Strategic Adaptation in the Banking Industry: An Exploration of the Antecedents and Consequences of Strategic Change Following Deregulation.

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STRATEGIC ADAPTATION IN THE BANKING INDUSTRY: 
AN EXPLORATION OF THE ANTECEDENTS AND 
CONSEQUENCES OF STRATEGIC CHANGE 
FOLLOWING Deregulation

A Dissertation
Submitted to the Graduate Faculty of the 
Louisiana State University and 
Agricultural and Mechanical College 
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Doctor of Philosophy

in 

Business Administration

by 
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December 1994
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ABSTRACT

This dissertation examined the antecedents and consequences of strategic change in the commercial banking industry between 1980 and 1987. Based on a review of the literature, a conceptual model was developed that predicted change would be influenced by two factors, adaptive forces and inertial forces. Adaptive forces include two factors that have been hypothesized to encourage change, prior performance and slack resources. Inertial forces include two factors sometimes thought to inhibit change, organizational size and age. Change outcomes were predicted to be influenced by degree of change and moderated by adaptive and inertial forces. Guided by previous theoretical and empirical research, cluster analysis was used to measure strategic change and degree of change.

The conceptual model proved to be useful in understanding the relationship between certain firm level factors and the propensity of organizations to change strategies. Some evidence was found to support the notion that prior performance, slack resources, and age are all important antecedents to change. Specifically, declining performance and slack resources in the form of excess capital were found to encourage change as predicted. Contrary to predictions, age was found to be a positive force for change.
Change was found to have positive consequences for the banks in this study; i.e. it was positively related to performance and survival. The relationship between change and performance became more clear when degree of change was considered. Those banks that underwent moderate levels of change outperformed those that did not change as well as those that underwent more drastic changes, suggesting a curvilinear relationship. Age and slack resources were found to moderate the change performance relationship as well. Specifically, for firms that changed strategies, age and slack resources in the form of liquidity were found to be negatively related to performance. The findings concerning slack were surprising, however, high levels of liquidity may suggest risk aversion on the part of banks. Overall, the findings provide some evidence to support the conceptual model and they lend credence to the major assumptions underlying the strategic management perspective.
CHAPTER 1

INTRODUCTION

Major changes in technology, shifts in socioeconomic conditions, and regulatory changes can and often do result in the restructuring of entire industries (Meyer, Brooks, and Goes, 1990). Such discontinuous environmental changes can render certain strategies and organizational competencies obsolete and change the basis of competition within industries (Tushman and Anderson, 1986). The strategic management literature suggests that managers have considerable latitude in altering their firm's competitive strategies and reconfiguring resources in response to these environmental changes (Porter, 1991; Hofer and Schendel, 1978). In many cases such alterations are seen as necessary to maintain performance and ensure continued survival of the organization.

Despite its emphasis in the strategic management literature, the extent to which managers are able to successfully alter their competitive strategies in response to environmental discontinuities remains a source of debate (Boeker, 1989; Romanelli and Tushman, 1986). Population ecologists emphasize the role of inertial forces that largely preclude major organizational change (Hannan
and Freeman, 1977; 1984). Furthermore, when changes are attempted they tend to be disruptive and increase the organizations risk of failure (Hannan and Freeman, 1984). This viewpoint suggests that environmental selection more accurately explains changes in strategies within an industry over time. Organizations whose strategies fit the environment survive and others are "selected out." Thus changes in strategy within a given population are said to occur due to selection and replacement rather than strategic adaptation (Singh, House, and Tucker, 1986).

Although the strategic management and selection perspectives are usually seen as conflicting (Astley and Van de Ven, 1983), it has been argued that a richer understanding of strategic adaptation may be obtained by considering them simultaneously (Mascarenhas, 1989; Cook, Shortell, Conrad, and Morrisey, 1983; Ginzberg and Bucholtz, 1990). That is, the extent to which either view is salient may depend on factors peculiar to the situation or the organization. For example, it has been suggested that the selection arguments may be more salient when focusing on changes in the core features of the organization (Singh, House, and Tucker, 1986; Scott, 1987), changes that fail to build on established routines and competencies (Haveman, 1992), and when predicting the outcomes of change for older, larger, and more complex organizations (Hannan and Freeman, 1984). Similarly,
strategic management theorists have argued that the relationship between strategic adaptation and performance is likely to depend on factors such as the degree or type of change attempted (Snow and Hambrick, 1980; Nadler, 1988; Shortell, Morrison, and Friedman, 1990), the need for change (Beer, 1988; Shortell et. al, 1990), and the resources available to implement change (Ginsberg and Bucholtz, 1990). In other words, predictions concerning the propensity of organizations to engage in strategic change and the outcomes of that change may be influenced by various organizational and contextual factors.

To date surprisingly little progress has been made in understanding the degree to which strategic change at the business level can be successfully managed (Ginsberg, 1988; Zajac and Shortell, 1989). Relatively few empirical studies have attempted to test the basic proposition that strategic change enhances organizational effectiveness, and those that have report mixed results. The difficulty associated with doing large scale longitudinal research and the relative ease of access to large scale 'static' data bases is no doubt one reason for this situation (Ginsberg, 1988). However, confusion and controversy over basic conceptual issues such as how strategy is defined and what constitutes a strategic change have also hampered research (Ginsberg, 1988). Consequently, traditional strategic management prescriptions regarding the need to respond to
environmental threats and opportunities by altering strategies are only thinly supported by empirical evidence at present (Ginsberg, 1988; Guarino, 1991).

This study is driven by three basic research questions, two of which have been the focus of much of the strategic change research performed to date. The first two questions are:

1. Do organizations engage in strategic change following environmental discontinuities?
2. Do those organizations that change strategies following major environmental discontinuities improve their performance and survival chances?

The research results suggest that strategic change is not uncommon following environmental discontinuities. Nevertheless, more research is needed to explore the first question. First, the evidence is far from overwhelming. The question lends itself to single industry studies, leading to questions of generalizability. Also, the answer to this question may depend on how strategy and strategic change are conceptualized and measured. These issues suggest the need for replication in different settings, using different measures and methods. Second, the question of why some organizations change and others do not needs to be addressed. A growing number of studies have begun exploring this issue, but many questions remain.
The answer to the second question has proven much more elusive. Few studies have examined change outcomes, and those have produced mostly conflicting or inconclusive results. This indicates the need for closer examination of strategic change and change outcomes. As noted, the conceptual literature has begun to focus on reconciling the divergent views by considering different contexts that may alter change and change outcomes. Factors such as the type or degree of change, age, size, prior performance, and slack resources have all been hypothesized to impact the propensity to change, and a few studies have suggested that such variables may moderate change outcomes. In short, both the theoretical and empirical literature suggest that the answer to the above questions may be, "it all depends."

Therefore, while examining the first two questions, this study will focus on a third, less explored, question:

3. To what extent is the relationship between change in strategy, performance, and survival influenced by firm and situation specific factors?

Specifically, it will be argued that the outcomes of strategic change can best be understood and predicted by simultaneously considering three important categories of variables; adaptive forces that encourage and enable change, inertial forces that retard change (Ginsberg and Bucholtz, 1990), and the degree of change sought (Singh et al., 1986; Haveman, 1992).
The answers to these questions have a great deal of significance for both academicians and practitioners. Ginsberg (1988) notes that no generalizable conclusions can be drawn from the current research concerning the performance outcomes of strategic change. One reason for this is that relatively few studies have attempted to examine the contextual factors that may determine whether changes are adaptive or disruptive (Singh et al., 1986). If the answer to the first two questions is "it all depends", then finding the circumstances under which strategic change is more likely to be adaptive has a great deal of significance for future researchers examining the topic and managers contemplating change.

The Study

Site

This dissertation examines the antecedents and consequences of strategic change in the commercial banking industry between 1980 and 1987. The commercial banking industry provides an interesting and appropriate setting for examining the outcome of strategic change. The industry underwent a major change in its competitive environment following the Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980, and the Garn-St. Germain Act of 1982. These regulatory changes placed extreme pressure on bank profit margins by removing interest rate ceilings on the deposit side and
removing artificial entry barriers, thus increasing competition on the lending side. In addition, during the early 1980's banks were faced with changing technological and general economic environments that further impacted the competitive structure of the industry (Ballarin, 1986). As a result, commercial banks were forced to reconsider their basic competitive strategies, and make decisions concerning the markets in which they would operate and the products and services they would offer (Storrs, 1988; Tregoe, Tobia, and Zimmerman, 1988).

Scope of the Study

This study concerns itself with changes in the content of business level competitive strategy and the outcomes of those changes. Three components are said to describe an organization's competitive strategy at the business level; scope, competitive weapons, and segment differentiation (Chrisman, Hofer, and Boulton, 1988). Scope, the component of interest in this study, refers to the basic choices an organization must make regarding products or services offered to customers, geographic markets served, and technologies (Abell, 1980). Although the use of narrow definitions of strategy are said to increase the risk of specification error (Ginsberg, 1988), its use is justified in this study for several reasons. First, the majority of the studies examining strategic groups or strategic change in the strategic management literature have primarily
relied on some aspect of product or market scope to measure strategy (Bauerschmidt and Chrisman, 1993). Second, the population ecology literature has commonly focused on the breadth of product offerings (niche-width) to differentiate organization forms (Freeman and Hannan, 1983; Carroll, 1987). In fact, Havemann (1992) has argued that products offered, markets served, and technology are the most important factors in defining organization form. Finally, it has been noted that the range of products offered and markets served have become increasingly important strategic considerations for commercial banks in a deregulated environment (Storrs, 1988; Austin and Mandula, 1985). Thus, product/market scope appears to be an appropriate strategic component on which to differentiate commercial banks.

Most strategic management studies that have examined the outcomes of strategic change have focused on some aspect of financial performance to gauge success. Population ecologists, however, have argued that these studies may be biased because they fail to consider organizational failure as an outcome (Hannan and Freeman, 1989; Freeman and Boeker, 1984). In other words, they are biased to the extent that they only examine surviving organizations. If, in fact, organizational mortality is a common event and is associated with organizational change as the population ecologists argue, samples that exclude
failed firms can be argued to be biased. Thus, this study will include failed firms in the sample and, in addition to examining performance, will specifically examine the impact of change on organizational survival.

Organization of the Study

This dissertation contains seven chapters. Following this introductory chapter, the second chapter will briefly summarize the events occurring in the banking industry during the time frame of the study. The third chapter summarizes the conceptual and empirical literature relevant for this study. Chapter four further develops the theoretical framework and proposes specific hypotheses to be tested. Chapter five outlines the research methodology used in this study. This will include a discussion of data sources, empirical measures, and methods of statistical analysis. Chapter six discusses the results of the statistical analysis and the final chapter provides an overall discussion of the conclusions and implications of the findings.
CHAPTER 2

BANKING IN THE 1980'S: AN INDUSTRY IN TRANSITION

Regulators have sought to control the activities of commercial banks on the federal and/or state level in three basic ways: limiting the range of products and services offered, restricting geographic expansion, and regulating interest rates. Commercial banks have traditionally been prohibited from offering certain services, such as investment and insurance underwriting, primarily due to the Glass-Steagall Act of 1932. The primary legislation in the area of geographic expansion is the McFadden Act, which gave each state the right to make decisions regarding branch banking. Subsequent rulings have placed the issue of interstate banking in the hands of individual states as well. Prior to 1980, interest rates on the liability side were regulated through the Federal Reserve System's "Regulation Q." This placed ceilings on interest rates paid on deposits and in effect gave commercial banks a monopoly on demand deposits. Interest rates on loans have been controlled on the state level, but are typically not a factor in banking activities.

The Depository Institutions Deregulation and Monetary Control Act (DIDMCA) of 1980, and the Garn-St. Germain Act
of 1982 are widely acclaimed to represent the biggest change for commercial banks since the 1930's. The direct implication for commercial banks was a lifting of most interest rate restrictions imposed by regulation Q. Among other things, the DIDMCA phased out interest rate ceilings on time deposits, and allowed the payment of interest on checking accounts, while Garn-St Germain allowed the establishment of interest bearing Money Market Demand Accounts. These actions were designed to help banks stem the outflow of deposits to higher paying money market funds. While accomplishing this task, price deregulation created a problem by narrowing interest rate spreads; i.e., the difference between the interest rates banks pay depositors and collect from borrowers. Thus, banks were pressured to lend more money at higher rates.

Another indirect but highly significant implication of the DIDMCA and Garn-St. Germain, is that they removed most of the barriers that separated other financial intermediaries from commercial banks. Savings and Loans, Mutual Savings Banks, and Credit Unions were given greatly expanded product domains, including the right to provide checking accounts and offer a variety of loans and services that were traditionally the primary domain of commercial banks. Thus, commercial banks lost their legal monopoly on checking accounts (a very important competitive advantage),
and experienced significantly increased competition in the lending arena.

At this point, commercial banks remain rather highly regulated in the product/service and geographic domains, though strides toward deregulation have occurred over the last decade. The Glass-Steagall Act remains in force, but individual banks have managed to win court cases allowing them to engage in activities normally reserved for the brokerage business. Thus the door has been opened for product diversification into new areas. As noted, geographic regulation remains largely the purview of individual states, and states have varied considerably in the rate and extent to which they have allowed branching and interstate banking (Reger et al, 1992). Thus, deregulation in these areas has proceeded in a rather sporadic basis over the last decade.

It is important to note, that during this same time period the commercial banking industry was also subjected to competitive pressures only indirectly related to deregulation. First, there was increased competition from non-traditional sources, including insurance companies, retailers, security dealers, and foreign banks (Roussakis, 1989). The reason for this incursion is rather complex and not completely understood (Ballarin, 1986) though it is partially the result of regulatory, economic, and technological changes that occurred during the 1970s and
80s. It is notable that these competitors were able to extend practically all of the services offered by commercial banks, while not being subject to product and geographic constraints still imposed on the industry. Though more recent legislation has been designed to eliminate this disparity by imposing constraints on entrants, for most of the decade banks were (and to a large extent still are) faced with a considerable competitive disadvantage.

A second trend noted was that large U.S. corporations began reducing their cost of debt during the 1970's and 80's by circumventing intermediaries and going directly to capital markets (Ballarin, 1986). This has been accomplished primarily through the use of commercial paper (short term unsecured promissory notes). As a result, commercial banks have seen a portion of their market considered to be the most attractive severely diminished.

The point of the above discussion is to note that the environment for the commercial banking industry became decidedly more hostile during the 1980's. In terms of Porter's (1980) five forces model the banking industry experienced significant changes in barriers to entry, substitute products, and bargaining power of buyers and suppliers. As noted above regulatory and other environmental changes permitted entry by thrifts and non-traditional competitors into the traditional domains of
commercial banking. This, along with the proliferation of substitute products on both the supply and demand sides led to increased power on behalf of both suppliers and users of funds. The net effect on commercial banks was an increase in cost of funds, coupled with a less munificent lending environment.

Evidence of the difficulties experienced in the industry lies in the record number of bank closures that occurred during the last decade (see Figures 1 and 2). To get an idea of the severity of this problem, over 844 banks failed between 1982 and 1988, compared to 190 failures during the entire 30 year prior to 1980 (Roussakis, 1989). Bank failures in 1987 and 1988 each totaled more than the aggregate number occurring during the period 1950-1979.

Given the above scenario, the banking industry would seem to be a very appropriate setting in which to examine change in strategic content. There can be little doubt that deregulation represents a major environmental change for the industry, and the change would appear to be significantly threatening to cause firms to consider changing strategy. Also, the nature and timing of regulatory changes can be identified objectively. Finally, the industry contains a large number of comparable firms for which archival data is available.
Figure 1. Failed Banks
Figure 2. Problem Banks
CHAPTER 3

CONCEPTUAL AND EMPIRICAL LITERATURE

The purpose of this chapter is to review the relevant theoretical and empirical perspectives on strategic change. First, the various theoretical perspectives on strategic change will be addressed, then the empirical research will be reviewed.

Perspectives on Organizational Adaptation

Theories of organizational adaptation can be classified into three basic categories; natural selection theories, rational adaptation theories, and random transformation theories (Hannan and Freeman, 1984; Singh, House, and Tucker, 1986). The following section briefly summarizes the major points associated with each of these approaches.

Natural Selection

The essence of the natural selection view is summed up by Hannan and Freeman (1989) as follows:

..most of the variability in the core structures of organizations comes about through the creation of new organizations and organization forms and the demise of old ones. These perspectives argue that existing organizations, especially the largest and most powerful, rarely change strategy and structure quickly enough to keep up with the demands of uncertain, changing environments. They emphasize that major innovations in organizational strategy and structure occur early
in the life histories of individual organizations and of organizational populations (p. 11).

