, these policy guidelines are not always appropriate for a particular local area. For nonmetropolitan areas, such policies are less likely to be appropriate since economic conditions in nonmetropolitan counties are likely to deviate from statewide average conditions. Again, in three of the four areas studied, bankers indicated that recessionary times were still upon them, despite overall economic improvement in Virginia and the nation.

In contrast to the holding company banks, independent banks make decisions for a single local market and are able to consider unique local circumstances in this process. As a result, their policies can be tailored to meet local needs and to reflect local economic conditions. This difference between independent and affiliate banks has important potential implications for capital availability. The independent bank can be more responsive to local needs, potentially, and may be able to perform in a way that stabilizes local economic fluctuations, e.g., by

lowering interest rates to borrowers during a recession or by extending payment periods for borrowers during an industrial slowdown. In order for an affiliate banker to perform in this way, the banker first must make the holding company policymakers aware of the unique local conditions and then must petition to change holding company policies. Such institutional constraints on the affiliate banker reduce the latitude with which the banker can operate. At the same time, these constraints also inhibit the ability of an affiliate to optimally serve the local community.

To summarize, the qualitative results from the bank interviews suggest that there are some behavioral differences between independent and affiliate banks that relate to their differing institutional structures. First, the greater human and financial resources of the holding company indicate a potential for affiliate banks to play a more active role in at least one area, local government bond finance. Second, independent banks maintain their decision making locus at the local level, allowing them to design policies to meet specific local needs and to alter those policies in response to changes in local economic conditions. This is in sharp contrast to the less flexible holding company system where decision making is centralized in major metropolitan areas.

There appear to be different conclusions based on the quantitative analysis as compared to those suggested by the qualitative interview data: differences in the range of services available from each

bank type and in operating flexibility. A possible explanation may lie in the competitive nature of local banking markets. It is likely that competition among banks in the nonmetropolitan areas analyzed is strong enough to constrain bank performance. These banks are responding to the same set of local demand and competitive conditions and, in most of the cases analyzed, neither bank has a competitive edge in terms of market share. Only one bank interviewed could be described as dominant in the local market, in the sense of being the lead bank and having a large share of market deposits.

It is also possible that differences in bank behavior may become obvious in a less competitive market. If the structure of banking in Virginia continues to become more highly concentrated, with several holding companies controlling the state's banking industry, it is possible that affiliate bank behavior may deviate from independent bank behavior. In this new structure, holding companies would be in a better position to act as oligopolists, agreeing to limit competition in certain regions, as the state's banking market is divided among the holding companies. Oligopoly theory would suggest that such a reduction in competition in local banking markets may result in important performance differences between affiliates and those independent banks that survive. The results of this analysis suggest the importance of considering changes in the competitive structure of local banking markets in a post-deregulation era.

The results of this study have greatest value when used to suggest (1) possible policy implications of deregulation, particularly in relation to nonmetropolitan banking markets and (2) research applications suggested by the techniques used in this study. The final chapter presents the conclusions reached in this study and addresses the policy and research issues raised by this analysis.

Chapter VI

Conclusions, Policy Implications, and Research Applications

This final chapter summarizes the conclusions reached after considering the results of the case study and aggregate analyses. In addition, several policy implications suggested by this research are discussed. Finally, some applications of this research are described. A number of relevant issues are raised that merit future study.

Conclusions

Since banking deregulation may be expected to result in an increase in the number and importance of affiliate banks relative to independent banks, the potential impact of deregulation on capital availability in nonmetropolitan counties in Virginia was the object of this study. The objective was to determine whether differences exist in the behavior and performance of these two types of banks. The results of the case study analysis of bank behavior based on the lexicographic ordering technique suggest that both types of bankers have multiple goals, rather than a strict profit maximization goal. The predicted portfolios that resulted from the utility maximization process were not consistently different across bank types. Therefore, the behavioral hypothesis that the operating goal structures of rural independent and affiliate bankers are the same was not rejected.

This analysis did suggest, however, that the economic structure of a particular local area may have an impact on the behavior and performance of these two types of banks. The evidence from the coal county case studies suggests that differences may exist between banks in a less diversified, more risky economy like the coal region. The interview data suggest that holding company banks may be able to behave less conservatively in such an environment as a result of the protection afforded them by their affiliation with a holding company operating in many regions of the state. This difference may have important implications for capital availability in such areas of the state.

The conclusion regarding the lack of behavioral differences between bank types was corroborated by the results of the discriminant analysis, which showed no striking performance differences. The most significant discriminating variable was the ratio of equity capital to total assets. The difference in this ratio between bank types does not result from differences in bank decision making, but rather from differences in the regulatory constraints applied to each type of bank. The ratio of agricultural loans to total loans was also an important explanatory variable in one of the discriminant analysis procedures applied. The interview data also suggested that bank performance in relation to the agricultural sector may be different for each bank type. However, there was no supporting evidence of differences in performance for any other ratios used in the discriminant analysis. Therefore, these results do not lead to the rejection of the null hypothesis that the performance of rural independent and affiliate banks are the same.

Other evidence analyzed in this study suggested that some important differences exist between independents and affiliates that are not identified by an analysis of performance ratios. The bank interviews showed that decision making, to a great extent, is removed from the local level for affiliates. In contrast, policies for independent banks are set at the local level, and they are more free to adopt policies appropriate to local needs. The more centralized decision making structure common to holding companies serves to constrain the decision making flexibility of affiliates and, according to some bankers interviewed, often leads to the development of policies not entirely appropriate to particular local circumstances. Based on these conclusions the corollary behavioral hypothesis that rural independent banks have the same operating flexibility as rural affiliate banks was rejected.