Selection arguments are premised on the notion that strong inertial forces constrain organizations from initiating and implementing changes to the core features of the organization (Hannan and Freeman, 1977; 1984; 1989). Inertial forces arise from both internal arrangements (investments in assets, information constraints, internal politics, and history) and the environment (legal barriers, information constraints, and legitimacy constraints). These inertial forces serve to reduce the frequency and speed of organizational change and the degree to which it can be planned and controlled (Hannan and Freeman, 1984; 1989). Thus, selection occurs through an interaction of relatively immutable organizational characteristics and changing environmental circumstances (Carroll, 1987). When organizational strategy and structure fit the environment, selection is favorable; when they do not, selection is unfavorable.

It is important to note that the selection argument does not require that inertial forces preclude organizational change; merely that they render attempts at changing ineffective or dysfunctional. The selection theorists argue that one way they do this is by slowing down the change process. Organizations that fail to learn about their environments and modify strategies at a faster rate than the environment will remain in a constant state.
of misalignment and are apt to reduce their odds of survival (Hannan and Freeman, 1984). Thus, to the extent that organizations remain relatively inert, i.e., their strategies and structures change at a slower rate than the environment, the selection perspective can be argued to be salient.

Selection theorists have further asserted that changes to the core aspects of the organization; i.e., goals, forms of authority, technology, and marketing strategy, rob the organization of survival value (Hannan and Freeman, 1984). Changes of a strategic nature typically upset established work routines, require the hiring of new employees or retraining of existing employees, disrupt communication patterns, and force the organization to forge new relationships with customers and suppliers (Haveman, 1992; Singh, House, and Tucker, 1986; Hannan and Freeman, 1984; 1989). This process of dismantling and rebuilding internal routines and external relationships also leaves the organization vulnerable to increased conflict as rival constituents seek to influence the outcome in a manner that benefits their own interest (Hannan and Freeman, 1984). Thus, during reorganization resources are diverted away from the production of goods and services and toward the reorganization effort and other non-productive uses. This redirection of resources reduces the organization's reliability of performance to that of a new organization,
thus subjecting the firm to "liability of newness" 
(Stinchcombe, 1965; Hannan and Freeman, 1984). In short, according to the selection perspective, efforts devoted to reorganization severely reduce efficiency, which leads to poor performance and increased risk of failure (Haveman, 1992).

Rational Adaptation

The rational adaptation view asserts that managers and/or dominant coalitions are able to influence organizational change, and that adaptation in response to changed environmental circumstances is likely to have a positive influence on organizational performance and probability of survival. Various theoretical approaches revolve around this central theme, though they tend to differ in their explanations of what drives change and the degree of choice available to managers. Some of the theoretical perspectives that fall under this general category are contingency theory (Burns and Stalker, 1961; Lawrence and Lorsch, 1967), resource dependency (Aldrich and Pfeffer, 1976; Pfeffer and Salancik, 1978), institutional theory (Scott and Meyer, 1983), and the strategic management perspective (Andrews, 1971; Schendel and Hofer, 1979).

Contingency Theory

The underlying premises of contingency theory are: 1) there is no one best way to organize; and 2) all ways of
organizing are not equally effective (Galbraith, 1973). Contingency theorists also assume a strong causal relationship between the environment, internal structures, and performance (Lawrence and Lorsch, 1967). The general notion is that organizations who best match their internal structural features to external demands of the environment will achieve the best performance (Scott, 1987).

The above premises are actually common to some degree in all the rational adaptation views, however, contingency theory is different in several aspects. First, the general emphasis is on matching internal structural features to various environmental demands. For example, Lawrence and Lorsch (1967) found evidence to suggest that higher levels of environmental complexity and uncertainty require a greater degree of structural differentiation and integration. Second, contingency theorists stress the environment as the driving force, with organizations confined to a reactionary role. Thus, this approach is perceived to be more deterministic than some of the other rational adaptation perspectives. Finally, the ability of firms to adapt their structures to changing environments is implied, but not a central concern. In fact, some have argued that contingency theory can be seen as being consistent with either a rational adaptation or natural selection view (Scott, 1987). The overriding concern seems to be in understanding the structural contingencies.
required by various environments, and not in understanding how those features were obtained.

Resource Dependency

Resource dependency theorists take a less deterministic view, suggesting managers often act upon as well as adapt to their environments in order to reduce dependencies and control critical resources (Aldrich and Pfeffer, 1976; Pfeffer and Salancik, 1978). The notion here is that firms must acquire and hold on to scarce environmental resources to prosper and survive. Because organizations are not internally self-sufficient, they must rely on resources from their environment, and thus become interdependent with outside organizations. The degree of dependence varies, depending on the importance and scarcity of the resources. Underlying this perspective is Emerson's (1963) idea that power and dependency are related. If a firm becomes dependent on another for acquiring scarce resources, then the other firm has power over the first. Interorganizational dependency offers the opportunity for political and economic influence, thus increasing uncertainty for the dependent firm.

To reduce dependencies and acquire scarce resources, firms engage in a number of "bridging" strategies to deal with their environments. Such strategies include bargaining, contracting, co-optation, joining trade associations, lobbying, engaging in joint ventures,
diversification, and merging with other firms (Scott, 1987). From this perspective, effective managers are seen as those that can both react to changing environmental circumstances and act in ways to alter their environments so as to reduce uncertainties and dependencies. Thus, the ability to adapt is central to the resource dependency view.

Institutional Theory

Like contingency theorists, institutional theorists also emphasize the need for achieving a fit between formal structure and the environment, but the focus here is on the institutional environment and the need for legitimacy (Scott and Meyer, 1983). Institutional environments consist of various rules and requirements to which individual organizations must conform to receive legitimacy and support. For some organizations, such environments demands may be more crucial for survival than competitive, or technical demands, e.g. schools, hospitals, and mental health clinics (Scott, 1987).

Institutional theorists stress the need for organizations to adapt to changing institutional rules in order to insure survival. Such adaptation may take the form of adopting both formal and informal structural requirements, incorporating procedures, and hiring personnel (Scott, 1987). Examples include conforming to certain structures and procedures to meet standards for
accreditation, incorporating popular structures or management tools, and obtaining personnel on the basis of meeting certain licensing requirements. Institutional theorists stress that such adaptation may be required by strong institutional pressures, regardless of technical requirements. Thus, institutional theorists also stress the need for and ability to adapt to environmental pressures, but for different reasons than suggested by the contingency and resource dependency theorists.

Strategic Management

The strategic management perspective, perhaps the most dominant of the adaptation theories, is distinct from the other perspectives due to its greater emphasis on managerial behavior and choice, and its explicit focus on formulation and implementation of organizational strategies (Tushman and Romanelli, 1985). Strategic management can be viewed as an adaptive process, whereby managers seek to achieve a match between an organization's resources and skills and its external environment, with strategy being the basic alignment mechanism (Andrews, 1971; Schendel and Hofer, 1979; Chakravarthy, 1982; Miles and Snow, 1984). The quality of a firm's adaptation can be judged by the degree to which current strategic decisions build on the existing stock of organizational resources and skills and the degree to which these resources are utilized to take advantage of market opportunities (Cool and Schendel, 1988;
Chakravarthy, 1986). Strategies that are not appropriate given the current competitive environment or that are not congruent with the organization's resources are less likely to be effective than those that exhibit a good "fit" along both these dimensions. In the language of traditional strategic analysis, organizations obtain superior performance by implementing strategies that exploit internal strengths and avoid weaknesses, while responding to market threats and opportunities. Thus, strategic choice and adaptation are central to the strategic management process.

Although the strategic management perspective emphasizes strategic choice and adaptation, it is important to note that most theorists recognize difficulties associated with changes in strategic positions. Choosing an appropriate strategic response to changing environmental circumstances requires the maintenance of an appropriate resource configuration to support such a change. Such resources usually involve both tangibles and intangibles that may or may not be readily available in factor markets (Barney, 1986; 1991). If resources are readily available they may require large initial capital outlays. Resources that are not readily available must be accumulated over time, placing the organization in a position of operating at a relative disadvantage to its competitors. Such costs and penalties associated with moving between strategic
groups are commonly referred to as mobility barriers (Caves and Porter, 1977). The higher the costs and penalties associated with switching strategic positions, the higher the mobility barriers are said to be.

Mobility barriers have some similarities to the inertial arguments proposed by the selection proponents. However, such barriers are typically seen by strategic management researchers as limiting, but not completely constraining strategic choice. For example, Porter (1991: 104) states:

Firms inherit positions that constrain and shape their choices, but do not determine them. They have considerable latitude in reconfiguring the value chain with which they compete, expanding or contracting their competitive scope, and influencing important dimensions of their industry environment.

Others note that such barriers may be particularly vulnerable during times of industry upheaval or disequilibrium (Fiegenbaum, Sudharshan and Thomas, 1990).

Random Transformation

Other theorists view organizations as loosely coupled systems or "garbage cans" where streams of problems, solutions, participants, and decision opportunities drift around and meet to produce change only by chance (Cohen, March, and Olsen, 1972; March and Olsen, 1976). This perspective sees organizations as ambiguous and complex settings, where changes occur in response to irrational, endogenous processes. Thus changes have little to do with the desires of management or environmental demands.
This view is strikingly different from both the selection and rational adaptation view in that it downplays the importance of the strategy/environment linkage. Under this perspective, one would expect no relationship between environmental change, organizational change, and organizational performance. Although change can occur quite frequently, it is at best random with respect to performance and survival value.

An important feature of this view, is that it is limited in its application to particular circumstances. Those advocating this view, note that it is applicable under conditions of "inconsistent and ill-defined preferences," "unclear technologies," and "fluid participation" (Cohen, March, and Olsen, 1972). These conditions are labeled as "organized anarchy." Although there is room for argument as to the extent that business organizations are characterized by organized anarchy, most theorists agree that these circumstances are more conspicuous in public and educational organizations. This is reinforced by the notion that this model was originated based on observations of decision making in colleges and universities (Scott, 1987). In general, such anarchy can be hypothesized to exist only in the face of extremely munificent and non-competitive environments. That is, where the strategy/environment linkage may in fact be quite weak. Given the fact that the banking industry
represents a competitive environment, with scarce resources, the random transformation model is not expected to be applicable.

Discussion

Of the various positions on organization adaptation described above, the population ecology and strategic management perspectives stand out in their opposition over basic assumptions. The population ecology model assumes that managers are helpless in the face of external and internal inertial forces. Inertial forces, combined with the liability of newness hypothesis, suggest that organizations will not often attempt changes to their core features, and that such changes will usually harm performance and increase the risk of failure. The strategic management perspective also assumes rationality, but suggests that managers have the discretion to change internal strategies and structures and the ability to effectively adapt to changing environmental demands. It is notable that both viewpoints stress the importance of achieving consistency between environmental demands and internal organizational states, and both assume a certain amount of rationality on the part of managers. Thus the main point of disagreement concerns the ability of managers to successfully initiate changes to the core features of their organizations.
Empirical Literature

Although the literature remains rather thin, a growing number of empirical studies have appeared in recent years that address the issues of strategic change. (See Table 1 for a summary) Perhaps the earliest research to examine changes in strategy was Chandler's (1962) historical study of Du Pont, General Motors, Standard Oil Company, and Sears Roebuck and Company. Chandler found that these firms changed their structure to correspond to changes in strategy, and noted that changes in strategy corresponded with changes in environmental opportunities, i.e., changes in technology, economic infrastructure, and demographics (p. 15). In other words, major strategic changes were accomplished in response to environmental change.

Another frequently cited study is Miles's (1982) in-depth examination of the adaptive behavior of the "Big Six" tobacco companies as they reacted to the threats posed by the smoking/cancer linkage and the 1970 ban on radio and TV ads for cigarettes. The general finding was that these companies were able to survive and remain viable through diversification efforts i.e., changes in strategy. However, Hannan and Freeman (1989) pointed out that Miles may have been misled by sample bias, since 37 of the 78 tobacco companies in existence in 1956 had ceased to exist by 1986.
Much of the strategic management research on strategic change has grown out of the literature dealing with strategic groups. As noted above, the main stream strategic management literature suggests that movement between strategic groups (firms following similar strategies) is difficult due to mobility barriers (Caves and Porter, 1977; Porter, 1980). Thus, much of this literature has been directed at measuring the extent of changes in group membership and the environmental circumstances under which such changes are likely to occur.

Oster (1982), used advertising to sales ratios to group firms from multiple industries into strategic groups. She found that movement between groups occurred relatively infrequently, and that change was impacted by the height of mobility barriers. Similarly, Mascarenhas (1989) found mobility rates to be relatively low among off-shore drilling firms, although change was more prevalent during periods of decline and between similar groups. One important point to make about these studies concerns the computation of mobility rates. Each study compares actual group changes to all possible changes, including the possibilities that each firm could change strategies in each year of the study. Because this is quite unlikely, the low mobility rates cited in these studies may be considered to be extremely conservative.
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<td>Group mobility is rare &amp; change is impacted by mobility barriers (degree of change)</td>
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<td>Multiple</td>
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<tr>
<td>Mascarenhas (1989)</td>
<td>Frequency of Change</td>
<td>Mobility rates were relatively low. Change was more prevalent during periods of decline and between similar groups</td>
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<td>Off-shore drilling</td>
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<td>Bauerschmidt &amp; Chrisman (1993)</td>
<td>Group mobility &amp; Survival</td>
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<td>Strategic group stability</td>
<td>Group structure underwent four major alterations, coinciding with major environmental jolts.</td>
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<td>Fiegenbaum &amp; Thomas (1990)</td>
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<td>Group structure underwent nine major shift, coinciding with a period of frequent regulatory changes.</td>
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<td>Insurance</td>
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<td>Bogner &amp; Pandian (1992)</td>
<td>Group stability vs. individual change</td>
<td>Strategic change often occurs independent of the activities of group members and breaks in group stability.</td>
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<td>Pharmaceuticals</td>
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<td><strong>Strategic Change Studies</strong></td>
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<tr>
<td>Smith &amp; Grimm (1987) Railroads</td>
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<td>Firms changing strategies outperformed those that failed to change. Change patterns and outcomes were related.</td>
</tr>
<tr>
<td>Zajac &amp; Shortell (1989) Hospitals</td>
<td>Patterns of change and performance</td>
<td>Prior strategy was a good predictor of change. No relation between change and performance.</td>
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<tr>
<td>Shortell, Morrison &amp; Friedman (1990) Hospitals</td>
<td>Various antecedents &amp; consequences of change</td>
<td>Approximately half the sample changed, but no significant performance improvements were observed. Prior performance, degree of change, and need for change were all found to impact implementation.</td>
</tr>
<tr>
<td>Goes (1989) Hospitals</td>
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</tr>
<tr>
<td>Fombrun &amp; Ginsberg (1990) Multiple</td>
<td>Change antecedents</td>
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<tr>
<td>Ginsberg &amp; Bucholtz (1990) HMO's</td>
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<td><strong>Population Ecology Studies</strong></td>
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<td>Singh, House, &amp; Tucker (1986)</td>
<td>Organizational change &amp; survival</td>
<td>Peripheral changes lowered the hazard of death, whereas core changes increased the hazard of death.</td>
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<td>Haveman (1992)</td>
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<td>Changes that build on existing competencies positively impact performance, but unrelated changes negatively impact performance. Certain related changes reduce the risk of failure.</td>
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<td>Savings &amp; Loans</td>
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<td><strong>Banking Studies</strong></td>
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<tr>
<td>Amel &amp; Rhoades (1988)</td>
<td>Strategic group mobility</td>
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<tr>
<td>Guarino (1991)</td>
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<td>A statistically significant number of banks changed strategies (40% - 80%) Small banks experienced a moderate increase in performance following the change.</td>
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<td>Reger, Duhaime, &amp; Stimpert (1992)</td>
<td>Impact of dereg. on risk taking and performance</td>
<td>Regulatory change tended to promote conservative behavior on the part of banks</td>
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<tr>
<td>Rediker &amp; Middleton (1992) Banking</td>
<td>Antecedents to change</td>
<td>Changes in strategy were negatively influenced by firm size and prior performance, and positively influenced by age of the top management team.</td>
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<td>Silverman &amp; Castaldi (1992) Banking</td>
<td>Antecedents to diversification</td>
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</tr>
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<td>Schendel &amp; Patton (1976) Multiple</td>
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<td>Severe decline in performance seemed to precipitate turnaround efforts. Successful turnarounds were characterized by strategic and operating changes.</td>
</tr>
<tr>
<td>Grinyer &amp; McKiernan (1990) Multiple</td>
<td>Antecedents to highly successful turnarounds</td>
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<tr>
<td>Hambrick &amp; D'Aveni (1988) Multiple</td>
<td>Antecedents to bankruptcy</td>
<td>Bankrupt firms experienced a long downward spiral. Strategic actions of failed firms tended to be either too much or too little.</td>
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<tr>
<td>D'Aveni (1989) Multiple</td>
<td>Antecedents to bankruptcy</td>
<td>Firms in decline tend to exhibit strategic paralysis.</td>
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<td>Authors/ Industry</td>
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<tr>
<td>Robbins &amp; Pearce (1992) Textiles</td>
<td>Retrenchment efforts and turnaround</td>
<td>Retrenchment is an integral part of turnaround. Strategic changes were only effective when combined with cost cutting and asset reduction.</td>
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</table>
Bauerschmidt and Chrisman (1993) examined strategic group mobility and organizational survival in the microcomputer industry in order to specifically test some of the assumptions underlying the population ecology and strategic management models. They found a relatively high degree of mobility, with over 44% of survivors changing strategic groups. They also presented evidence supporting the notion that changes in strategy are influenced (but not determined by) mobility barriers and strategic interdependence of group members.

A number of strategy researchers have examined patterns of strategic group stability and change over time by looking for breaks in the overall stability of an industry (Cool and Schendel, 1987; 1988; Fiegenbaum and Thomas, 1990; Bogner and Pandian, 1992). Cool and Schendel (1987, 1988) found that the strategic group structure within the pharmaceutical industry underwent four major alterations over a twenty year period, roughly coinciding with major environmental jolts. Using a similar methodology, Fiegenbaum and Thomas (1990) found the insurance industry more volatile, with nine major shifts in strategic variables and group structure recorded over a fifteen year period. The volatility of this industry was associated with a period of frequent regulatory changes. Bogner and Pandian (1992) extended this research stream by comparing the impact of changes in overall group structure.
with individual strategic changes. Their study suggests that strategic change often occurs independently of the activity of other group members and breaks in stable strategic time periods associated with environmental change. Although group membership may aid somewhat in predicting change, this research suggests the need to examine firm level factors in order to understand strategic change.

Other studies have sought to examine not only the incidence of strategic change, but firm level contextual factors impacting the change and change outcomes. Smith and Grimm (1987) found that 56% of the railroads in their sample changed strategies following deregulation in that industry and that those changing strategies were marginally more profitable than those not changing strategies. Moreover, there were important differences in performance associated with different types of strategic change, with those changing from an unfocused follower to innovators experiencing the greatest improvements. Zajac and Shortell (1989) examined 570 hospitals and also found that over half their sample changed strategies following a major environmental discontinuity, and that the prior strategy was a good predictor of whether a change would be attempted. However, unlike Smith and Grimm, they found that changes in strategy did not translate into performance
improvements, even when the changes were in the direction of a more preferable strategy for the changed environment.

In an extensive study, Shortell, Morrison, and Friedman (1990) used both quantitative and qualitative analysis to examine various aspects of strategic adaptation among 370 hospitals. Once again, approximately half the sample switched strategies, with no significant performance differences noted between those that changed and those that did not change. They attributed this to the notion that many of the analyzers and prospectors in their study were well suited to their environment and had no need for change. Among other things, Shortell et al. concluded that poor performance in the immediate past should always result in considering the need for fundamental strategic change in a rapidly changing environment, that change efforts were limited by both slack resources and managerial mindset, and that changes within the "strategic comfort zone," i.e., less radical changes, were easier to implement.

Goes (1989) examined strategic change in the entire population of California hospitals between 1976 (n=495) and 1987 (n=443). He recorded 203 changes out of 3611 change opportunities. As with Oster (1982) and Mascarenhas (1989), change opportunities were computed under the assumption that each firm in the study had the opportunity to change strategies in each year of the study, resulting in extremely conservative change rates. Goes found that
low relative performance (ROA), efficiency, and growth were significant predictors of whether or not organizations changed strategies, but that changes in these variables (regardless of the relative position) was unrelated to the propensity to change strategy. Interestingly, the study indicated that low performers that changed strategies did not significantly improve their performance, but that declining performers (regardless of their relative profitability) did marginally improve their performance. It was also found that strategic change tended to have a negative impact on efficiency but positively influenced growth rates for hospitals that had relatively low or declining growth rates prior to the change. Conversely, those with high or increasing growth rates prior to the change tended to experience low or declining growth following the change. Overall, the study provided limited support for the proposition that strategic change positively impacts firms experiencing low or declining performance and rather strongly supported the proposition that it negatively impacts firms experiencing high or increasing performance.

Fombrun and Ginsberg (1990) examined the influence of various "inhibitors" that create inertia and "inductors" that stimulate changes in strategic posture, or in their terms, corporate aggressiveness. They found that size had a significant negative relationship to change, and that
prior performance and sector volatility were related to change in a curvilinear fashion. That is, firms experiencing extreme levels of performance and volatility were less likely to change than those experiencing intermediate levels.

Ginsberg and Bucholtz (1990) examined the effects of various inertial forces (size, age, and structure), adaptive forces (slack, performance demands, competitive pressures, and environmental munificence), and institutional forces (chain affiliation, number of for-profit HMO's in market, and supportive state legislation) on the transformation of HMO's from nonprofit to for-profit orientations. They found that age, structure, slack, munificence, and institutional forces all impacted the length of time it took these organizations to convert to for-profit status following termination of federal assistance. Their model suggested the need for integrating the inertial and adaptive perspectives to understand organizational change.

Interestingly, the population ecology research to date has tended to focus on the states of the environment that give rise to particular adaptive forms (Scott, 1987). For example, these studies have sought to find evidence to support ecological arguments that environments characterized by certain levels of change (i.e., fine grained vs. coarse grained) will better support
organizations following certain strategies (i.e.,
genralists vs. specialists). Although inertia is an
underlying assumption behind these studies, population
ecologists have seldom directly tested this assumption.
Only two studies could be located that have directly
examined the issue of organizational change and survival
from the population ecology perspective. Singh, House, and
Tucker (1986) measured the impact of various changes among
voluntary service organizations on organizational mortality
and found mixed results. Their study suggests that
"peripheral" changes (e.g., changes in location and chief
executive) lowered the hazard of death and was consistent
with the adaptation perspective. "Core" changes (e.g.,
changes in goals, service areas, and structure) increased
the chance of death, which is consistent with the
ecological perspective. Since a change in strategy would
be considered a core change, this study is at odds with the
strategic management perspective. Haveman (1992) examined
the impact of changes in loan portfolios among 308
California thrifts on performance and mortality. The study
found evidence to suggest that changes during a time of
environmental upheaval and those that build on existing
competencies have a positive impact on performance. On the
other hand, unrelated changes (i.e., those that fail to
build on existing competencies) appear to have a negative
impact on performance. The relationship between change and
survival is less pronounced, but certain related changes were found to significantly reduce the risk of failure. This paper is interesting in that it argues from an ecological perspective the need to consider context and type of change when predicting change outcomes.

Several studies have specifically examined strategic change within the commercial banking industry. Amel and Rhoades (1988) examined strategic group stability among banks in sixteen urban markets between 1978 and 1984. The percentage of banks remaining in the same groups ranged from 29% to 100%, and averaged around 60%. The authors derived their groups by clustering 15 major portfolio and deposit variables derived from balance sheets, and used a six cluster solution. This study is particularly relevant because it uses similar variables and methods to derive strategic groups as proposed in this study, and provides evidence to suggest that a substantial number of banks changed strategies during the proposed time frame. Unfortunately, the authors provided no description of their groups or whether any patterns of change occurred.

Guarino (1991) examined the entire population of commercial banks from 1978 to 1987 to test certain propositions concerning the propensity of banks to change their strategies and the performance outcomes of such changes. The study showed that a statistically significant number of banks changed the category to which they
allocated the highest percentage of their earning assets (80% of small banks and approximately 40% of medium and large banks). Furthermore, these changes occurred in a non-random manner in all three size categories; i.e., most banks moved from commercial or retail lending to investing in securities. Medium and large banks displayed no performance differences. Some groups of small banks experienced performance increases, and these firms are the ones that tended to change in the same direction as the majority. This study also suggests that strategic change among commercial banks was rather common following deregulation, but uses a simple univariate measure of strategy and strategic change, which by the author's own admission is likely to significantly increase specification error.

Reger, Duhaime, and Stimpert (1992), examined the influence of rate and extent of geographic deregulation on various strategic choice variables and performance. The authors found that change in deregulation (pace of change) had a significantly negative relationship with risk taking behavior and a positive relationship with performance. Risk was positively related to performance, indicating that although incentives to engage in risky behavior were present, regulatory changes tend to provoke conservative behavior. Deregulation was found to have rather little impact on strategic choice variables. This study raises
some interesting questions regarding the impact of
deregulation on strategy, but fails to address the ability
of firms to change strategic direction.

Another recent study (Rediker and Middleton, 1992)
examined the relationships among top management team
characteristics, prior financial performance, firm size,
changes in the pattern and growth of strategy, and
subsequent financial performance in a sample of bank
holding companies. Changes in strategy were measured by
changes in loan portfolio diversification and loan
portfolio growth. The study found that changes in strategy
were negatively influenced by firm size, and age of the top
management team, and positively influenced by prior
performance of the firm.

Silverman and Castaldi (1992) examined the impact of a
number of contextual factors on the intentions of bank
CEO's to diversify into non-traditional business areas.
They found that perceived environmental changes such as
changes in competitive pressures and consumer preferences,
size, and variation in profitability, were positively
related to diversification intentions.

Because this study deals with environmental change,
and the influence of prior performance on change, another
relevant set of literature to consider is that dealing with
turnarounds. Schendel and Patton (1976) examined 36 pairs
of firms in decline, comparing those who managed a
turnaround to those that did not. They concluded that steadily poor performance was not enough to spur a major turnaround effort. Those firms that achieved turnarounds were prompted by precipitous drops in performance that generated a crisis. Furthermore, they suggested that the most effective responses were those that combined strategic changes with improvements in operating efficiency. Efforts that were tentative, or geared only toward operating improvements tended to be less effective.

Hofer (1988) built on this distinction between operating and strategic turnarounds, and conceptualized a link between the degree and type of downturn and the appropriate response. Specifically, he suggested that moderate downturns in operating performance may be corrected by operating turnarounds, whereas severe downturns may require strategic and operating changes. However, he also noted that if weak downturns were due to strategic considerations, then strategic turnarounds may be necessary.

Grinyer and McKiernan (1990) examined 25 organizations that were identified as having experienced major performance improvements relative to their industry rivals. Among other things, they proposed that change would be triggered by gaps between aspirations and realized performance, and that changes would occur in stages, beginning with operational and cost cutting programs, then
proceeding to changes in scope (which they define as strategic changes), and finally, changes in technology or fundamental changes such as divestment of previous core businesses and entry into unrelated businesses. A decline in performance was noted in the majority of changed firms, however, a group of control firms that did not change were also observed to experience similar performance downturns. Events triggering the actual change were considered to arise primarily from factors termed as "aspiration induced." These were mainly external events such as intervention by bankers, threat of takeover, or change of CEO (i.e., events that were theorized to widen the "gap" by increasing aspirations). Most firms exhibited the three categories of change, however, they typically occurred simultaneously rather than sequentially as proposed.

Hambrick and D'Aveni (1988) compared a sample of 57 large bankruptcies with a matched sample of surviving firms. The failed firms were found to have experienced an extended period of performance decline, accompanied by extremes in strategic activities. The bankrupt firms experienced a downward spiral, characterized by declines in slack and performance, that were followed by either inaction, or extreme levels of strategic changes. This study suggests a curvilinear relationship between strategic change and survival, with moderate levels of change associated with survival.
D'Aveni (1989) examined a matched set of 49 survivors and bankrupt firms. Among other things, he found that firms in decline tend to exhibit a greater degree of downsizing activity, but exhibited less strategic activity (i.e., they liquidated and divested, but on the whole did not change their lines of business). He concluded that firms in decline tend to exhibit strategic paralysis.

Robbins and Pearce (1992) examined the turnaround efforts of 38 firms in the textile industry. They found that retrenchment efforts, which include both cost cutting efforts and asset reduction, were positively related to subsequent performance, regardless of the reason for the decline. They also found that matching the severity of the decline with degree of retrenchment resulted in better outcomes. That is, successful firms tended to concentrate first on cost cutting efforts, and then moved to asset reduction only when the downturn became more severe. Another interesting finding of this study is that changes of a strategic nature were only effective when accompanied by retrenchment efforts.

Summary of Empirical Literature

Although the literature on strategic change remains sparse, several inferences can be drawn from the studies cited above. First, strategic change appears to be a relatively common occurrence. Studies that treat strategic change as an event have consistently found that
approximately half their sample changed strategies (40% to 60%). The only exceptions to this are those studies that conservatively compare change occurrence against all possible changes, including the possibility that each firm could change strategy in each year of the study. The consistency of these results, obtained across multiple industries and using different methodologies, suggests quite strongly that strategic change cannot be characterized as a rare event.

Second, the evidence indicates that strategic change is more common under conditions of environmental turbulence. Studies by Cool and Schendel (1987, 1988), Fiegenbaum and Thomas (1990), and Bogner and Pandian (1992) consistently found that breaks in strategic group stability coincided with major environmental discontinuities. In addition, Mascarenhas (1989) found that strategic change was more common during periods of economic decline. In fact, all of the single industry studies showing high levels of strategic change were performed during periods of economic decline and industry disequilibrium. This supports the strategic management perspective which argues that organizations should alter their strategies when environmental changes render existing strategies obsolete. It also suggests that the time frame chosen for this study is particularly appropriate for examining change, since the
decade of the 80's was an extremely turbulent period for the banking industry.

Because a large proportion of firms also fail to change strategies during periods of disequilibrium, it is apparent that firm level factors play an important role in determining strategic change. A growing number of authors have begun to explore these firm level factors. For example, there is limited evidence that certain contextual factors such as age, size, prior performance, and slack resources may influence the tendency to change (Fombrun and Ginsberg, 1990; Ginsberg and Bucholtz, 1990). The general notion is that larger and older firms tend to have greater levels of inertia, thus these factors tend to inhibit change. On the other hand, low or decreasing prior performance and slack resources represent the need and ability to change, respectively, and these factors tend to promote change. The influence of prior performance on change has been further explored in the turnaround literature, with general support found for the notion that the degree and type of downturn should be appropriately matched to the degree of change. However, there is some evidence to suggest that performance downturns may also result in a sort of strategic paralysis (D'Aveni, 1989). In addition, some authors have found evidence that characteristics of top management teams can influence the
tendency to change (Redeker and Middleton, 1992; Wiersema and Bantel, 1992).

Finally, the evidence regarding change outcomes can only be characterized as meager and contradictory. Less than one third (7) of the studies specifically examining strategic change, examined outcomes following strategic change. Of these, one found evidence supporting a positive relationship between strategic change and performance (Smith and Grimm, 1987), two found no evidence relating change to performance (Zajac and Shortell, 1989; Shortell, Morrison, and Friedman, 1990), and four studies found that specific firm level characteristics such as prior performance (Goes, 1989), type of change (Singh, House, and Tucker, 1986; Haveman, 1992), and size (Guarino, 1991; Rediker and Middleton, 1992) moderated the relationship between change and performance. The turnaround literature also suggests that choosing the appropriate degree of change is an important factor determining outcomes. Too much or too little change may both be detrimental (Hambrick and D'Aveni, 1988). Taken as a whole, this evidence suggests that the relationship between change and performance/survival may be moderated by certain firm level factors such as prior performance, size, and degree of change.
Summary and Conclusions

Although the strategic management and population ecology perspectives were presented in glaring contrast in this chapter, there has been a tendency toward convergence in recent years (Hambrick and Finkelstein, 1987; Boeker, 1989). A number of researchers within the strategic management camp have long recognized that managerial discretion is limited (Hambrick and Finkelstein, 1987) and that organizations may be slow to react to environmental changes (Quinn, 1980; Miller and Friesen, 1984). On the other hand, selection theorists have increasingly begun to acknowledge the possibility of organizational change (Hannan and Freeman, 1984; Singh, House, and Tucker, 1986; Haveman, 1992). This convergence is apparent in the empirical research, which has increasingly focused on firm level factors that may inhibit or encourage change and also influence change outcomes. Thus the debate has tended to move away from the question of whether organizations adapt and has moved towards understanding the situations in which adaptation is most likely to occur.
CHAPTER 4

THEORY AND HYPOTHESES

The literature reviewed in the previous chapter reveals a movement away from the basic question of whether organizations adapt, and toward understanding the circumstances under which adaptation is likely to occur. Factors such as organizational size, age, prior performance, slack resources, and degree of change have been hypothesized to influence change and moderate outcomes. A growing number of studies have explored the relationship between firm level factors and the propensity to change, but very few have examined the impact of these factors on performance or survival outcomes. In an attempt to address this gap in the literature, this chapter will introduce a basic conceptual model of strategic change and develop a number of testable hypotheses concerning the impact of firm level factors on change and change outcomes.

Conceptual Model

The literature suggests three broad categories of variables that are likely to influence strategic change; 1) adaptive forces, 2) inertial forces, and 3) degree of change. Adaptive forces are those factors thought to facilitate strategic change. Two firm level factors often
discussed in this regard are prior performance and slack resources. Inertial forces are those factors thought to hamper the initiation and implementation of strategic change. Two such factors often discussed in the literature are organizational size and age. Adaptive forces and inertial forces can be conceived of as directly influencing both initiation and consequences of strategic change. That is, the same adaptive forces that encourage strategic change, may for reasons explained later have a positive influence on change outcomes. Furthermore, adaptive and inertial forces may indirectly influence change outcomes by impacting the degree of change, which in turn can directly influence change outcomes. This model is demonstrated in Figure 3. The specific hypotheses to be tested are developed in the following sections.