In addition, the interview data suggested that the large financial and human resources available through a holding company system place affiliate banks in a better position to assume an active support role in local economic activities. This active role was described in relation to the local government sector by several bankers interviewed, but it is likely to apply to other areas as well (e.g., industrial development, downtown revitalization, housing.) The independent banks' ability to take such an active role may be constrained by their relatively small resource base. The potential exists for affiliates and independents to

behave differently in regard to their role in supporting local economic activities. Whether a difference actually exists in the role assumed by these two types of banks was not identified in this study, but is an important issue for future research.

Along similar lines, the differing regulations on equity to asset ratios also serve to potentially constrain the growth of independent banks relative to affiliates. This constraint on growth, in turn, may limit the ability of independent banks to grow and change consistent with their community's capital needs.

To summarize, this study showed three important differences between independent and affiliate banks: equity capital to asset ratio, operating flexibility, and potential range of services offered to the community. These differences result from the institutional structures of the two banks and, although they are not currently reflected in performance differences, may have implications for capital availability in nonmetropolitan areas in Virginia as deregulation progresses. In addition, the results of the coal region case studies, along with the results regarding agricultural lending, suggest that one type of banking institution may not be appropriate for all economic regions in the state. These results, in turn, suggest that capital availability to particular sectors of the local economy may be dependent upon the institutional structure of the local banking sector.

Implications for Capital Availability

The differences described above suggest that deregulation may have certain impacts on capital availability in nonmetropolitan areas in Virginia. A proliferation of affiliates could result, potentially, in a more active role for local banks in their communities' economic affairs. Local communities would have access to a greater pool of resources through affiliate banks. The result might be an increase in the capital available to finance local economic activities.

At the same time, however, these affiliates are inherently less flexible in decision making and less capable of designing policies to meet specific local needs. As a result, local capital needs could possibly be left unmet as capital is allocated within the holding company to less risky, higher return ventures in other areas of the state. These events could lead to capital outflows from nonmetropolitan areas, as a result of the decline in independent banks in rural areas. Evidence from Arizona and Colorado cited previously suggests that some slow growing nonmetropolitan areas may have reduced capital availability as a result of a branch rather than unit banking structure (Barkley, Potts, and Mellon).

It is not yet possible to determine the net effect of these two forces as the deregulation process is completed. However, this analysis does suggest that some behavioral or institutional differences exist between bank types that, at least currently, are not reflected in bank

performance differences in local capital markets. This similarity in bank performance may diminish as the deregulation process continues if, as expected, the holding company structure becomes predominant.

These results appear to support the institutional innovation theory of Davis and North. Affiliates and independents are separate types of institutions and, if affiliates continue to proliferate as a result of deregulation, this proliferation represents an innovation of a new banking institution. Affiliate banks and the holding company system, given their size and organizational advantage, are in a better position to compete and be profitable in a world of interstate banking and reduced distinctions between banks and nonbanks. It is likely that a second stage in the institutional innovation process may be seen in the next several years. Some of the bankers interviewed stated that independent banks will be forced to change in this new financial environment. The independent banking institution may evolve into the more specialized, retail-oriented institution as the innovation process continues.

Policy Implications

The deregulation of depository institutions has been promoted as a pro-efficiency move designed to improve competition between banks and nonbanks, as well as among banks themselves. The current deregulatory process can be viewed as a means of correcting the technical inefficiencies that were created by regulations stemming from

the wave of bank failures in the 1930's. However, this research suggests that there are some distributional considerations that need to be addressed in any evaluation of the deregulation process. In addition, the potential for increased instability in the financial system as a result of deregulation leads to a question of whether the public interest is served by this process. Particularly, the needs of small, rural areas (or regions) may require special attention.

The differences between bank types identified in this study suggest that the deregulation process may result in the proliferation of a banking institution with limited operating flexibility and where decision making is removed from the local level. As a result, financial resources and decision making power may be concentrated in metropolitan areas of Virginia, implying a less equitable distribution of both capital and power between metropolitan and nonmetropolitan areas of the state. Such a concentration of resources may imply a reduction in capital available to nonmetropolitan areas. According to Hoover, a greater proportion of capital would most likely remain in urban areas where the investment climate is well understood and where investments are viewed as less risky than those in rural areas.

Other results from this study, however, suggest that such concentration of financial resources in the holding company system may permit less conservative banking policies to be exercised in some less diversified economic regions in Virginia. If the difference between

affiliate and independent bank behavior identified in this study is representative of affiliate vs. independent bank behavior in other regions of the state, deregulation could result in a more, not less, equitable distribution of capital among regions in the state. Decision making power would still be more centralized than under a predominantly independent system, but capital availability to some less diversified nonmetropolitan regions might be enhanced.

Since the full impact of deregulation on the structure of Virginia's banking industry is yet to be determined, it is not possible to identify the net effect of the concentration and centralization of financial resources on nonmetropolitan capital availability. Concentration of financial resources can potentially lead to a more uneven distribution of capital, even while it increases the overall technical efficiency of the financial industry. As a result, distributional considerations should be an important component of any evaluation of the impact of deregulation. Any policy analysis of deregulation in the future should consider the tradeoffs between technical efficiency and the public interest inherent in most economic processes. The results of this study and the opinions expressed by the bankers interviewed correspond to these policy concerns.

The results from the coal region case studies suggest that for areas characterized by high risk investments, the holding company bank may be the most appropriate type of banking institution. While the

affiliate banking structure may provide a more appropriate fit for the economy in a less diversified, more risky area, the higher agricultural loans to total loans ratio for independent banks relative to affiliate banks suggests that independent banks may be the more appropriate type of bank for a primarily agricultural area. The local nature of the decision making process inherent in the independent banking structure puts the independent bank in a better position to identify the capital needs of the agricultural sector and to design bank policies that can best serve this local sector.