Adaptive Forces

Although recognizing the existence of inertial forces, strategic management proponents stress the dominance of adaptive forces in driving and facilitating major organizational transformations (Ginsberg and Bucholtz, 1990). Pressure for change can come from internal changes (such as changes in managerial skills or aspirations) or the external environment (such as changes in competitive forces), but is often conceptualized as deriving from a gap between desired and actual (or projected) performance (Hofer and Schendel, 1978). Thus, while inertial forces
Figure 3. Conceptual Model
can inhibit change, "inductive forces" (Ginsberg, 1988; Ginsberg and Bucholtz, 1990) such as performance demands may create even more compelling reasons for change to occur. Put simply, major organizational change may become the best course of action when the cost of maintaining the status quo exceeds the cost of change (Haveman, 1992).

Another point often argued by strategy theorists is that organizations may opt to invest in resources that enhance their ability to adapt (Chakravarthy, 1982). The maintenance of slack resources, although sometimes argued to inhibit strategic change (Starbuck, Greve, and Hedberg, 1988), can be a major factor in implementing change once the organization becomes committed (Chakravarthy, 1982; Bourgeois, 1981). As noted by Bourgeois (1981), "slack is the resource that enables an organization both to adjust to gross shifts in the external environment with minimal trauma, and to experiment with new postures in relation that environment" (p. 31). The remainder of this section is devoted to developing a set of hypotheses concerning two factors that are thought to facilitate the change process; prior performance and slack resources.

**Prior Performance**

Pressure for strategic change can emanate from either internal or external changes, however performance is often argued to be a key variable in instigating change (Oster, 1982; Goes and Meyer, 1990). Theorists advocating a
quantum or revolutionary view of strategic change point out that decline, or even a crisis is necessary to prompt major strategic changes (Miller and Friesen, 1984; Starbuck, Greve, and Hedberg, 1988). Implicit in this view is that strategies are "sticky" (Oster, 1982), i.e., various inertial forces make strategic change difficult. Also, if organizations are tightly linked configurations as suggested by some theorists (Miller and Mintzberg, 1988), it may make sense to delay making major changes until the need for change becomes apparent. Low performance can indicate an erosion in "fit", and can thus act as an incentive for managers and other organizational participants to overcome inertial barriers to change.

Although there is some empirical evidence to support the above view (Oster, 1982; Goes and Meyer, 1990), others advocate different positions. For example, the "planning" approach to strategic management (Mintzberg, 1990; Goes, 1989), stresses the need for a proactive approach to strategic change. Arguing from a normative perspective, advocates of this approach emphasize the importance of responding to "weak signals" (Ansoff, 1975), so that change is accomplished before performance declines. Implicit in this position is the notion that strategies are rather facile in the hands of skillful managers (Goes, 1989). Others have argued that extremely low and extremely high
performance foster rigidity toward strategic change (Fombrun and Ginsberg, 1990).

The conceptual model in Figure 3 proposes that prior performance will be a significant antecedent for strategic change. Specifically, low or declining performance is argued to act as a catalyst for change. Thus, the following hypothesis is offered.

H1: Prior performance will be negatively related to degree of change.

An unstated assumption in much of the literature that has examined the outcome of strategic change is that environmental changes tend to equally impact firms within an industry. That is, following an environmental jolt, all organizations within the affected industry will need to change their strategies (Smith and Grimm, 1989; Shortell et al., 1990). However, the literature that examines strategic group dynamics suggests that environmental changes have a differential impact on firms within an industry due to differences in beginning strategies and/or individual firm resources and skills (Meyer, 1982; Bogner and Pandian, 1992; Shortell et al., 1990; Cool and Schendel, 1988; Bauerschmidt and Chrisman, 1993; Mascarenhas, 1989). Some firms will operate in niches that are more severely impacted, and/or will find their resources and skills less adequate than their competitors for dealing with revised environmental threats. These
"mismatched" firms will experience poor performance due to a general loss of effectiveness. Failure to change under these circumstances will be associated with a continuous decline in performance and increased risk of failure. On the other hand, some organizations are likely to find that their existing resources and strategic orientation are relatively well matched to the demands of their new environment (Shortell et al., 1990). Although some adjustments may be necessary, in all probability these firms will be able to maintain the status quo and experience few adverse effects, i.e., they have little need for major strategic changes. Thus, within a given industry, failure to change in response to environmental changes will have different outcomes, depending on the individual organizations need for change.

In addition, it can be argued that organizations changing their strategies are likely to experience different outcomes, based on their need for change. Haveman (1992) notes that change will improve performance and survival chances when the benefit from change (improved effectiveness) exceeds the loss of operating efficiency due to the change. Firms exhibiting poor performance due to a basic mismatch between organizational strategy and environment are likely to experience substantial benefits as they change to meet new environmental demands. That is, the greater the need for change, the greater the potential
benefits from undertaking the change. Also, it has been 
argued that the efficiency of engaging in organizational 
change increases when a clear threat is perceived; i.e., 
when need for change is high (Miller and Friesen, 1984). 
In the face of crisis, inertia tends to be reduced as 
organizational participants become more motivated to 
implement changes (Lawler, 1988; Tushman, Newman, and 
Nadler, 1988). Thus, organizations with low performance 
due to a mismatch between strategy and the environment are 
likely to benefit from changes in strategy because the 
potential gains are high and the loss in efficiency is 
reduced. In contrast, it has been argued that major 
organizational change is likely to be dysfunctional when 
there is little need for change (Tushman et al., 1988; 
Beer, 1988). Under these circumstances, the benefits 
accrue in smaller increments, and change efforts tend to be 
resisted more vigorously, resulting in higher overall 
costs.

The above arguments imply that it is important to 
control for performance in prior periods; i.e. need for 
change, when attempting to evaluate the relative impact of 
changes in strategy on short term performance and risk of 
failure. If need for change and change outcomes are 
related as argued above, and firms within a given industry 
undergoing discontinuous changes differ in their need for 
change, then divergent change outcomes can be expected. If
these differences in need for change are quite significant, then comparison of change outcomes between firms that change and fail to change strategies is likely to find no significant difference. The large within-group variation would overshadow the between-group variation; i.e., there would be no main effect. If this is the case, it offers one explanation for why many of the studies performed to date have found little relationship between strategic change and performance (Zajac and Shortell, 1989; Shortell, Morrison, and Friedman, 1990; Guarino, 1991).

The previous arguments suggests the following set of hypotheses:

H2: Strategic change and prior performance covary negatively with respect to subsequent performance and survival.

H2a: For organizations that change strategies, prior performance will be negatively related to subsequent performance and chances of survival.

H2b: For organizations that do not change strategies, prior performance will be positively related to subsequent performance and chances of survival.

Slack Resources

Organizational slack is another prominent construct suggested in the research on strategic change (Ginsberg and Bucholtz, 1990; Bourgeois, 1981). Defined broadly, slack resources consist of "a cushion of actual or potential
resources" (Bourgeois, 1981: 30). More recently, theorists have made the distinction between unabsorbed slack (excess liquid resources) and absorbed slack (excess costs) (Singh, 1986). In a related argument, Meyer (1982) noted that slack can be accumulated in different forms; e.g. financial slack, human resources and technology. This dissertation is concerned with the impact of excess or uncommitted financial resources on strategic change, thus unabsorbed financial slack will be used in this analysis.

Slack resources can have a positive impact on both initiating and implementing strategic change (Bourgeois, 1981). Cyert and March (1963) suggested that slack resources provide funds for experimentation and innovation. In terms of strategic position, excess funds can encourage managers to scan their relevant environments, and take a more proactive approach to experimenting with new products, technologies, and marketing approaches. Others (Starbuck, Greve, and Hedberg, 1988) argue that slack resources can inhibit change by dulling the organization's sensitivity to environmental circumstances and lowering the motivation to change. Thus, slack resources can be said to buffer the organization from its environment.

The model in Figure 3 suggests that slack resources will act as an adaptive rather than a buffering force. That is, slack resources are anticipated to encourage
change efforts. Therefore, the following hypothesis is offered.

H3: Slack resources will be positively related to degree of change.

Once an organization becomes committed to change, there seems to be general agreement that slack resources are likely to aid in implementation (Ginsberg and Bucholtz, 1990). Implementing a strategic change typically requires the accumulation of new resources and skills. To the extent that these resources are mobile; i.e., they can be bought and sold in factor markets (Barney, 1991), excess funds provide obvious benefits by allowing the firm to purchase the necessary resources. For example, a firm may draw down on its slack resources to acquire the personnel, technologies, and plant and equipment necessary to implement moves into new product lines or markets. Also, as pointed out by selection theorists, major organizational changes can be quite disruptive and result in loss of organizational efficiencies. Slack provides the organization with a cushion of resources that can be utilized during the reorganization process, thereby increasing the chances of success.

The logic above suggests a relationship between slack resources, strategic change, and change outcomes. For organizations choosing to change strategies, slack provides the resources to implement change, as well as a cushion to
protect the firm from shocks during the change period. For organizations that do not change strategies, slack may also have some short term performance and survival implications, however these resources are probably much more salient for firms undergoing change. Thus:

H4: Strategic change and slack resources covary positively with respect to subsequent performance and survival.

H4a: Organizational slack will be more positively related to performance for organizations that change strategies than for organizations that do not change strategies.

Inertial Forces

As noted above, selection theorists emphasize the role of inertial forces in constraining organizations from initiating and implementing changes of a strategic nature (Hannan and Freeman, 1977; 1984). High levels of inertia tend to retard responsiveness to environmental changes, and when change is attempted they tend to reduce the speed of change and the degree to which it can be planned and controlled. When entering into reorganization organizations give up the survival value of their previous structure and begin the process of building a new structure (Hannan and Freeman, 1984). It is during this transition phase that organizations are particularly inefficient and vulnerable to failure (Hannan and Freeman, 1989). Inertial forces represent a drag on the change process, thereby
increasing the duration of reorganization and lowering the chance of a successful outcome.

Selection theorists have pointed out that the strength of inertial forces are likely to vary among organizations of different ages and sizes (Hannan and Freeman, 1984). The remainder of this section discusses the effects of these two factors on strategic change and change outcomes.

**Organizational Age**

Standardized routines, organization specific skills, and webs of internal and external relationships essential for performance and organizational survival are generally established over time. The well known liability of newness hypothesis (Stinchcombe, 1965), argues that death rates decline with age as organizations develop these skills and relationships. As routines are worked out, skills are learned, and internal and external relationships established over time, the organization develops reliability of performance that reduces the probability of failure. However, increases in the attributes that lead to higher degrees of performance and increased survivability also lead to increasing levels of organizational inertia. Established routines become increasingly entrenched over time as organizational participants find it easier to continue existing habits than to invest in new routines and skills (Nelson and Winter, 1982). In addition, organizations tend to become enmeshed in exchange
relationships with customers and other organizations that, either through resource dependency or institutional processes, tend to constrain their actions (Ginsberg and Bucholtz, 1990). Thus, as organizations grow older inertial forces increase and major changes become more difficult to initiate. Thus, the following hypothesis is offered.

H5: Organizational age will be negatively related to degree of change.

Although the liability of newness hypothesis asserts that older organizations will outperform and outlast younger organizations, the stronger inertial forces associated with older organizations suggests that they will have more difficulty implementing changes of a strategic nature. Therefore, when attempting changes to the core aspects of the organization, younger organizations are likely to find that their greater flexibility places them at a relative advantage. That is, their resources and skills are less likely to have crystallized, and changes will be attempted more readily and implemented more quickly and with less disruption. Thus, for organizations changing strategies, it could be argued that organizational age will be negatively related to performance and survival. On the other hand, the inertial characteristics associated with older organizations are likely to have survival value when major changes are not undertaken. In keeping with the
liability of newness hypothesis, age is likely to be positively related to performance and survival for those firms that do not attempt major changes. Therefore, the following hypotheses are offered:

H6: Organizational age and strategic change covary negatively with respect to performance and survival. 
H6a: For organizations that change strategies, age will be negatively related to performance and survival. 
H6b: For organizations that do not change strategies, age will be positively related to performance and survival.

Organizational Size

Large organizations tend to be more complex and are characterized by greater degrees of formalization and standardization than small organizations (Fombrum and Ginsberg, 1990). As the organization grows larger, and the chain of command grows longer, strategic managers must delegate responsibility and rely on more complex and impersonal coordinating mechanisms. Thus, the organization becomes less amenable to the will of top managers (Hannan and Freeman, 1984). In effect, the organization takes on a life of its own that becomes difficult to alter. On the other hand, smaller organizations are more flexible and have quicker response times as they tend to be less formalized and more an extension of the will of their top managers (Hannan and Freeman, 1989). In other words,
inertial forces are thought to increase as organizational size increases. Therefore, the following hypothesis is offered.

H7: Organizational size will be negatively related to degree of change.

The above argument also suggests a simple linear relationship between organizational size and change outcomes; i.e., the larger the organization, the greater the inertia, and the less the chances of improving performance and enhancing survivability. That is, as inertial forces increase implementation becomes more difficult and positive outcomes become less likely. However, two factors may serve to alter this relationship. First, the ability to survive major organizational changes may depend partly on the degree of resources available to the firm (Hannan and Freeman, 1984). Although large organizations are more likely on average to experience increased response times and endure longer periods of reorganization, they typically have greater resources to weather such extended downturns. Small organizations typically have smaller margins for error (Hannan and Freeman, 1989) and are particularly vulnerable to environmental shocks during reorganization efforts. Second, large organizations tend to be more powerful and are more likely to alter their environments in ways that improve their chances of survival (Scott, 1987). This line
of reasoning has led some researchers to speculate that selection arguments are more appropriate for small organizations than large organizations (Scott, 1987; Aldrich, 1979; Astley and Van de Ven, 1983).

The above arguments have several important implications. First, organizational size is likely to be negatively related to performance outcomes for organizations that change strategies. Larger organizations must overcome greater obstacles, making the change effort more expensive to implement. On the other hand, it has been demonstrated that larger banks tend to be more profitable in general (Guarino, 1991), so one would expect size to be positively related to performance for firms that do not change strategies. The second important implication is that large organizations may stand a better chance of surviving strategic changes, despite the higher levels of inertia that must be overcome. This is likely to be particularly true in the banking environment, where the consequences of large bank failures have significant social implications, and bank closures are controlled by regulatory agencies. Thus the following hypotheses are offered.

H8: Strategic change and organizational size covary negatively with respect to subsequent performance.

H8a: For organizations that change strategies, size will be negatively related to performance.
H8b: For organizations that do not change strategies, size will be positively related to performance.

H9: Size will be positively related to survival, regardless of strategic change.

Degree of Change

Another crucial aspect to consider when examining the outcomes of strategic change is the type of change experienced. Population ecologists have made a distinction between core and peripheral changes, noting that selection arguments apply to changes in the core aspects of the organization (Hannan and Freeman, 1984; Singh, House, and Tucker, 1986). Core features include stated goals, forms of authority, core technology, and marketing strategy. These aspects of the organization are seen as providing a basis for distinguishing organizational forms, and are considered highly inert (Hannan and Freeman, 1984). In practice, however, most authors have focused on defining organizational forms in terms of domain, that is the customers served, products and services offered, and technologies used (Abell, 1980; Haveman, 1992). Changes along these dimensions represents a change in organizational form which, according to the selection argument, typically results in decreased performance and increased risk of failure.

Although recognizing that there are costs and risks associated with domain changes, strategic management
Theorists have often argued that these costs tend to vary depending on the degree or direction of the change. The costs of moving from one strategic position to another involves capital outlays and/or relative operating cost penalties commonly referred to as mobility barriers (Caves and Porter, 1977; McGee and Thomas, 1986). Typically, some strategic positions are easier to assume than others due to differences in the costs of entry; i.e., the height of mobility barriers (Caves and Porter, 1977). The lower the barriers, the less the cost, and the greater the likelihood of a successful entry. Harrigan (1985) argues that the relative height of mobility barriers separating strategic groups can be measured directly in a cluster analysis by the distance between clusters. Presumably, the closer the groups, the more similarities they share, and the lower the mobility barriers (Mascarenhas, 1989). Since changes to more similar groups are less costly, one may argue that these changes are less disruptive and most likely to improve survival chances.

On the other hand, it could be argued that changes of a more "quantum" nature may be more beneficial to performance than changes of an incremental nature. Organizations in groups that are relatively similar in nature are more prone to experience similar problems when faced with environmental changes. Incremental changes to these more similar groups may be easier to implement, but
may result in a similar set of problems. Thus, the organization experiences less risk, but also fewer benefits from the change. If this is true, it suggests a risk/return tradeoff when changing strategies. Changes of a large magnitude will be riskier, but may promise higher returns for organizations that are ill suited to their current environment. Conversely, small changes will be less risky, but result in smaller returns. Thus, the following is hypothesized:

H10: Degree of change will be negatively related to survival.

H11: Among survivors of change, degree of change will be positively related to performance.

Summary

This chapter developed a set of testable hypotheses, primarily concerning the relationship between performance demands, slack resources, size, and age on the strategic change-outcome linkage. The general notion, is that by taking these variables into account a clearer picture of the relationship between strategic change and performance/survival outcomes will emerge. In the next chapter, a set of research methods will be proposed to test these hypothesized relationships.
CHAPTER 5
RESEARCH DESIGN AND METHODOLOGY

A comparative longitudinal design was used to examine the hypotheses developed in the previous chapter. An eight year period, from 1980 to 1987 was chosen for the study. This time frame allowed for the investigation of strategic change and outcomes during the time immediately following the DIDMCA act of 1980.

Because loan portfolio strategies are likely to change relatively slowly, it was important to examine changes over as long a period as possible to allow them to materialize on the balance sheet. Thus, a decision was made to examine strategic change over a single four year time interval, 1982 to 1985, and assess performance over a three period prior to and following this interval (see Figure 4). Specifically, prior performance was assessed over a three year period from 1980 to 1982, and subsequent performance was assessed from 1985 to 1987. Failures were assessed over a two year period, 1986 and 1987. This design had the advantages of examining strategy over a relatively long period of time, and thus increased the chances of detecting change. As noted above, it also captured the banking industry at a time when strategic change was likely to occur.
Figure 4. Design of Study

Strategic Change

Prior Perf.

Post Perf.

80 81 82 83 84 85 86 87
Data Sources

Data were obtained through the Federal Reserve Call Report Data Base, which includes the population of insured banks for the United States. All insured banks are required by the Federal Reserve Board to submit semi-annual or quarterly call report data, depending on the size of the organization, that are included in this data set. The data set includes approximately 3,000 variables, including detailed balance sheet and income statements, as well as information concerning main office locations, branch locations, number of employees, and holding company affiliations.

This data set has several advantages over other data sets commonly used in strategic management research. First, the data set is subjected to validity checks and audits that verify the internal consistency and overall quality of the data. It is audited by representatives of the regulatory agencies through periodic bank examinations. Second, it is almost fully representative of the population of commercial banks in the United States. It is not subject to problems of self selection common in data sets such as PIMS. Third, it contains much useful supplementary information regarding such items as geographic locations and ownership affiliations. Finally, it allows the researcher to choose large random samples or, even use the entire population if desired. The most obvious drawback to
the database is that it includes information only at the level of the individual bank rather than the holding company. Thus, research questions must be limited to the level of analysis dealing with individual business units.

**Sample Selection**

A random sample of banks that were operating in 1980 was drawn from the population. Generally speaking, the larger the sample size, the better (Kerlinger, 1986); however, the minimum size needed depends on factors such as the level of significance desired, power of the test, population error variance, and effect size (Hinkle, Wiersma, and Jurs, 1988). The specific formula for determining sample size for a two sample case when the population variance is known is as follows:

\[
n = \frac{2\sigma^2 (Z_{\alpha} - Z_{\beta})^2}{(ES)^2}
\]

where:
- \(Z_{\alpha}\) = critical value of the test statistic in the sampling distribution associated with the null hypothesis at a given \(\alpha\).
- \(Z_{\beta}\) = standard score in the sampling distribution associated with the alternate hypothesis corresponding to \(Z_{\alpha}\) for a given power.
- \(\sigma^2\) = population error variance.
- \(ES\) = effect size
The population variance for one of the key variables in this study, ROA, can be derived from Goodman's (1988) study that also made use of the FDIC tapes. Level of significance and power are set at conventional rates of .05 and .80, respectively. Effect size is ultimately an arbitrary decision, but Cohen offers rough guidelines of small, medium, and large effect sizes. This study will use his guideline for detecting small effect sizes (\( .25 \times \sigma \)).

Using these guidelines:

\[
\begin{align*}
Z_a &= 1.645 \quad \text{(since } \alpha=.05) \\
Z_{\beta} &= -.842 \quad \text{(since } \beta=.20) \\
\sigma &= .01 \quad \text{(from previous study)} \\
ES &= .0025 \quad \text{(.25 x .01)}
\end{align*}
\]

These parameters suggest a sample size of approximately 400 banks will be sufficient to detect a difference of .0025 in ROA between banks that change and those that fail to change strategies. This, however, is based on the assumption that the sample will be approximately equally divided between those banks that change and those that fail to change. Since there was no way to tell a priori how the sample would be divided, and because failed banks will need to be eliminated for a portion of the analysis, an initial sample of 1,000 banks operating in 1980 was drawn.

Banks that disappeared from the data base prior to 1985 were eliminated from the sample, resulting in a sample
of 861. This sample was the one used for clustering, and for analyzing the change/failure relationships. Sixty one firms from this initial sample disappeared from the database in 1986 and 1987. These firms were eliminated in order to evaluate the change/performance relationships, resulting in a sample of 800. Of the 61 firms that disappeared, 27 were on the list of failed institutions maintained by the FDIC. The remaining banks were assumed to have merged with other financial institutions. The 27 failed banks in the final sample represent nearly 8% of the 348 banks that failed during that time period, and slightly more than 3% of the entire sample. This is consistent with the population failure rate of approximately 3% during this same period.

Operationalization of Variables

Measuring Strategy

The use of scope or product/market domain to define and classify organizational strategies has a great deal of precedence in the strategic management literature in general (e.g., Hatten, Schendel, and Cooper, 1978; Mascarenhas, 1989), and in the banking literature in particular (Guarino, 1991; Reger et al., 1992; Amel and Rhoades, 1988; Passmore, 1985). Also, population ecologists have tended to use scope variables to identify organizational forms (Hannan and Freeman, 1989; Haveman, 1992). In fact, Haveman (1992) argues that product,
market, and technology decisions are the defining
characteristics of an organizational form. Thus, although
other studies have used a broader array of components, the
use of scope is thought to represent an appropriate
measurement of strategy in this study.

To reflect the product/market choices made in the
commercial banking industry, a variety of financial ratios
were used. These ratios and their definitions are listed
in Table 2. Sixteen variables were chosen to reflect
asset/liability structures and geographic diversity. A key
product/market choice in the banking industry is the extent
to which competitors participate in various traditional
lending/investment activities. Six variables were chosen
to represent the depth of a bank's involvement in these
activities. Five variables represented the percentage of a
bank's lending/investment portfolio devoted to particular
categories of traditional activities: retail (RET),
commercial (COMM), agricultural (AG), and real estate (RE)
loans, and investments (INV). The sixth variable, loan
portfolio diversity (LPD) captured the degree to which a
bank chose to concentrate its traditional
lending/investment activities. LPD was measured as 1 -
Hirschman-Hirschman index of concentration (Rediker and
Middleton, 1992; Scherer, 1980) for the five portfolio
categories of retail loans, commercial loans, agricultural
### Table 2: Definition of Strategy Variables

<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Variable Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Assets - Loan Portfolio and Investments</strong></td>
<td></td>
</tr>
<tr>
<td>RET</td>
<td>Retail Loans Total Loans &amp; Investments</td>
</tr>
<tr>
<td>COMM</td>
<td>Commercial Loans Total Loans &amp; Investments</td>
</tr>
<tr>
<td>AG</td>
<td>Agricultural Loans Total Loans &amp; Investments</td>
</tr>
<tr>
<td>RE</td>
<td>Real Estate Loans Total Loans &amp; Investments</td>
</tr>
<tr>
<td>INV</td>
<td>Investments Total Loans &amp; Investments</td>
</tr>
<tr>
<td>LPD</td>
<td>(1 - \sum \text{Ret}^2 + \text{Comm}^2 + \text{Ag}^2 + \text{Re}^2 + \text{Inv}^2)</td>
</tr>
<tr>
<td><strong>Assets - Non-traditional products</strong></td>
<td></td>
</tr>
<tr>
<td>LEASE</td>
<td>Dummy variable where: 0 = No lease financing 1 = Lease financing</td>
</tr>
<tr>
<td>FEDFUND</td>
<td>Dummy variable where: 0 = No Fed Fund Loans 1 = Fed Fund Loans</td>
</tr>
<tr>
<td>CCARD</td>
<td>Dummy variable where: 0 = No credit card acct. 1 = Credit card acct.</td>
</tr>
<tr>
<td>FEES</td>
<td><strong>Service Charge Income</strong> Total Income</td>
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<tr>
<td><strong>Liabilities - Deposit Composition</strong></td>
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<tr>
<td>DEP</td>
<td><strong>Total Deposits</strong> Total Assets</td>
</tr>
<tr>
<td>LRGCD</td>
<td><strong>Time Deposits &gt; $100,000</strong> Total Deposit</td>
</tr>
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(table con'd.)
<table>
<thead>
<tr>
<th>Variable Name</th>
<th>Variable Definition</th>
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<tr>
<td>Geographic Diversity</td>
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<tr>
<td>DOMDEP</td>
<td>Domestic Deposits</td>
</tr>
<tr>
<td></td>
<td>Total Deposits</td>
</tr>
<tr>
<td>DOMLOAN</td>
<td>Domestic Loans</td>
</tr>
<tr>
<td></td>
<td>Total Loans</td>
</tr>
<tr>
<td>FORBR</td>
<td>Foreign Branches</td>
</tr>
<tr>
<td></td>
<td>Total Branches</td>
</tr>
<tr>
<td>TOTBR</td>
<td>Total number of branches</td>
</tr>
</tbody>
</table>

loans, real estate loans, and investments. The specific formula for calculating LPD is:

\[
LPD = 1 - \sum (RET^2 + COMM^2 + AG^2 + RE^2 + INV^2)
\]

Using five categories of assets, the LPD can range from 0, where the bank has concentrated all its resources in a single area, to .80, where the bank has evenly distributed its resources among all five areas. The LPD represents a gross measure of the scope of activities within the traditional lending/investment areas; i.e., the degree to which the bank chooses to focus its primary earning assets in a particular area. The individual category percentages measure the specific areas in which the bank chooses to focus.

To further capture product diversity, the extent to which the banks participated in less traditional product markets was assessed. These products included lease
financing, fed funds selling, credit cards, and fee based products. These activities are less commonly offered than the more traditional lending products and typically do not contribute a major portion of a bank's earnings. They do, however, provide an indication of the breadth of product offerings and the extent to which the bank is diversifying away from more traditional products and services. These variables were measured categorically, and were entered into the cluster analysis as dummy variables.

Two deposit variables were included: the ratio of total deposits to total assets (DEP) and the ratio of time deposits over $100,000 to total deposits (LRGCD). DEP represents the institutions dependence on total deposits, the traditional source of commercial bank funds. A low DEP ratio, would indicate the use of non-traditional funding sources and/or a greater reliance on equity capital. LRGCD measures the use of newer, more expensive, and relatively risky source of funds.

Four variables were used to measure geographic diversity. Domestic deposits to total deposits (DOMDEP) and domestic loans to total loans (DOMLOAN) highlight the extent of the bank's involvement in international activities. Foreign branches to total branches provides another measure of international activity, the extent to which the bank has a physical presence in foreign
countries. Total branches (TOTBR)\(^1\) represents a gross approximation of geographic breadth, however, it is recognized that this may also be a function of population density as well as location.

**Strategic Change**

Strategic change was measured in this study as a shift between strategic groups, with strategic groups represented by clusters. The clustering procedure was performed with a data set which combined strategic variables of the banks taken at two different periods; i.e., each bank was entered into the same data base twice. Firms that fell into different clusters at time one and time two were considered to have changed strategies. Smith and Grimm (1987) used a similar technique for assessing strategic changes in the railroad industry, and noted two advantages. First, by clustering the data from different time periods in one analysis, it can be assured that the underlying structure of each strategy remains the same for each time period. Using separate clusters in different time periods can lead to judgement errors as one must assess the equivalence of the clusters from time one to time two. Second, combining the data provides a strong test for measuring changes in strategy. For a firm to change clusters, it must bear a closer resemblance to other firms than itself at a

\(^1\)Other measures of geographic diversity such as number of states or counties in which the bank competes, were not available from the data set.
different time period. Thus, it could be argued that this technique is likely to identify only very conspicuous changes in strategy.

**Degree of Change**

Cluster analysis typically groups similar entities on the basis of euclidian distance measures (Hair et al., 1992). The general notion is to group entities such that the resulting clusters exhibit low within-group variance and high between-group variance. Harrigan (1985) argues that the between group variance or distance measures between groups of firms, can act as a surrogate for mobility barrier heights. That is, the greater the distance between any two given groups, the greater the mobility barrier heights, and the less the chance of switching group membership. Thus, in terms of this analysis, degree of change was assessed by measuring the relative distance a firm travels when switching clusters. The actual measurement used was the distance between cluster centroids provided in SAS output. Firms switching between groups in close proximity, as measured by distance between cluster centroids, were assumed to experience a less radical change than firms switching between groups whose cluster centroids were further apart. A failure to change strategic groups by a bank between time period one and two was coded as zero.
Prior Performance

Strategy theorists often note the distinction between two separate components of performance, effectiveness and efficiency (Hofer and Schendel, 1978; Drucker, 1954). Put very simply, effectiveness is doing the right thing, while efficiency is doing things right (Drucker, 1954). Hofer and Schendel (1978) equate effectiveness with the relationship between the organization and its environment; i.e., strategic performance, and efficiency with internal structure and operating activities; i.e., technical performance. Financial performance at any point in time is likely to be a function of each component; both are necessary but neither is sufficient for the long term survival of an organization.

Prior performance measures in this study represent an attempt to capture effectiveness or strategic performance. Poor performance is expected to indicate poor "fit" while good performance is expected to indicate good "fit." However, when using financial performance measures, the results may be confounded by efficiency considerations. For example, a firm may be very effective (i.e., have a good strategic fit) but be performing poorly due to inefficiencies. In this case, a change in strategy may have detrimental effects (Hofer, 1988). On the other hand, a firm may have a poor strategic fit following an environmental change, but continue to perform well in the
short run due to efficiency improvements. In both of these examples prior financial performance alone would be a poor indicator of "need for change".

This dissertation utilized a multifaceted approach for assessing prior performance that took into account each of the above mentioned aspects. This method answers the call by researchers for multidimensional measures of performance that capture aspects of both operational and financial performance (Venkatraman and Ramanujam, 1986). The measurement framework, demonstrated in Figure 5, includes three separate performance indicators intended to capture different aspects of performance: financial performance (ROA), efficiency, and effectiveness.

Also, because strategic change may be triggered by low or declining performance, it is important to capture each of these aspects when measuring prior performance. As noted by Goes (1989), changes in performance, regardless of relative standing to other firms, are likely to be important antecedents to change. Thus, prior financial performance and efficiency were assessed in two ways, as a change in performance over time and as average performance. Prior performance was measured over a three year period from 1980 to 1982. As noted below, effectiveness is itself a change measure, and therefore does not lend itself to being measured in a static manner. The following sections specify the actual measures used.
<table>
<thead>
<tr>
<th>Effectiveness</th>
<th>Change Measures</th>
<th>Absolute Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Avg. Change in Net Loans to Assets</td>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>Efficiency</td>
<td>Avg. Change in Efficiency Ratio</td>
<td>Average Efficiency Ratio</td>
</tr>
<tr>
<td>ROA</td>
<td>Avg. Change in ROA</td>
<td>Average ROA</td>
</tr>
</tbody>
</table>

Figure 5. Measurement of Prior Performance

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Effectiveness

One measure of effectiveness is that of sales growth (Hofer, 1988). However, since a major portion of a commercial bank's revenues are from interest income and is subject to uncontrollable changes in interest rates, a better measure may be that of overall loan portfolio growth. For most banks, the loan portfolio represents the vast majority of earning assets. Since loan portfolio growth can occur at the expense of loan quality, another important aspect of effectiveness is the overall riskiness associated with the loan portfolio. One way of controlling for this is to measure changes in net loans; i.e., gross loans minus the allowance for possible loan losses. Since loan loss provisions are regularly monitored by regulators for adequacy, this should provide an acceptable estimate of loan portfolio value. To control for size, net loans were expressed as a percentage of total assets, and changes were measured by subtracting the ratio at time 1 from that at time 2. These changes were measured over two time periods (1980-81, 1981-82) and averaged to arrive at a measure of prior effectiveness.

Efficiency

Efficiency was measured using the operating efficiency ratio (Chase Manhattan Bank, 1979):

\[
\frac{\text{Total Non-Interest Expenses}}{\text{Net Interest Margin} + \text{Total Non-Interest Income}}
\]
Where:

Total Non-Interest Expenses = Salaries and benefits + Net occupancy expense + furniture and equipment expense + provision for loan losses + other operating expenses.

Net Interest Margin = Total interest income minus total interest expense.

Total Non-Interest Income = Income from fiduciary activities + service charges on deposit accounts + other charges, commissions, and fees + other operating income.