A final policy implication is suggested by these results. Deregulation is a macroeconomic policy designed to increase the technical efficiency of the financial services industry, viewed in a national context. This policy has apparently not considered the differential regional impacts that may result from deregulation. However, any evaluation of this macroeconomic policy should consider how its effects filter down to nonmetropolitan areas of the country and whether the impact on these regions is the same as that intended for the financial system overall. The evidence from the coal region case study and the evidence relating to differences in agricultural lending suggest that one type of banking institution is not necessarily most appropriate for all economies. These results suggest, in turn, that the impact of deregulation may not be uniform, but may vary from region to region. A relative proliferation of affiliate banking institutions may improve capital availability in some areas or in some economic sectors, while reducing the availability of capital in other areas or sectors.

These results suggest that the impact of deregulation on nonmetropolitan banking markets may be different than either its overall impact or the impact on more diversified metropolitan economies. Recognition of the potential for such differential impacts should be an integral part of future policy discussions related to banking and the financial services industry. Further research into the effects of national policies, such as interstate banking, on nonmetropolitan areas can help clarify the issues and provide the information necessary to enhance the ability of state and local officials to influence the policy making process.

Research Applications

Two important research applications are suggested by the results of this study. First, this study was able to identify differences between independent and affiliate banks by taking a more in-depth decision making approach, rather than considering only differences in performance measures, i.e., bank operating ratios. It is possible that local competitive conditions serve to constrain bank performance such that differences are not obvious. However, underlying differences between bank types, based on their institutional structure, are evident from the results of this analysis.

Therefore, the research methods used in this study should be extended to a larger sample of bankers to further clarify the

institutional differences between independents and affiliates. It may be necessary to modify the technique to utilize a mail rather than personal survey, in order to economically accommodate a larger sample. Such modification would be possible if the questionnaire was designed only to elicit the lexicographic ordering and determine operating flexibility. Given the knowledge gained through this case study analysis, it should be possible to clarify the questions in the survey to permit the respondents to answer through the mail, rather than during a personal interview. It is possible that some detail may be lost in such an approach, however. The approach used in this study is viewed as an important modification of the traditional way in which financial markets have been analyzed, i.e., evaluation of bank performance. The value of this approach is in recognizing the importance of the institutional context from which bank performance measures are generated.

Second, the types of differences identified between independents and affiliates suggest that if performance measures alone are analyzed, a longitudinal approach should be taken. If the differences in operating flexibility observed between independents and affiliates in this study are representative of the larger population of Virginia banks, it is possible that an analysis of aggregate performance measures for the two bank types, over a time period including cyclical fluctuations, may show important performance differences stemming from the independent banks' ability to respond to local economic conditions. Such an analysis may have value in clarifying the issues raised in this study and doing

so on a larger, more aggregate scale. The data for such an aggregate analysis should be available from published secondary sources (e.g., Federal Reserve, Federal Deposit Insurance Corporation.)

Finally, several research issues are raised by the results of this study and are worthy of future research effort. These are briefly described as follows:

1. In a post-deregulation environment, do affiliate banks control a greater percent of total county deposits than they did before deregulation? Do aggregate performance measures indicate differences in bank behavior in a post-deregulation environment? These questions are designed to determine whether affiliate banks do become increasingly important in nonmetropolitan areas as a result of deregulation. Performance differences could be analyzed ex post to see if changes in market structure as a result of deregulation are associated with performance differences between bank types.
2. Do affiliate banks provide more or less financial support to the particular sectors of the local economy, such as agriculture, as compared to independent banks? Do independent bankers consistently follow more conservative policies than affiliate bankers in less

diversified economic regions? Has the regulation requiring that independent banks maintain a higher equity capital to total assets ratio than affiliate banks served to restrict the asset growth of independent banks in nonmetropolitan areas? These questions are designed to clarify some of the tentative conclusions reached in this study. Further research is necessary to provide more definitive conclusions regarding these differences in bank behavior.

3. Are differences in operating goals identified when the decision making process of independent bank presidents is compared to that of holding company presidents operating in metropolitan areas? This question raises an issue that may be important in future studies of this type. All the bankers interviewed in this study can be described as local bankers, in the sense that they operate out of the local area. If, as described in this study, decision making in the holding company is centralized, it may be more appropriate to compare goal orderings for local independent bank presidents with those for the presidents of holding companies. Such an analysis would correct a possible deficiency of the current study. It is possible that such a comparison may show

important differences in decision making. The holding company presidents may be strict profit maximizers, given the fact that they are making decisions for a large corporation whose equity is traded on the stock exchange. Their institutional structure may constrain their decision making to a consideration of profit potential only. This issue should be explored in greater depth in any future application of the lexicographic ordering technique.

4. What role do local and national nonbank financial institutions play in the local economic growth process? How does their role influence the role played by banks, both independents and affiliates? This question raises the issue of nonbank financial institutions serving nonmetropolitan areas in the future. It is important to identify how these institutions function in nonmetropolitan areas currently and whether their role will expand in the future. The presence of nonbanks as viable competitors may alter the behavior of banks and the role they can assume in nonmetropolitan capital markets. How this change in the structure of local banking markets will affect capital availability is important to identify.

5. To what extent do the demand conditions in a nonmetropolitan banking market constrain bank behavior? How are the capital needs of nonmetropolitan areas changing? How are these changing capital needs being met by the financial services industry? The final issue raised by this study relates to the demand side of local capital markets. This study did not address local demand conditions. Demand conditions may serve to restrict the latitude with which bank decisions can be made, regardless of the institutional structure of the bank. Therefore, future research to analyze demand components would provide added insight into both the functioning of nonmetropolitan capital markets and the role of banks in the economic growth process. It is essential to identify the viability of nonmetropolitan areas in terms of their investment prospects and other characteristics of the capital needs of various sectors in the local economy. Incorporating these demand conditions into the lexicographic ordering technique could improve this technique as a model of bank operating behavior.