This ratio measures how efficient managers are in allocating and controlling funds within their control such as salaries and benefits, occupancy expenses, furniture and equipment, and other operating expenses.

Financial Performance

ROA is, by far, the most commonly used measure of performance by researchers examining the banking industry (Reger et al., 1992; Goodman, 1988; Guarino, 1991; Passmore, 1985). In addition, it is the financial indicator most closely scrutinized by bank analysts and by industry participants (Reger et al., 1992). Therefore, it was used in this study to assess overall financial performance. The exact ratio used was Net Operating Earnings/Total Assets. Net operating earnings consist of earnings after taxes but before securities gains or losses. The use of this figure in the numerator eliminates windfall profits or unusual losses from the securities portfolio.
which may have been out of control of management (Chase Manhattan Bank, 1979).

Slack

Following Bourgeois (1981) slack was assessed using financial data. One commonly used measure of slack is the current ratio, which measures the firms ability to cover short-term obligations with liquid resources (Hambrick and D'Aveni, 1988). The banking equivalent, that was used in this study, is the liquidity ratio (Chase Manhattan Bank, 1979). This ratio is calculated as follows:

\[
\text{Cash + FFS - FFP + Invest. Portfolio - Pledged Securities} \over \text{Total Senior Liabilities - (Mort. Debt + Secured Dep.+ FFP)}
\]

Where:

FFS = Fed Funds Sold and Securities Purchased under Agreements to Resell.

FFP = Fed Funds Purchased and Securities Sold under Agreements to Repurchase.


Secured Deposits = Deposits of U.S. Government + Deposits of States and Political Subdivisions.

Pledged Securities = Same as Secured Deposits.

Total Senior Liabilities = Total Liabilities.
This ratio measures the percentage decline in funding sources which can be met by liquid assets, or the bank's cushion for meeting immediate resource needs.

Another commonly used measure of slack is the equity to debt ratio (Bourgeois, 1981; Singh, 1986; Hambrick and D'Aveni, 1988). Capital adequacy is an important measurement of a commercial banks ultimate ability to absorb losses and is monitored carefully by regulators. As such, the degree of available capital represents an important cache of unused resources that is available to buffer the firm during change. Capital adequacy was measured using the asset to capital ratio (total assets/total capital) a commonly utilized measure in the banking industry (Chase Manhattan Bank, 1979).

Age and Size

Age was measured as the number of years from the founding of a bank. Most measures of firm size tend to be highly correlated (Fombrun and Ginsberg, 1990), thus this study used total assets, a commonly used measure of size in the banking industry (Guarino, 1991; Goodman, 1988).

Change Outcomes

Two change outcomes are of interest in this study, performance and organizational failure. Performance outcomes were measured using the three indicators described above (net loan portfolio growth, the efficiency ratio, and ROA). For ROA and efficiency, the outcome of interest was
the difference between prior and post performance. A difference measure was thought to be more appropriate for these variables since it is more sensitive to the relationships being examined. Because loan portfolio growth is a change measure itself, average growth was used as the dependent variable.

Failure is the second dependent variable. The Federal Deposit Insurance Corporation (FDIC) Annual Report was consulted to identify failed institutions. Banks that were not closed or merged by orders of the FDIC, but disappeared from the data base during the time frame of the study were assumed to have voluntarily merged with another bank and were eliminated from the sample. Banks that disappeared from the sample between 1984 and 1987 and were closed or merged by orders of the FDIC will be coded as failed institutions.

Control Variables

One important variable to control for is holding company affiliation. Holding companies have the potential to significantly impact on a number of variables in this study, including change, type of change, and performance. That is, the parent may dictate change and direction of change, and may also affect change outcomes by providing resources that would not normally be available to the organization. This variable is available on the FDIC data tapes and was used as a control variable in the analysis.
Another factor to control for is general economic conditions which can obviously influence the dependent variables of concern. For example, during the early 1980's, banks in oil producing and agricultural states experienced more severe downturns than those in states with more diversified economies. Economic fluctuations were controlled by introducing unemployment rate statistics in the analysis for the state in which the bank is located.

Data Analysis

Data analysis proceeded in two stages. First, cluster analysis was used to identify banks that change strategies. Banks were coded to indicate change and degree of change. Second, multiple regression, hierarchical regression, and logistic regression analyses were used to test three sets of hypotheses: those examining change antecedents, those examining the strategic change/performance relationship, and those examining the strategic change/survival relationship.

Cluster Analysis

Cluster analysis is a family of multivariate technique designed to classify entities with respect to some predetermined criteria, so that the resulting clusters "exhibit high internal (within-cluster) homogeneity and high external (between-cluster) heterogeneity" (Hair et al., 1992: p. 4). In the present study, cluster analysis was used to separate firms into groups on the basis of
their scope of activities in the banking industry. The purpose was to generate relatively stable and meaningful strategic groups, and to detect changes in strategy by identifying changes in group membership. Cluster analysis has been used widely in the strategic group literature (Cool and Schendel, 1987; Fiegenbaum and Thomas, 1990), and more recently it has been utilized to detect changes in group membership (Smith and Grimm, 1987; Goes, 1989, Bauerschmidt and Chrisman, 1993).

The use of cluster analysis involves a number of choices that can lead to significantly different results, but for which there are no clear cut answers. Thus, use of the technique is perhaps as much an art as a science (Hair, et al., 1992). Some of the important decisions to be made concern dimension selection, scaling, the algorithm to be used, and the number of clusters formed (Harrigan, 1985; Hair et al., 1992).

The choice of dimensions to be measured and variables used represents an important theoretical decision. As argued above, scope represents an important dimension of an organization's competitive strategy, and the choice of variables in this study was designed to capture important elements of both breadth and depth of scope. In general, an attempt was made to follow Harrigan's (1985) advice to "select a few dimensions which seem theoretically appropriate for the greatest number of strategic groups"
(p. 61). Also, cluster analysis can be dramatically affected by the inclusion of undifferentiated variables (Hair et al., 1992); i.e., variables that do not differ significantly across the sample. It is important to examine the results and eliminate such undifferentiated variables to obtain well defined clusters.

The next question pertains to how inter-object similarity should be measured. Cluster analysis typically relies on distance measures to assess similarity. The most commonly used measure of distance is Euclidean distance, although other variants include the "city block" approach, or Mahalanobis distance (Hair et al., 1992). Generally speaking, when using measurements based on different scales it is necessary to convert the raw measures to Z scores prior to calculating distances to eliminate bias introduced by scale differences (Hair et al., 1992). However, as pointed out by Harrigan (1985), normalizing the data in this fashion causes the mean and scatter information to be lost when performing subsequent analysis of group homogeneity. One way to overcome this limitation is simply to use standardized information for clustering purposes and raw data for analyzing the clusters and testing for homogeneity (Harrigan, 1985). Also, since most techniques for assessing distance are sensitive to outliers (Hair et al., 1992), the strategy variables should be inspected for extreme observations.
A number of different clustering algorithms or procedures for grouping similar objects exist. The goal of each approach is to minimize the within cluster variation and maximize the between cluster variation, but differences in procedures can result in different outcomes. Most clustering algorithms fall into one of two categories: hierarchical or nonhierarchical. Hierarchical procedures involve the construction of tree-like structures that either start with each individual observation as a single cluster and work toward building a single cluster (agglomerative methods) or start with one large cluster containing all observations and split the observations until each is in a single cluster (divisive methods) (Hair et al., 1992). Five popular methods that fall under the hierarchical approach include single linkage, complete linkage, average linkage, Ward's method, and centroid.

Non-hierarchical procedures, frequently referred to as K-means clustering, do not involve the tree-like construction process. Instead, clustering centers are chosen and objects within a specified distance are included in the cluster. Three typical procedures include the sequential threshold approach, the parallel approach, and the optimizing approach.

Hierarchical procedures have been the most popular algorithm's in the past (Hair et al., 1992). They have the advantage of being fast and are thought to produce more
interpretable clusters, but they can be misleading because early groupings tend to persist throughout the analysis which can lead to undesirable results. Non-hierarchical methods have gained in popularity and have the advantage of allowing switching of cluster membership during analysis, thus avoiding groups characterized by "chaining". However, some authors argue that this feature represents a disadvantage (McKelvey, 1982). Following the lead of Bauerschmidt and Chrisman (1993) this study made use of the FASTCLUS procedure provided by SAS. FASTCLUS is a non-hierarchical method that uses the nearest centroid sorting method. In the FASTCLUS procedure, the user specifies the number of clusters. The procedure begins by selecting a set of cluster seeds, and observations are assigned to the nearest seed to form temporary clusters. The initial seeds are then replaced by the means of the temporary clusters, and the process is repeated until no further changes occur in the clusters (SAS/STAT Users' Guide, 1988). This approach offers the advantage of emphasizing distinctions among the strategic groups, rather than familial relationships (Bauerschmidt and Chrisman, 1993).

A prominent issue with clustering techniques concerns how to select the number of clusters. Harrigan (1985) made use of ratios comparing within to between group variance, while Hair et al. (1992) advocate looking for jumps in the distances between groups as they are combined as objective
guidelines to aid the analyst. Although a number of such
guidelines exist, the final solution must be based on a
combination of common sense, practical judgement, and
theoretical foundations (Hair et al., 1992). The approach
used for this study involved computing a number of cluster
solutions, then subjecting each solution to both subjective
and objective criteria. They were first examined for
interpretability, and then subjected to three sets of
diagnostic statistics, the ratio of within-group to
between-group variance (Harrigan, 1985), the Pseudo F
statistic, and the Cubic Clustering Criterion (Goes, 1989;
Milligan and Cooper, 1985).

Following this, the reliability of the groups were
assessed using a series of univariate and multivariate
statistical techniques, and by comparing them to strategic
types found elsewhere in the banking literature.
Statistical techniques utilized included univariate F-
tests, Bonferroni t-tests, and Discriminant analysis.

**Testing Change Antecedents**

The first set of hypotheses tested were those
suggesting a relationship between various antecedents and
degree of change. Specifically, it was suggested that
degree of change will be impacted by prior performance,
slack resources, and organizational age and size. These
hypotheses were tested using a single multiple regression
model as follows:
DCHNG = \( a + b_1 \text{ROA} + b_2 \text{ROACH} + b_3 \text{EFF} + b_4 \text{EFFCH} + b_5 \text{CHLNAS} + b_6 \text{LIQUID} + b_7 \text{ASCAP} + b_8 \text{LAGE} + b_9 \text{LASSET} + b_{10} \text{HOLDC} + e \)

where:

- **DCHNG** = Degree of change.
- **ROA** = Average return on assets.
- **ROACH** = Average change in return on assets.
- **EFF** = Average efficiency ratio.
- **EFFCH** = Average change in efficiency ratio.
- **CHLNAS** = Average change in loan to assets.
- **LIQUID** = Average liquidity ratio.
- **ASCAP** = Average assets to capital ratio.
- **LAGE** = Log of age\(^2\).
- **LASSET** = Log of assets.
- **HOLDC** = Holding company affiliation.

### Testing The Strategic Change Performance Relationship

Analysis of performance outcomes proceeded in several steps. First, hypotheses concerning the impact of prior performance, slack resources, organizational age, and size, were tested using separate multiple regression models for organizations that change and those that do not change. These regression models test the basic direction of the relationships. Second, moderated regression techniques were applied to formally test for an interaction effect.

\(^2\)Log transformations of age and assets were used as they were found to significantly improve the distribution of the data; i.e. log transformations resulted in an approximate normal distribution.
This indicated whether the hypothesized relationships were statistically different for firms that change and do not change strategies. Third, the hypothesis concerning the impact of degree of change on performance was assessed using multiple regression analysis.

Performance, Slack, Age, and Size

The hypotheses concerning the impact of prior performance, slack, age, and size were tested with the following models.

\[
\begin{align*}
\text{DROA} &= a + b_1\text{ROA} + b_2\text{ROACH} + b_3\text{LIQUID} + b_4\text{ASCAP} + b_5\text{LAGE} \\
& \quad + b_6\text{LASSET} + b_7\text{HOLDC} + b_8\text{UNEMP} + e \\
\text{DEFF} &= a + b_1\text{EFF} + b_2\text{EFFCH} + b_3\text{LIQUID} + b_4\text{ASCAP} + b_5\text{LAGE} \\
& \quad + b_6\text{LASSET} + b_7\text{HOLDC} + b_8\text{UNEMP} + e \\
\text{CHLNASAF} &= a + b_1\text{CHLNASBE} + b_2\text{LIQUID} + b_3\text{ASCAP} + b_4\text{LAGE} + \\
& \quad + b_5\text{LASSET} + b_6\text{HOLDC} + b_7\text{UNEMP} + e
\end{align*}
\]

where:

\begin{align*}
\text{DROA} &= \text{Change in average return on assets.} \\
\text{ROA} &= \text{Average return on assets, before.} \\
\text{ROACH} &= \text{Average change in return on assets, before.} \\
\text{LIQUID} &= \text{Average liquidity ratio.} \\
\text{ASCAP} &= \text{Average assets to capital ratio.} \\
\text{LAGE} &= \text{Log of age.} \\
\text{LASSET} &= \text{Log of assets.} \\
\text{HOLDC} &= \text{Holding company affiliation.} \\
\text{UNEMP} &= \text{State unemployment figures.} \\
\text{DEFF} &= \text{Change in average efficiency ratio.}
\end{align*}
EFF = Average efficiency ratio, before.
EFFCH = Average change in efficiency ratio, before.
CHLNASAF = Average change in loan to assets, after.
CHLNASBE = Average change in loan to assets, before.

Because a fundamental question being asked is whether the above variables moderate the relationship between change and performance, a more rigorous set of moderated regression equations were examined to test for interaction effects. The appropriate analytical technique to test for moderating relationships depends largely on the type of measurements employed (continuous or categorical) (Barron and Kenny, 1986). When the moderator and independent variable are both categorical, the appropriate technique is analysis of variance (Barron and Kenny, 1986). The technique often suggested when the moderator is a continuous variable and the independent variable dichotomous, is a dummy variable interactive model (Berry and Feldman, 1985). This involves running a series of regression equations and testing for the equality of slopes using the chow test or an equivalent hierarchical regression model (Pindyck and Rubinfeld, 1976; Cohen and Cohen, 1983; Pedhazur, 1982). Another option under these circumstances is to dichotomize the moderating variable and employ analysis of variance or t-tests, however this practice has been criticized vigorously (Pedhazur, 1982; Stone, 1988). When both the moderator and continuous
variables are continuous a multiplicative model is appropriate (Berry and Feldman, 1985; Baron and Kenny, 1986).

As noted, this study involves the examination of a series of continuous moderators (prior performance, slack, age, and size) and a dichotomous independent variable (change or no change). Therefore, a series of hierarchical regression models were utilized to test for an interaction effect (Cohen and Cohen, 1983; Stone, 1988; Pedhazur, 1982). More specifically, this involved running a main effects model and a full model containing an interactive term, and testing whether the model with the interactive term significantly increases the explained variance of the dependent variable. A difference in predictability between the full model and main effects model indicates significantly different slopes in the regression lines between firms that change and do not change strategies. The test statistic for determining significance is:

\[
F = \frac{(R_F^2 - R_M^2)/(k_F - k_M)}{(1 - R_F^2)/(N - k_F - 1)}
\]

where:

- \(R_F^2\) = The squared multiple correlation coefficient for the full model.
- \(R_M^2\) = The squared multiple correlation coefficient for the main effects model.
\( k_F \) = The number of independent variables in the full model.

\( k_M \) = The number of independent variables in the main effects model.

\( N \) = The total sample size.

The resulting F is distributed with \( k_F - k_M \) and \( N - k_F - 1 \) degrees of freedom. This test of significance was obtained from the SAS output, by using a stepwise model found in the REG procedure, and manipulating the data such that the interaction term was entered last. The basic question this technique answers is whether the use of separate regression coefficients for each group adds significantly to the explanation of the dependent variable, performance outcomes (Pedhazur, 1982). In other words, this test tells us if hypothesized moderators in fact have a different impact on performance between firms that change and do not change strategies.

Degree of Change

The next relationship to be considered is the impact of degree of change on performance outcomes. This hypothesis was tested by using regression models as follows:

\[
\begin{align*}
DROA & = a + b_1DCHNG + b_2HOLDC + b_3UNEMP + e \\
DEFF & = a + b_1DCHNG + b_2HOLDC + b_3UNEMP + e \\
CHLNAS & = a + b_1DCHNG + b_2HOLDC + b_3UNEMP + e
\end{align*}
\]
where:
DROA = Change in average ROA.
DCHNG = Degree of change.
HOLDC = Holding company affiliation.
UNEMP = State unemployment figures.
DEFF = Change in average efficiency ratio.
CHLNAS = Average change in loan to assets.

Testing the Strategic Change Survival Relationship

Estimating the impact of change on survival involves the prediction of a dichotomous dependent variable, survival vs. failure. When analyzing the occurrence of events such as this, two possible analytical techniques are available; discriminant analysis and logit analysis. Logit analysis has the advantage of requiring far fewer assumptions than discriminant analysis, and it is very similar to regression in terms of its statistical tests and diagnostics (Hair et al., 1992). Therefore, a logit model was fitted using the LOGISTIC procedure found in SAS. To test the hypotheses, concerning performance, slack, size, and age, a separate model was executed for firms that change and fail to change. The form of the logit model is as follows:

\[ P(\text{FAIL}) = a + b_1 \text{ROA} + b_2 \text{ROACH} + b_3 \text{EFF} + b_4 \text{EFFCH} + b_5 \text{CHLNAS} \]
\[ + b_6 \text{LIQUID} + b_7 \text{ASCAP} + b_8 \text{LAGE} + b_9 \text{LASSET} + b_{10} \text{HOLDC} \]
\[ + b_{11} \text{UNEMP} + e \]
where:

$P(\text{FAIL}) = \text{Probability of failure.}$

ROA = Average return on assets.

ROACH = Average change in return on assets.

EFF = Average efficiency ratio.

EFFCH = Average change in efficiency ratio.

CHLNAS = Average change in loan to assets.

LIQUID = Average liquidity ratio.

ASCAP = Average assets to capital ratio.

LAGE = Log of age.

LASSET = Log of assets.

HOLDC = Holding company affiliation.

UNEMP = State unemployment figures.

This model tests the basic direction of the hypothesized relationships. The statistical significance of the differences can be assessed by using a hierarchical procedure similar to that described above; i.e., calculating a main effects and full interactive model, and determining the statistical significance of adding the interactive term. Logistic regression has an overall measure of goodness of fit similar to $R^2$ squared, referred to as $-2\text{LL}$ (-2 Log Likelihood). This likelihood value can be used to compare fit between equations. Once again, the significance test is available in the SAS output, when using a stepwise model found in the LOGISTIC procedure.
The impact of degree of change on failure was estimated by a straightforward logit model as follows:

\[ P(\text{FAIL}) = a + b_1 \text{DCHNG} + b_2 \text{HOLDC} + b_3 \text{UNEMP} + e \]

where:

- \( P(\text{FAIL}) \) = Probability of failure.
- \( \text{DCHNG} \) = Degree of change.
- \( \text{HOLDC} \) = Holding company affiliation.
- \( \text{UNEMP} \) = State unemployment figures.

**Summary**

This chapter has attempted to lay out the design and methodology of this study. It has detailed the nature of the study, presented the data and measures used, and explained the data analyses used in testing the hypotheses proposed in the previous chapter.
CHAPTER 6  
RESULTS  

This chapter reports the result of the statistical tests in five major sections. First, the results of the classification efforts using cluster analysis is presented. The second section reports the results of tests examining change antecedents. The third section presents the results of those tests that examined the relationship between strategic change and performance outcomes. The fourth section describes the outcomes of the statistical tests examining the relationship between strategic change and survival. The final section reviews the results and summarizes the chapter.  

Cluster Analysis  

The main goal for the cluster analysis was to identify a set of stable and interpretable strategic groups and to detect changes in strategy by identifying changes in group membership. The following section details the procedures and outcomes.  

Clustering Procedure  

As noted, the FASTCLUS procedure was used to perform the cluster analysis. The strategy variables from 1982 and 1985 were merged into the same data set as separate
observations, resulting in 1,722 observations available for clustering. The variables were standardized prior to the analysis.

Initial attempts at clustering yielded unexpected results. Regardless of the number of clusters derived, approximately 98% of the sample remained grouped in a single cluster. Upon close examination of the strategy variables, it was determined that the cause for this was the inclusion of what Hair et al. (1992) refer to as undifferentiated variables; i.e., those that differ little across the sample. Four of the variables included in the original analysis fell into this category. For example:

1. DomLoan - Only 10 instances of foreign loans reported out of a possible 1722 occurrences.
2. DomDep - Eight firms reported foreign deposits.
3. ForBr - Eleven firms reported foreign branches.
4. FedFund - All but eighty two firms sold fed funds.

The inclusion of such variables can obviously have a dramatic and undesirable impact on the results of a cluster analysis. To obtain well defined and interpretable clusters, Hair et al. recommend deleting undifferentiated variables. The deletion of such variables is also endorsed by Harrigan (1985) who argues for the use of only those

---

3Prior to 1984 information on many foreign transactions was unavailable, except for the largest banks. It is likely that a larger number of banks were involved in foreign transactions than is indicated by these variables.
variables with the greatest discriminatory power. Therefore, the four variables above were removed from the analysis, resulting in the use of twelve strategic variables for the cluster analysis. Means and standard deviations for these variables are provided in Table 3.

Table 3. Means and Standard Deviations of all Strategy Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>1982 Mean</th>
<th>1982 Std.</th>
<th>1985 Mean</th>
<th>1985 Std.</th>
<th>Combined Mean</th>
<th>Combined Std.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Loan portfolio diversity (LPD)</td>
<td>.6302</td>
<td>.0980</td>
<td>.6742</td>
<td>.0832</td>
<td>.6522</td>
<td>.0935</td>
</tr>
<tr>
<td>% Retail Loans (RET)</td>
<td>.2232</td>
<td>.1302</td>
<td>.1482</td>
<td>.0934</td>
<td>.1857</td>
<td>.1193</td>
</tr>
<tr>
<td>% Comm. Loans (COMM)</td>
<td>.2236</td>
<td>.1413</td>
<td>.1601</td>
<td>.1116</td>
<td>.1918</td>
<td>.1312</td>
</tr>
<tr>
<td>% Agricultural Loans (AG)</td>
<td>.1629</td>
<td>.2150</td>
<td>.0864</td>
<td>.1203</td>
<td>.1246</td>
<td>.1783</td>
</tr>
<tr>
<td>% Real Estate Loans (RE)</td>
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<td>.1743</td>
<td>.2435</td>
<td>.1318</td>
<td>.2774</td>
<td>.1582</td>
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<tr>
<td>% Investments (INV)</td>
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<td>.1637</td>
<td>.3618</td>
<td>.1659</td>
<td>.2203</td>
<td>.2172</td>
</tr>
<tr>
<td>Lease Financing (LEASE)</td>
<td>.1347</td>
<td>.3416</td>
<td>.1951</td>
<td>.3965</td>
<td>.1649</td>
<td>.3712</td>
</tr>
<tr>
<td>Credit Card Accts. (CCARD)</td>
<td>.3182</td>
<td>.4661</td>
<td>.3647</td>
<td>.4816</td>
<td>.3415</td>
<td>.4743</td>
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<td>% Fee Income (FEES)</td>
<td>.0416</td>
<td>.0312</td>
<td>.0555</td>
<td>.0349</td>
<td>.0485</td>
<td>.0338</td>
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<tr>
<td>Deposits/Assets (DEP)</td>
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<td>88.71</td>
<td>4.436</td>
<td>88.31</td>
<td>4.447</td>
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<tr>
<td>% Time Deposits &gt; $100M (LRGCD)</td>
<td>11.42</td>
<td>10.146</td>
<td>11.26</td>
<td>10.018</td>
<td>11.34</td>
<td>10.080</td>
</tr>
<tr>
<td>Total Branches (TOTBR)</td>
<td>3.49</td>
<td>10.938</td>
<td>4.12</td>
<td>13.494</td>
<td>3.80</td>
<td>12.283</td>
</tr>
</tbody>
</table>

N=861   N=861   N=1722

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Number of Clusters

Although a number of guidelines exist for determining the "optimum" number of clusters, there is no truly objective standard (Harrigan, 1985; Hair et al., 1992). Milligan and Cooper (1985) investigated thirty stopping rules for hierarchical cluster analysis using Monte Carlo simulations and found that most did a poor job of identifying a known cluster structure. Thus, most researchers agree that the best approach involves reliance on judgement, theoretical expectations, and a few well chosen diagnostic procedures (Goes, 1989; Hair et al., 1992).

Based on previous empirical work using similar clustering procedures (Dess and Davis, 1984; Goes, 1989; Smith and Grimm, 1987; Bauerschmidt and Chrisman, 1993), from theoretical generic strategies (Porter, 1980; Miles and Snow, 1978) and from proposed banking typologies (Goodman, 1988) the a priori expectation was for three to seven strategic configurations to emerge from the data. Also, from a practical standpoint, less than three configurations would probably not be very meaningful and more than seven would become cumbersome. Therefore, a decision was made to start with a series of five k-means runs, analyzing from three to seven clusters.

These initial clusters were first examined from the perspective of their interpretability and overall meaning-
fullness. In general, it was found that the interpretability improved as the clusters increased from three to five. That is, each successive cluster seemed to be distinctive from the other clusters along one or more dimensions. However, when the clusters increased beyond five, they seemed to become less distinct and more difficult to interpret. In other words, partitioning the data set beyond five clusters did not seem to be meaningful, and in fact made interpretation more awkward.

Following this initial inspection of the clusters, three sets of diagnostic statistics were examined. The first was the ratio of within-group variance to between-group variance suggested by Harrigan (1985). Low values of this statistic are preferred, since this indicates a greater degree of explained variance (variance between clusters) than unexplained variance (variance within clusters). Figure 6 presents a graph of this statistic for the five cluster solutions. Because this statistic will always improve as the number of clusters increases, the key to interpretation is to examine the degree of change (Harrigan, 1985). As can be seen, moving from three to four and four to five clusters results in significant improvements, but the incremental improvements are much less when moving to six and seven clusters. This would seem to confirm the initial subjective judgement that a five cluster solution is appropriate.
Figure 6. Within/Between Ratio

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Two additional diagnostic tools that are generated by the FASTCLUS procedure are the Pseudo F statistic and the Cubic Clustering Criterion (Goes, 1989). Milligan and Cooper (1985) found these two statistics to be among the most reliable in detecting the optimum cluster solution. The Pseudo F statistic is similar to Fisher's F, in that higher values indicate a better cluster solution. Figure 7 presents a graph of this statistic. Once again, the five cluster solution is confirmed.

The final diagnostic tool used is the Cubic Clustering Criterion. Higher values are preferred, and Figure 8 reveals that the five and seven cluster solutions stand out as superior. Taken as a whole, however, the subjective interpretation, combined with the diagnostic statistics, points rather convincingly to a five cluster solution as being the most appropriate.

Results of the Five-Cluster Solution

Table 4 presents a summary of the five cluster solution, including the unstandardized cluster means and standard deviations for each strategy variable, and univariate F ratios (ANOVA's). Cluster distances are provided in Table 5. In general the five cluster solution appeared to do an adequate job of separating the groups along the strategic variables. The univariate F tests revealed highly significant differences between the cluster means across the five clusters for each strategy variable.
Figure 7. Pseudo-F Statistic
Figure 8. Cubic Clustering Criterion
Table 4. Summary of Cluster Analysis Results: Cluster Frequencies, Means, Standard Deviations, and F Statistics

<table>
<thead>
<tr>
<th></th>
<th>Cluster 1 (n=515)</th>
<th>Cluster 2 (n=157)</th>
<th>Cluster 3 (n=54)</th>
<th>Cluster 4 (n=564)</th>
<th>Cluster 5 (n=432)</th>
<th>F Ratio</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>LPD</td>
<td>.6518</td>
<td>.5752</td>
<td>.7109</td>
<td>.6495</td>
<td>.6769</td>
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<tr>
<td>Std. Dev.</td>
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<td>.1205</td>
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<td>4</td>
<td>2</td>
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<tr>
<td>Ret</td>
<td>.1173</td>
<td>.1251</td>
<td>.1957</td>
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<td>4</td>
<td>3</td>
<td>1</td>
<td>2</td>
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<tr>
<td>Comm</td>
<td>.1078</td>
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<td>1</td>
<td>3</td>
<td></td>
<td></td>
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<td>Inv</td>
<td>.4746</td>
<td>.0273</td>
<td>.3148</td>
<td>.0827</td>
<td>.1554</td>
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<td>.0001</td>
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<td>.1239</td>
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<td>2</td>
<td>4</td>
<td>3</td>
<td></td>
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<td>.1019</td>
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<td>.0887</td>
<td>.2477</td>
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<td>.2845</td>
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<td>1</td>
<td>5</td>
<td>2</td>
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<td></td>
</tr>
</tbody>
</table>

(table con'd.)
Cluster 1 (n=515) | Cluster 2 (n=157) | Cluster 3 (n=54) | Cluster 4 (n=564) | Cluster 5 (n=432) | F Ratio | p Value
--- | --- | --- | --- | --- | --- | ---
CCard | .2058 | .0510 | .9260 | .3440 | .5324 | F=73.98
Std. Dev. | .4047 | .2206 | .2643 | .4754 | .4995 | p=.0001
rank | 4 | 5 | 1 | 3 | 2 |
Fees | .0474 | .0200 | .0639 | .0424 | .0661 | F=75.46
Std. Dev. | .0319 | .0194 | .0284 | .0280 | .0376 | p=.0001
rank | 3 | 5 | 2 | 4 | 1 |
Dep | 88.36 | 88.51 | 77.86 | 89.37 | 88.12 | F=102.23
Std. Dev. | 3.712 | 3.538 | 8.448 | 3.055 | 4.674 | p=.0001
rank | 3 | 2 | 5 | 1 | 4 |
LrgCd | 7.770 | 7.802 | 11.02 | 7.686 | 21.70 | F=238.51
Std. Dev. | 6.601 | 7.321 | 8.114 | 5.798 | 11.72 | p=.0001
rank | 4 | 3 | 2 | 5 | 1 |
TotBr | 2.067 | 1.184 | 49.24 | 2.651 | 2.656 | F=343.53
Std. Dev. | 1.769 | .4779 | 50.21 | 3.081 | 2.909 | p=.0001
rank | 4 | 5 | 1 | 3 | 2 |

Cluster 1 - Focused Investors
Cluster 2 - Focused Agricultural Lenders
Cluster 3 - Generalists
Cluster 4 - Focused Retailers
Cluster 5 - Generalist Wholesaler
To investigate these differences in more detail the individual means were subjected to multiple comparisons using the Bonferroni t-test. Although other authors have used pairwise comparisons for this purpose (Harrigan, 1985; Smith and Grimm, 1987), the Bonferroni statistic was felt to be more appropriate since it does an effective job of controlling for experimentwise error rate (SAS/STAT Users Guide, 1988). The results (Table 6) revealed that the clusters are statistically different from each other along most of the strategic dimensions used. It is notable that DEP, LRGCD, and TOTBR, seemed to do a poorer job than the other variables, as approximately half the comparisons were insignificant for each of these variables. Overall, the five cluster solution explained 32.9% of the variance in the strategy variables.

A multivariate technique that can be used for assessing the overall validity of the cluster solution is multiple discriminant analysis (DeCastro, Chrisman,
Table 6. Bonferroni T-tests of the Differences in Cluster Means for the Strategy Variables Used in the Cluster Analysis

<table>
<thead>
<tr>
<th>Loan Portfolio Diversity</th>
<th>Cluster1</th>
<th>Cluster2</th>
<th>Cluster3</th>
<th>Cluster4</th>
<th>Cluster5</th>
</tr>
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<tbody>
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<tr>
<td>Cluster2</td>
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<tr>
<td>Cluster3</td>
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</tr>
<tr>
<td>Cluster4</td>
<td>n.s</td>
<td>*</td>
<td>*</td>
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<tr>
<td>Cluster5</td>
<td>*</td>
<td>*</td>
<td>n.s</td>
<td>*</td>
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</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>% Retail Loans</th>
<th>Cluster1</th>
<th>Cluster2</th>
<th>Cluster3</th>
<th>Cluster4</th>
<th>Cluster5</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
<tr>
<td>Cluster2</td>
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<tr>
<td>Cluster4</td>
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</tr>
<tr>
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<td>*</td>
<td>n.s</td>
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<tr>
<td>Cluster2</td>
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<tr>
<td>Cluster3</td>
<td>*</td>
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<tr>
<td>Cluster4</td>
<td>*</td>
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* - significant difference between groups at .05 level
n.s. - no significant difference between groups

(table con'd.)
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<tr>
<th>% Agricultural Loans</th>
<th>Cluster1</th>
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<th>Cluster3</th>
<th>Cluster4</th>
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<tr>
<td>Cluster5</td>
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<td>*</td>
<td>n.s</td>
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* - significant difference between groups at .05 level
n.s. - no significant difference between groups

(table con'd.)
### Lease Financing

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### Credit Card Accounts

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### % Fee Income

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</table>

* - significant difference between groups at .05 level
n.s. - no significant difference between groups

(table con'd.)
<table>
<thead>
<tr>
<th></th>
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<td><strong>Deposits/Assets</strong></td>
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<td><strong>% Time Deposits &gt; $100,000</strong></td>
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<td>Cluster3</td>
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<td>*</td>
<td>n.s</td>
<td>--</td>
</tr>
</tbody>
</table>

* - significant difference between groups at .05 level  
n.s. - no significant difference between groups
Schweiger, and Sandberg, 1994). Discriminant analysis is an appropriate statistical technique for testing the hypothesis that group means of multiple groups are equal (Hair et al., 1992). The results of a canonical discriminant analysis using the SAS DISC procedure are shown in Table 7. A sample of 1290 banks, approximately 75% of the total sample, was used to calculate the discriminant functions. The number of discriminant functions necessary for a five group discriminant analysis is four. Each discriminant function is a linear composite that attempts to explain the variations or differences in the dependent categorical variables (Hair et al., 1992). The highly significant F values associated with each discriminant function in Table 7 allow us to reject the null hypothesis that the canonical correlations equal zero. In other words, each linear combination of strategy variables explains a significant amount of the variance between the clusters. In addition, the discriminant function accurately classified 91.4% of the 432 firms from the holdout sample into the correct cluster. Thus, taken as a whole, the strategy variables do a good job of explaining the variance in the clusters, confirming the adequacy of the five cluster solution.