Summary

The value of this research is in its identification of differences in bank behavior that are fundamentally linked to the institutional structures of two bank types, i.e., independent unit banks or affiliates of statewide bank holding companies. Since these differences are related to institutional structure rather than current market structure, they can be expected to prevail in a post-deregulation environment. Consequently, the potential impacts of these differences on capital availability in nonmetropolitan areas, as described above, suggest how financial deregulation will affect nonmetropolitan areas of the country.

In addition, this study provides a better understanding of the differences between independent and affiliate banks in relation to their ability to meet the capital needs of nonmetropolitan areas. An understanding of these differences is particularly important for people involved in the economic growth and development process of nonmetropolitan areas. Either researchers or practitioners of rural economic development can use this information to define the appropriate role for each type of bank and related financial institutions in the process of rural economic change. In this way, the limitations of each institution in meeting capital needs can be recognized and their individual strengths exploited to better serve the economic growth process in local areas.

Appendix A

Bank Presidents' Questionnaire

1. In formulating the overall operating plans for your bank, indicate the importance you give to the following, ranking them in order of importance:

Rank

- ___ 1. Earn a reasonable return on equity
- ___ 2. Stimulate community growth
- ___ 3. Insure safety of depositors' money, i.e., fiduciary responsibility
- ___ 4. Earn a reasonable return on assets
- ___ 5. Place a satisfactory proportion of total loans within your service area
- ___ 6. Other (Please specify.)

2. What would you consider to be a reasonable return on equity? _____

What chance are you willing to run that you will fail to meet this acceptable level in any given year? _____

3. What policy(ies) could your bank implement to stimulate community growth?

What target(s) would you set to satisfy the policy(ies)? _____

What chance are you willing to run that you will fail to meet the target(s) in any given year? _____

4. What policy(ies) could your bank implement to insure the safety of your depositors' money?

What target(s) would you set to satisfy the policy(ies)? _____

What chance are you willing to run that you will fail to meet the target(s) in any given year? _____

5. What would you consider to be a reasonable return on assets? _____

What chance are you willing to run that you will fail to meet this acceptable level in any given year? _____

6. What would you consider to be a satisfactory proportion of loans to place within your service area? _____%

What chance are you willing to run that you will fail to meet this acceptable level in any given year? _____

7. What would you consider as satisfactory levels for other goals you may deem to be important? _____

What chance are you willing to run that you will fail to meet these acceptable levels in any given year? _____

8. In the portfolio category of "Obligations of states and political subdivisions," would you classify these obligations as primarily from municipalities:

- ___ 1. Within the county
- ___ 2. Within neighboring counties
- ___ 3. Within the state
- ___ 4. Outside the state

9. Would you classify these obligations as primarily:

- 1. General obligation bonds
- 2. Revenue bonds
- 3. Other (Please specify.)

What is the percentage breakdown for each of these categories?

10. Does your bank currently provide assistance to local governments in issuing bonds?

- 1. Yes
- 2. No

If yes, in what ways have you provided assistance in the past?

If yes, in what additional ways do you feel the bank could offer assistance?

If no, what are your reasons?

11. How do you establish the criteria you use for making lending decisions?

If an affiliate, do you make loan criteria decisions or are these made by the holding company and applied to your bank?

12. How are interest rates on loans and interest-bearing accounts set by your bank?

If an affiliate, do you set interest rates or are these set by the holding company?

13. How do you determine the allocation of capital among competing assets in your portfolio?

If an affiliate, is this allocation done by you or by someone at the holding company level?

14. What is your current interest rate on auto installment loans?
_____%

15. What is your current interest rate on short-term (less than one year) commercial and industrial loans? _____%

16. I am interested in identifying the rules which guide your decisions regarding allocation of assets within your portfolio. Please specify the particular rules, if any, you use to:
- a. Allocate total assets among loan classes, i.e., real estate, agricultural, individual, commercial and industrial.

 - b. Reduce the percent of assets in any category, particularly real estate loans.

 - c. Allocate total assets among securities, i.e., U.S. treasury, obligations of states, bonds, federal funds sold.

 - d. Allocate total assets between loans, securities, and cash.

 - e. Manage liabilities, i.e., demand deposits, time and savings deposits, federal funds purchased.
17. Are there any other rules or constraints under which you operate?
18. How would you describe the demand for capital in each of the following sectors now as compared to average demand over the past five years?
- a. Agriculture
 - ___ 1. Above average
 - ___ 2. Below average
 - ___ 3. Average

b. Commercial

- ___ 1. Above average
- ___ 2. Below average
- ___ 3. Average

c. Industrial

- ___ 1. Above average
- ___ 2. Below average
- ___ 3. Average

d. Household

- ___ 1. Above average
- ___ 2. Below average
- ___ 3. Average

e. Real estate

- ___ 1. Above average
- ___ 2. Below average
- ___ 3. Average

19. In what ways has this demand for capital affected your portfolio decisions?

20. What local, nonbank financial institutions provide the greatest competition for your institution?

- ___ 1. Savings and Loans
- ___ 2. Mutual savings banks

- ___ 3. Credit unions
- ___ 4. Other (Please specify.)

21. What national, nonbank financial institutions provide the greatest competition for your institution?

- ___ 1. Money market mutual funds
- ___ 2. Retail credit
- ___ 3. Financial networks, e.g., Sears
- ___ 4. Other (Please specify.)

22. Are the national institutions more important sources of competition or are the local institutions more important?

- ___ 1. National
- ___ 2. Local

23. Are there any other institutions, either within the county or in a nearby urban center that are important competitors with your institution?

24. Would you say that credit needs of county residents are met primarily by institutions located within the county or outside the county?

- ___ 1. Within
- ___ 2. Outside

Can you attach a percentage to this? _____

If outside, where are these institutions located?

- ___ 1. Neighboring county
- ___ 2. Neighboring urban center

- ___ 3. Distant urban center
- ___ 4. Other (Please specify.)

25. What impact do you feel that financial deregulation will have on banks operating in areas like this one?

26. Is your overall impression about these impacts favorable, unfavorable, or undecided?

Transition Banks

1. In terms of lending decisions, do you have more authority, less authority, or the same authority as before the merger?

- ___ 1. More
- ___ 2. Less
- ___ 3. Same

If there has been a change, please characterize that change.

2. In terms of allocating capital among competing assets in your portfolio, do you have more authority, less authority, or the same authority as before the merger?

____ 1. More

____ 2. Less

____ 3. Same

If there has been a change, please characterize that change.

3. In terms of risk, how does your bank's current portfolio compare with that before the merger? Does your current portfolio contain a greater percentage of high risk assets and loans, a lesser percentage of high risk assets and loans, or the same percentage of high risk assets and loans?

____ 1. Greater

____ 2. Lesser

____ 3. Same

4. Has your bank's ability to meet the community's credit needs changed since the merger?

____ 1. Yes

____ 2. No

If yes, in what ways has it changed?

5. What do you feel are the most important differences in your bank's operation and decision making process now as compared to before the merger?

Appendix B

Elicited and Optimal Goal Orderings from Lexicographic Ordering Model for Sample Bankers

Table B.1. Goal Orderings for Bankers in County A: Elicited and Optimal Solution from Linear Programming Model

	Banker 1	Banker 2
	<u>Elicited Goal Orderings</u>	
Goal 1	Return on assets	Return on assets
Goal 2	Safety of depositors' money	Market share
Goal 3	Stimulate community growth	Stimulate community growth
Goal 4	Market share	Satisfactory loan/deposit
Goal 5	Satisfactory loan/deposit	Safety of depositors' money
	<u>Optimal Solution Goal Orderings</u>	
Goal 1	Return on assets	Return on assets
Goal 2	Market share	Market share
Goal 3	Satisfactory loan/deposit	Satisfactory loan/deposit

Table B.2. Goal Orderings for Bankers in County B:
Elicited and Optimal Solution from Linear Programming Model

	Banker 3	Banker 4
	<u>Elicited Goal Orderings</u>	
Goal 1	Return on assets	Stimulate community growth
Goal 2	Safety of depositors' money	Return on assets
Goal 3	Stimulate community growth	Market share
Goal 4	Satisfactory loan/deposit	Satisfactory loan/deposit
Goal 5	Market share	Safety of depositors' money

	<u>Optimal Solution Goal Orderings</u>	
Goal 1	Return on assets	Return on assets
Goal 2	Satisfactory loan/deposit	Market share
Goal 3	Market share	Satisfactory loan/deposit

Table B.3. Goal Orderings for Bankers in County C:
Elicited and Optimal Solution from Linear Programming Model

	Banker 5	Banker 6
	<u>Elicited Goal Orderings</u>	
Goal 1	Return on assets	Return on assets
Goal 2	Stimulate community growth	Market share
Goal 3	Safety of depositors' money	Satisfactory loan/deposit
Goal 4	Market share	Stimulate community growth
Goal 5	Satisfactory loan/deposit	Safety of depositors' money

	<u>Optimal Solution Goal Orderings</u>	
Goal 1	Return on assets	Return on assets
Goal 2	Market share	Market share
Goal 3	_____	Satisfactory loan/deposit

Table B.4. Goal Orderings for Bankers in Coal Counties:
Elicited and Optimal Solution from Linear Programming Model

	Banker 7	Banker 8
	<u>Elicited Goal Orderings</u>	
Goal 1	Safety of depositors' money	Return on assets
Goal 2	Return on assets	Safety of depositors' money
Goal 3	Market share	Stimulate community growth
Goal 4	Stimulate community growth	Market share
Goal 5	Satisfactory loan/deposit	Satisfactory loan/deposit

	<u>Optimal Solution Goal Orderings</u>	
Goal 1	Return on assets	Return on assets
Goal 2	Market share	Market share
Goal 3	Satisfactory loan/deposit	Satisfactory loan/deposit

Appendix C

Formulation of Linear Programming Models for Bankers that Resulted in Optimal Solutions

The following definitions apply for the variables specified in the linear programming models:

X_1 = Cash and due

X_2 = U.S. treasuries

X_3 = Municipals

X_4 = Total loans

X_5 = Total assets (determined exogenously)

X_7 = Real estate loans

X_8 = Agricultural loans

X_9 = Commercial and industrial loans

X_{10} = Consumer/installment loans

X_{11} = Total deposits

X_{12} = Total market (county) deposits

X_{14} = Reserves (determined exogenously)

X_{15} = 1981 Real estate loans (determined exogenously)

Banker 1

Maximize X_4

Subject to:

$$\begin{aligned} -0.825 X_2 + .1041 X_3 + .1545 X_7 + .1681 X_8 \\ + .1327 X_9 + .1190 X_{10} \geq .01 X_5 \end{aligned}$$

$$X_{11} = .30 X_{12}$$

$$X_4 \leq .80 X_{11}$$

$$X_7 \geq .20 X_4$$

$$X_8 + X_9 \geq .25 X_4$$

$$X_{10} \geq .50 X_4$$

$$X_7 + X_8 + X_9 + X_{10} \leq X_4$$

$$X_3 \leq .05 X_{11}$$

$$X_2 \leq .10 X_{11}$$

$$X_1 + X_2 + X_3 + X_4 \leq X_5$$

$$X_1 \geq X_{14}$$

Banker 2

Maximize X_4

Subject to:

$$\begin{aligned} -0.825 X_2 + .1041 X_3 + .1545 X_7 + .1681 X_8 \\ + .1327 X_9 + .1125 X_{10} \geq .01 X_5 \end{aligned}$$

$$X_{11} = .35 X_{12}$$

$$X_4 \leq .85 X_{11}$$

$$X_7 \leq .60 X_4$$

$$X_9 \geq .20 X_4$$

$$X_{10} \geq 20 X_4$$

$$X_7 + X_8 + X_9 + X_{10} \leq X_4$$

$$X_1 + X_2 + X_3 + X_4 \leq X_5$$

$$X_1 \geq X_{14}$$

$$X_7 \geq .95 X_{15}$$

Banker 3

Maximize X_4

Subject to:

$$-0.825 X_2 + .1041 X_3 + .1545 X_7 + .1681 X_8 \\ + .1327 X_9 + .1125 X_{10} \geq .01 X_5$$

$$X_4 \geq .65 X_{11}$$

$$X_4 \leq .72 X_{11}$$

$$X_{11} \leq X_{12}$$

$$X_{10} \geq .30 X_4$$

$$X_7 \leq .50 X_4$$

$$X_7 + X_8 + X_9 + X_{10} \leq X_4$$

$$X_1 + X_2 + X_3 + X_4 \leq X_5$$

$$X_1 \geq X_{14}$$

$$X_7 \geq X_{15}$$

Banker 4

Maximize X

Subject to:

$$\begin{aligned} -0.825 X_2 + .1041 X_3 + .1545 X_7 + .1681 X_8 \\ + .1327 X_9 + .1200 X_{10} \geq .0125 X_5 \end{aligned}$$

$$X_{11} = .48 X_{12}$$

$$X_4 \leq .85 X_{11}$$

$$X_{10} \geq .20 X_4$$

$$X_9 \geq .40 X_4$$

$$X_7 + X_8 + X_9 + X_{10} \leq X_4$$

$$X_1 + X_2 + X_3 + X_4 \leq X_5$$

$$X_7 \geq .95 X_{15}$$

Banker 5

Maximize X_{11}

Subject to:

$$-0.825 X_2 + .1041 X_3 + .1545 X_7 + .1681 X_8 + .1327 X_9 + .1195 X_{10} \geq .01 X_5$$

$$X_7 \leq .40 X_4$$

$$X_9 \geq .30 X_4$$

$$X_{10} \geq .30 X_4$$

$$X_7 + X_8 + X_9 + X_{10} \leq X_4$$

$$X_1 + X_2 + X_3 + X_4 \leq X_5$$

$$X_7 \geq .95 X_{15}$$

$$X_1 \geq X_{14}$$

$$X_1 + X_2 + X_3 \geq .25 X_{11}$$

Banker 6

Maximize X_4

Subject to:

$$\begin{aligned} -0.825 X_2 + .1041 X_3 + .1545 X_7 + .1681 X_8 \\ + .1327 X_9 + .1190 X_{10} \geq .01 X_5 \end{aligned}$$

$$X_{11} = .20 X_{12}$$

$$X_4 \leq .80 X_{11}$$

$$X_7 \leq .75 X_4$$

$$X_{10} \leq .40 X_4$$

$$X_9 \leq .40 X_4$$

$$X_2 + X_3 \geq .25 X_{11}$$

$$X_1 \geq X_{14}$$

$$X_7 + X_8 + X_9 + X_{10} \leq X_4$$

$$X_1 + X_2 + X_3 + X_4 \leq X_5$$

$$X_7 \geq .95 X_{15}$$

Banker 7

Maximize X_4

Subject to:

$$-0825 X_2 + .1041 X_3 + .1545 X_7 + .1681 X_8 + .1327 X_9 + .1500 X_{10} \geq .02 X_5$$

$$X_{11} = .40 X_{12}$$

$$X_4 \leq .60 X_{11}$$

$$X_7 \leq .60 X_4$$

$$X_{10} \geq .25 X_4$$

$$X_9 \geq .20 X_4$$

$$X_2 \geq .20 X_{11}$$

$$X_3 \geq .12 X_{11}$$

$$X_1 \geq X_{14}$$

$$X_7 + X_8 + X_9 + X_{10} \leq X_4$$

$$X_1 + X_2 + X_3 + X_4 \leq X_5$$

$$X_7 \geq .95 X_{15}$$

Banker 8

Maximize X_4

Subject to:

$$\begin{aligned} -0.825 X_2 + .1041 X_3 + .1545 X_7 + .1681 X_8 \\ + .1327 X_9 + .1250 X_{10} \geq .01 X_5 \end{aligned}$$

$$X_{11} = .56 X_{12}$$

$$X_4 \leq .80 X_{11}$$

$$X_7 \geq .35 X_4$$

$$X_{10} \geq .30 X_4$$

$$X_9 \geq .35 X_4$$

$$X_7 + X_8 + X_9 + X_{10} \leq X_4$$

$$X_1 + X_2 + X_3 + X_4 \leq X_5$$

$$X_7 \geq .95 X_{15}$$

Appendix D

Portfolio and Operating Ratio Values from Profit

Maximization Model for Sample Bankers

Table D-1. Portfolio and Operating Ratio Values Predicted from Profit Maximization Model for Bankers 1 and 2

Variable	(\$1,000's)	
	Banker 1	Banker 2
Cash and due	2,344	-
U.S. treasuries	5,970	-
Municipals	2,985	-
Loans	47,757	-
Real estate loans	9,551	-
Agricultural loans	14,327	-
Commercial/industrial loans	0	-
Consumer loans	28,789	-
Deposits	59,697	-
Loans/Deposits	.80	-
Loans/Assets	.81	-
Agricultural loans/Total Loans	.30	-
Real estate loans/Total Loans	.20	-
Commercial/industrial loans/Total loans	.00	-
Consumer loans/Total loans	.06	-

Table D-2. Portfolio and Operating Ratio Values Predicted from Profit Maximization Model for Bankers 3 and 4

Variable	(\$1,000's)	
	Banker 3	Banker 4
Cash and due	633	229
U.S. treasuries	0	0
Municipals	0	0
Loans	15,785	21,650
Real estate loans	2,773	5,574
Agricultural loans	8,276	3,086
Commercial/industrial loans	0	8,660
Consumer loans	4,736	4,330
Deposits	21,924	25,471
Loans/Deposits	.72	.85
Loans/Assets	.95	.99
Agricultural loans/Total Loans	.52	.14
Real estate loans/Total Loans	.18	.26
Commercial/industrial loans/Total loans	.00	.40
Consumer loans/Total loans	.30	.20

Table D-3. Portfolio and Operating Ratio Values Predicted from Profit Maximization Model for Bankers 5 and 6

Variable	(\$1,000's)	
	Banker 5	Banker 6
Cash and due	-	648
U.S. treasuries	-	0
Municipals	-	9,543
Loans	-	30,539
Real estate loans	-	12,581
Agricultural loans	-	17,958
Commercial/industrial loans	-	0
Consumer loans	-	0
Deposits	-	38,173
Loans/Deposits	-	.80
Loans/Assets	-	.75
Agricultural loans/Total Loans	-	.59
Real estate loans/Total Loans	-	.41
Commercial/industrial loans/Total loans	-	.00
Consumer loans/Total loans	-	.00

Table D-4. Portfolio and Operating Ratio Values Predicted from Profit Maximization Model for Bankers 7 and 8

Variable	(\$1,000's)	
	Banker 7	Banker 8
Cash and due	1,450	0
U.S. treasuries	11,979	0
Municipals	7,187	0
Loans	35,937	194,373
Real estate loans	9,769	68,031
Agricultural loans	9,996	0
Commercial/industrial loans	7,187	68,031
Consumer loans	8,894	58,312
Deposits	59,894	242,966
Loans/Deposits	.60	.80
Loans/Assets	.64	.99
Agricultural loans/Total Loans	.28	.00
Real estate loans/Total Loans	.27	.35
Commercial/industrial loans/Total loans	.20	.35
Consumer loans/Total loans	.25	.30

References

- Anderson, Jock R., John L. Dillon, and J. Brian Hardaker. Agricultural Decision Analysis. The Iowa State University Press. Ames, Iowa. 1977.
- Barkley, David L., Glenn T. Potts, and Cindy Mellon. Bank Structure and Performance at the Nonmetropolitan Level: The Arizona and Colorado Experience. Technical Bulletin Number 251. Agricultural Experiment Station. The University of Arizona. Tucson, Arizona. 1984.
- Bell, Frederick W. and Neil B. Murphy. "Impact of Market Structure on the Price of a Commercial Banking Service." The Review of Economics and Statistics. 51(May 1969). 210-213.
- Benston, George J. "The Optimal Banking Structure: Theory and Evidence." Journal of Bank Research. Vol. 4(Winter 1973). 220-237.
- Bromley, Daniel W. "The Use of Discriminant Analysis in Selecting Rural Development Strategies." American Journal of Agricultural Economics. Vol. 52. May 1971. 319-322.
- The Bureau of Financial Institutions. Laws of Virginia Relating to Banking and Finance. State Corporation Commission. The Michie Company. Charlottesville, Virginia. 1980.
- _____. 1982 Annual Report. State Corporation Commission. Richmond, Virginia. December 31, 1982.
- Cargill, Thomas F. and Gillian G. Garcia. Financial Deregulation and Monetary Control. Hoover Institution Press. Stanford, California. 1982.
- Checchi and Company. Capital Resources in the Central Appalachian Region. Appalachian Regional Commission. Research Report No. 9. Appendix C. Washington, D.C. August 1969.

- Churn, Virginia. "Women's Bank Merger Ratified." The Richmond Times-Dispatch. March 22, 1984. B1.
- Combs, Robert P., Glen C. Pulver, and Ron E. Shaffer. Financing New Small Business Enterprise in Wisconsin. Agricultural Bulletin R3198. University of Wisconsin-Madison. March 1983.
- Dahl, David S., Stanley L. Graham, and Arthur J. Rolnick. "Looking for Evidence of Noncompetitive Behavior in Minnesota's Banking Industry." Federal Reserve Bank of Minneapolis Quarterly Review. Vol. 1. No. 2. Fall 1977. 1-7.
- Davis, Lane E. and Douglass C. North. Institutional Change and American Economic Growth. Cambridge University Press. New York, New York. 1971.
- Dubey, Vinod. "The Definition of Regional Economics." Journal of Regional Science. V, No. 2(1964). 25-29.
- Encarnacion, Jr., Jose. "Constraints and the Firm's Utility Function." Review of Economic Studies. Vol. 31. 1964. 113-120.
- Ferguson, C. E. "The Theory of Multidimensional Utility Analysis in Relation to Multiple-Goal Business Behavior: A Synthesis." Southern Economic Journal. 32(2). 1965. 169-175.
- Ferguson, C. E. and J. P. Gould. Microeconomic Theory. Fourth Edition. Richard D. Irwin, Inc. Homewood, Illinois. 1975.
- Glassman, Cynthia A. "The Impact of the Bank Regulatory Environment on Small Business Financing." Proceedings of a Conference on Bank Structure and Competition. Federal Reserve Bank of Chicago. April 1982. 152-165.
- Gruchy, Allan Garfield. Supervision and Control of State Banks in Virginia. D. Appleton-Century Company Inc. New York, New York. 1937.

Halter, Albert N. and Gerald W. Dean. Decisions Under Uncertainty. South-Western Publishing Co. Chicago, Illinois. 1971.

Hartman, L. M. and David Seckler. "Toward the Application of Dynamic Growth Theory to Regions." Journal of Regional Science. VII, No. 2(1967). 167-173.

Heggestad, Arnold A. and John J. Mingo. "The Competitive Condition of U.S. Banking Markets and the Impact of Structural Reform." The Journal of Finance. Vol. XXXII. No. 3. June 1977. 649-661.

_____. "Prices, Nonprices, and Competition in Commercial Banking." Journal of Money, Credit, and Banking. February 1976. 107-117.

Heylar, John and Julie Salamon. "Big Banks Set Agenda for the Entire Industry as Regulation Loosens." The Wall Street Journal. November 18, 1982.

Hooker, R. W. The Effect of the Financial Community's Structure on the Commercial Bank's Role as a Financier of Regional Growth. Discussion Paper No. 5. Center for Economic Development. The University of Texas at Austin. February 1970.

Hoover, Edgar M. An Introduction to Regional Economics. Second Edition. Alfred A. Knopf, Inc. New York, New York. 1975.

Kleinbaum, David G. and Lawrence L. Kupper. Applied Regression Analysis and Other Multivariate Methods. Duxbury Press. North Scituate, Massachusetts. 1978.

Kolb, Robert W. "Affiliated and Independent Banks." Journal of Banking and Finance. 5(1981). 523-537.

Lemann, Nicholas. "Big-Time Banking and the Little Guy." The Washington Post. November 7, 1983. A17.

- Lin, William, G. W. Dean, and C. V. Moore. "An Empirical Test of Utility vs. Profit Maximization in Agricultural Production." American Journal of Agricultural Economics. Vol. 56. No. 3. August 1974. 497-508.
- McCarthy, Ward and John Walter. "A Review of Bank Performance in the Fifth District, 1982." Economic Review. Federal Reserve Bank of Richmond. Volume 69/4. July/August 1983. 3-11.
- Nyankori, J. C. O. and G. H. Miller. Regulatory Reform Impact on Rural Banking and Credit: The Case for Commercial Banks and Rural Development in South Carolina. Southern Rural Development Center. Mississippi State University. January 1983.
- Parcell, David C. State Banks and the State Corporation Commission: A Historical Review. Technical Associates, Inc. Richmond, Virginia. 1974.
- Rhoades, Stephen A. "The Competitive Effects of Interstate Banking." Federal Reserve Bulletin. January 1980. 1-8.
- _____. "Statewide Banking Structure and Performance During the 1970's." Staff Studies. Federal Reserve Board. 1980.
- _____ and Donald T. Savage. "Can the Small Banks Compete?" The Bankers Magazine. V. 164. N. 1. January-February 1981. 59-65.
- Rose, Peter S. and Donald R. Fraser. "The Impact of Holding Company Acquisitions on Bank Performance." The Bankers Magazine. V. 156. N. 2. Spring 1973. 85-91.
- Roumasset, James A. Rice and Risk. North-Holland Publishing Company. New York, New York. 1976.
- Rural Affairs Study Commission. A Report to the Governor and the General Assembly of the Commonwealth of Virginia. 1971.

- Savage, Donald T. "Developments in Banking Structure, 1970-81." Federal Reserve Bulletin. February 1982. 77-85.
- Scherer, F. M. Industrial Market Structure and Economic Performance. Second Edition. Houghton Mifflin Company. Boston, Massachusetts. 1980.
- Schultz, Theodore W. "The Economics of Being Poor." Nobel Lecture. Stockholm, Sweden. December 10, 1979.
- Shaffer, Ron. "Wisconsin Commercial Banks' Effect on Community Economic Development." Economic Issues. 15(November 1977). Department of Agricultural Economics. University of Wisconsin-Madison.
- Snedecor, George W. and William G. Cochran. Statistical Methods. Sixth Edition. The Iowa State University Press. Ames, Iowa. 1967.
- Snider, Thomas E. "The Effect of Merger on the Lending Behavior of Rural Banks in Virginia." Journal of Bank Research. Vol. 4(Spring 1973). 52-57.
- Staniforth, Sydney D. and Joel P. Haggard. "The Availability of Money in Rural Communities." Economic Issues. 70(July 1982). Department of Agricultural Economics. University of Wisconsin-Madison.
- Stevens, Joe B., Karen L. Bunch, and Brian M. Soth. New Shops on Main Street: A Growth Industry? Report prepared for Regional Research Project W-118. Department of Agricultural Economics. Oregon State University.
- Struck, Peter L. and Lewis Mandell. "Impact of Financial Deregulation on Small Business: Evidence from April 1980." Proceedings of a Conference on Bank Structure and Competition. Federal Reserve Bank of Chicago. April 1982. 181-193.
- Sullivan, Patrick J. Examining the Municipal Bond Market. USDA. ERS. EDD. Rural Development Research Report Number 34. January 1983.

Todaro, Michael P. Economic Development in the Third World.
Longman Publishing Co. New York, New York. 1977.

**The vita has been removed from
the scanned document**