In summary, the statistical tests applied above all point to an adequate cluster solution. The strategy variables exhibit significant differences across the five
Table 7. Results of Multiple Discriminant Analysis

<table>
<thead>
<tr>
<th>Function</th>
<th>Eigenvalue</th>
<th>Canonical Correlation</th>
<th>Approximate F</th>
<th>Pr &gt; F</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2.296</td>
<td>.8346</td>
<td>254.59</td>
<td>.0001</td>
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<tr>
<td>2</td>
<td>2.046</td>
<td>.8196</td>
<td>242.04</td>
<td>.0001</td>
</tr>
<tr>
<td>3</td>
<td>1.280</td>
<td>.7493</td>
<td>214.99</td>
<td>.0001</td>
</tr>
<tr>
<td>4</td>
<td>.994</td>
<td>.7060</td>
<td>212.42</td>
<td>.0001</td>
</tr>
</tbody>
</table>

clusters when tested with both univariate and multivariate techniques. Thus the cluster analysis was apparently successful at separating the groups in a manner that maximized between group and minimized within group variance.

Interpreting the Clusters

Cluster interpretation involves an examination of the nature of the clusters in order to assign names or labels (Hair et al., 1992). Ideally, the clusters should not only differ from each other along the strategic dimensions, but should exhibit patterns of differences that make sense from a judgmental and/or theoretical perspective. The interpretation process is typically accomplished by inspecting the rank order and absolute values of the unstandardized cluster means used in the analysis (Harrigan, 1985; Goes, 1989, Smith and Grimm, 1987). This information is found in Table 4. To further aid in the analysis, the standardized cluster means for each variable were plotted by cluster in Figure 9 (standardized to a mean of zero and a standard deviation of one). This visual
Figure 9. Plot of Standardized Cluster Means
image represents an efficient means of communicating the strategic patterns for each cluster simultaneously.

A description of each group is as follows:

Cluster 1 - Focused Security Investors

Banks in this cluster can be characterized as being rather narrowly focused security investors. Security investments on average make up nearly half of the lending/investment portfolio (47.5%), which is considerably higher than that found in the other clusters. An inspection of Figure 9 reveals that these banks rank below average on all the remaining strategy variables, indicating a relatively low reliance on traditional lending areas, as well as a low level of dependency on non-traditional products and funding sources. Also, with only two branches on average, their level of geographic diversity is quite low. Because investment securities are typically limited to those issued by the U.S. Treasury, and other federal, state and local government agencies, this strategy is quite conservative. In his examination of success factors in the banking industry from 1977 to 1984, Goodman (1988) found a number of banks following this strategy. Interestingly, since it entails relatively low risk, this strategy was

---

The term focused is used here to indicate a firm with a relatively narrow scope. Focus was felt to appropriately capture the notion of scope for the banking industry since most banks participate in a wide variety of lending and investment activities, but may emphasize one area over the other.
found to be the most consistently profitable in each year and under every environmental circumstance examined. Guarino (1991) also found a number of banks following this strategy, with a move toward security investments representing the most common strategic change between 1977 and 1987. Thus, such a strategy has precedence in the literature. Also, given the results of these studies, it is not surprising that this cluster is one of the largest.

Cluster 2 - Focused Agricultural Lenders

The banks in cluster 2 stand out for their strong emphasis on agricultural lending. On average, these banks invested approximately 57% of their investment/loan portfolio in agricultural loans. By comparison, the remainder of the sample averaged less than 8% of their total portfolio in agricultural loans. As with the cluster 1 members, these banks were rather highly concentrated in a single segment, and ranked below average in all other strategic categories. Thus they rely relatively little on other lending activities, and are highly traditional when it comes to new products and funding sources. These banks are geographically concentrated, and not surprisingly, are the smallest in size (Average assets of $21.9 million).

Once again, Goodman (1988) found banks following this strategy in his sample, although he concluded that the more successful ones moved away from this strategy following a decline in the agricultural economy in 1979. This is
consistent with the relatively small membership found in this cluster.

Cluster 3 - Generalists

Cluster 3 banks stand out primarily for assuming a broad based, diversified strategy, or what organization theorists refer to as a generalist strategy (Aldrich, 1979; Zammuto and Cameron, 1985). The LPD index of .71 (maximum is .80)\(^5\) indicates an equal balance within the lending/investment portfolio. Although no single portfolio item stands out, these banks are involved in retail and commercial lending, and investments to a greater extent than the average banks in other clusters. The only lending/investment category that they are not heavily involved in is agricultural loans. These banks also invest quite heavily in non-traditional products and funding sources. They are ranked first in the areas of leasing and credit cards, with 81.5% and 92.6% of firms in the cluster offering these services, respectively. The relatively low deposit to asset ratio, suggests a reliance on alternative funding sources. One of the most striking features of this cluster, is its high level of geographic diversity. On

\(^5\)Loan portfolio diversity, or LPD, is calculated as follows:

\[ \text{LPD} = 1 - \sum \text{RET}^2 + \text{COMM}^2 + \text{AG}^2 + \text{RE}^2 + \text{INV}^2. \]

In an equally balanced portfolio, each portfolio category equals .20, resulting in an LPD of .80.
average, the banks following this strategy have over 49 branches.

Generalists appear to fit the description of relatively large regional banks. Regional banks are more likely to have the resources necessary to compete successfully in multiple markets simultaneously. In fact, some have argued the necessity of such banks to diversify and move into non-traditional services (Crane and Eccles, 1987). These banks are significantly larger than those in the remaining clusters, with average assets of $2.1 billion.

Cluster 4 - Focused Retailers

Banks in this cluster rank first in the categories of retail loans (loans to individuals) and real estate loans. This pattern is often characterized as a retail orientation (Passmore, 1985). On average, 43% of their lending/investment portfolio is in real estate loans and 24% is in loans to individuals. Banks in this cluster are below average in other lending/investment categories, and are not heavily involved in non-traditional products or funding sources. They rank first in deposits/assets, indicating a somewhat stronger than average reliance on traditional deposits. Because deposits from individuals are traditionally thought to be a more stable source of funds than commercial deposits, these banks probably have less need for non-traditional sources. In keeping with
this logic, they also rank last in large certificates of deposit (over $100,000) as a percentage of deposits. Thus the patterns demonstrated by the strategic variables all point consistently toward a retail orientation.

Classification of banks as either retail or wholesale oriented is quite common in the literature (Reger, Duhaime and Stimpert, 1992; Passmore, 1985). Retail banks deal predominantly with individuals and small businesses, while wholesale banks borrow from and lend to, large corporate accounts. Passmore (1985) clustered a relatively small number of regional and multinational banks on lending and deposit categories, and found that they fell into retail and wholesale clusters.

Cluster 5 - Generalist Wholesalers

Banks in this cluster were a little more difficult to characterize. The overall pattern suggested a wholesale orientation; i.e., they ranked first in commercial loans, first in fee income, and first in large C.D.'s as a percentage of deposits. A larger degree of fee income is consistent with a wholesale orientation, as corporate customers are more likely to purchase non-credit services such as cash management accounts and wire transfers (Crane and Eccles, 1987). Also, corporate deposits are likely to be less stable, so it is logical that there is a greater reliance on "bought money"; i.e., large C.D.'s. However, it was also noted that these banks displayed a broader
focus than the other focused clusters. On average, commercial loans made up 33.8% of the lending/investment portfolio, but these banks also invested rather heavily in real estate loans (24.5%) and loans to individuals (21.5%). In addition, they participated heavily in other less traditional products, such as credit cards (53.2%) and leasing (24.8%). In general, these banks seem to take on a wholesale orientation; i.e., catering to businesses, but remain rather heavily involved in a number of different activities. Thus, they are characterized as generalist wholesalers.

Given the uncertain lending environment for wholesale bankers in the early 1980's, high interest rates and an increase in the number of alternate funding sources available to businesses, it is perhaps not surprising that these banks chose to diversify their risks. This notion is supported by Goodman's (1988) finding that banks following a focused commercial lending strategy during the early 1980's were the least profitable.

Summary

The first goal of the cluster analysis was to develop a limited set of differentiated and interpretable strategic groups. After deleting those strategic variables found to be undifferentiated, the cluster analysis yielded five distinct strategic configurations: focused security investors, focused agricultural lenders, generalists,
focused retailers, and generalist wholesalers. The patterns for these groups are fairly distinctive and were easy to interpret. Also, these strategic types are similar to those described in the banking literature (Guarino, 1991; Goodman, 1988; Passmore, 1985). Thus, the cluster analysis appeared to accomplish its first goal.

The final step in the cluster analysis, was to use the clusters to detect and code strategic change. The next section details the results of this process and examines the patterns of strategic change that occur.

Patterns of Strategic Change

As noted, the above cluster analysis includes two observations for each bank in the sample. Banks that fail to change strategies will occur twice in the same cluster. Those that change strategies will fall into two clusters. Table 8 gives a detailed breakdown of the changes that occurred in group membership. The columns represent group membership in 1985, while the rows represent 1982 membership. Thus, the diagonal elements in the table depict the number of banks that remained in their groups, while the off diagonal elements represent changes in group membership. Overall, 492 firms, or 57% of the sample changed strategies, while 369 exhibited no change. These results are consistent with those found in previous studies that examined change during periods of environmental
Table 8. Changes in Group Membership and Distances Between Cluster Centroids

<table>
<thead>
<tr>
<th>1982 Strategies</th>
<th>1985 Strategies</th>
<th>1982 Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1: Focused Investors</td>
<td>2: Focused Ag. Lenders</td>
</tr>
<tr>
<td>Focused Investors</td>
<td>51 (distance) (3.54)</td>
<td>0 (distance) --</td>
</tr>
<tr>
<td>Focused Ag. Lenders</td>
<td>117 (distance) (3.54)</td>
<td>16 (distance) --</td>
</tr>
<tr>
<td>Generalists</td>
<td>1 (distance) (5.39)</td>
<td>0 (distance) --</td>
</tr>
<tr>
<td>Focused Retailers</td>
<td>230 (distance) (2.65)</td>
<td>0 (distance) --</td>
</tr>
<tr>
<td>Generalist Wholesalers</td>
<td>53 (distance) (3.01)</td>
<td>0 (distance) --</td>
</tr>
<tr>
<td>1985 Total</td>
<td>452</td>
<td>16</td>
</tr>
<tr>
<td>Total entered</td>
<td>401</td>
<td>0</td>
</tr>
<tr>
<td>Total exited</td>
<td>12</td>
<td>125</td>
</tr>
</tbody>
</table>

Total Number of Changes = 492 Total Number of Non-Changes = 369
upheaval. Thus, as expected, change was a rather common occurrence in the banking industry during this time period. As can be seen, there was a strong movement away from the agricultural lending (cluster 2) and retail strategies (cluster 4), toward securities investment (cluster 1). In fact over half the 1985 sample of banks (53.5%) followed an investment strategy, compared to 7.3% that followed this strategy in 1982. In contrast, a meager 1.8% followed an agricultural strategy and 18.8% followed a retail strategy in 1985, compared to 16.4% and 46.7%, respectively, in 1982. Generalists (cluster 3) and wholesaling generalists (cluster 5) experienced less drastic changes in group membership. A total of 125 (88.6%) focused agricultural lenders changed their strategies, with 117 of these changing to an investment focus. 272 (67.6%) of the retailers changed strategies, 230 of which changed to an investment focus. Eighty banks (34.5%) in the generalist wholesaler group changed strategies, with the majority switching to an investment strategy. However, 48 banks also switched to a generalist wholesale strategy, mostly from the focused retail strategy.

Two things are particularly interesting about the patterns of change that occurred. First, the notion of centroid distances acting as surrogate for mobility barriers seems to be borne out by the changes noted. Table
9 presents a comparison of centroid distances and number of changes. As can be seen, the number of changes decreases dramatically as the distance scores increase.

Table 9. Centroid Distances and Strategic Change

<table>
<thead>
<tr>
<th>Centroid Distance</th>
<th>Number of Changes</th>
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<tbody>
<tr>
<td>2.49</td>
<td>59</td>
</tr>
<tr>
<td>2.65</td>
<td>233</td>
</tr>
<tr>
<td>3.01</td>
<td>61</td>
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<td>3.54</td>
<td>117</td>
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<td>3.68</td>
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<td>5.51</td>
<td>7</td>
</tr>
<tr>
<td>6.71</td>
<td>0</td>
</tr>
</tbody>
</table>

To test this, the firms were classified into three groups: those making slight changes (centroid distance less than 3.0; n=292), those making moderate changes (centroid distance greater than 3.0 but less than 4.0; n=183), and those making extreme changes (centroid distance greater than 4.0; n=17). A chi-square goodness of fit test indicated that these frequencies were significantly different from an even distribution (chi-square = 358.8, p<.001).
Second, it is interesting to note that strategic change was quite common among the more focused groups, apparently as their niches became less accommodating following deregulation. Goodman (1988) noted that retail and agricultural lenders were among the least profitable in 1983, which he attributed to the recession occurring at that time, combined with a particularly strong decline in the agricultural economy. The move toward an investment strategy may reflect either a desire to adopt a more conservative strategy during this turbulent time, or simply a lack of suitable lending opportunities available in their relevant markets. On the other hand, the generalists in clusters 3 and 5 were apparently in a better position to deal with the changes, due to their diversity. This is consistent with the population ecology argument that generalists tend to be better suited than specialists to conditions of "coarse grained" environmental change. In general, the patterns of change noted seem to make sense from both a theoretical and historical perspective.

The change patterns noted above are similar to those found by Guarino (1991). He examined changes in portfolio patterns between 1978 and 1987 and found that there was a general movement away from agricultural and retail loans, toward investments. Although he did not measure scope, per se, he found that larger banks exhibited less change.
Medium and large commercial lenders (wholesalers) exhibited very little change.

Summary

An examination of the changes and change patterns yielded some interesting insights. First, it was noted that strategic change was not an uncommon event, and the frequency with which it occurred during the time of this study is consistent with that found in other studies. Second, the patterns of change were non-random and seemed to make sense from both a theoretical and historical perspective. Finally, the patterns noted, are similar to those found in the study by Guarino (1991). Thus, the results of the cluster analysis and the changes identified seem to provide valid data for testing the hypotheses.

Testing Change Antecedents

This section examines the impact of certain variables that are thought to inhibit or encourage change efforts. Hypotheses one and three suggested that low or declining performance and a lack of slack resources will prompt organizations to change strategies. Furthermore, it was suggested that lower levels of performance and slack will induce greater magnitudes of change. Hypotheses five and seven argue that inertial forces associated with age and size will inhibit change efforts. That is, the greater the size and the older the organization, the lower the magnitude of change.
The above hypotheses were tested with a multiple regression model, using the SAS REG procedure. Table 10 presents the means, standard deviations, and correlations among the independent variables. The results of the regression are summarized in Table 11, which contains standardized and unstandardized regression coefficients, as well as the standard errors and t-statistics.

Discussion of the outcomes will proceed in three steps. First, the overall model will be evaluated for its significance and appropriateness. Second, the results of the analyses will be discussed in terms of their implications for the hypotheses. Finally, the results will be summarized and discussed.

Evaluating the Model

Before estimating the model, each of the variables were assessed for normality. Although normality of the independent variables is not an assumption of regression (Kerlinger and Pedhazur, 1973), Hair et al. (1992) suggest that they be assessed and, if necessary, subjected to transformations to improve normality. The SAS Univariate procedure was used to produce normal probability plots, box plots, and the Shapiro-Wilkes statistic. Only three of the eleven variables passed the Shapiro-Wilkes test, although many of the variables did not appear to depart drastically from normality. Log transformations significantly improved
Table 10. Correlations Among Independent Variables - Full Sample

<table>
<thead>
<tr>
<th></th>
<th>ROABEF</th>
<th>ROACHBEF</th>
<th>EFFBEF</th>
<th>EFCHBEF</th>
<th>CHLNASBE</th>
<th>SLACKBEF</th>
<th>ASCAPBEF</th>
<th>LAGE82</th>
<th>LASSET82</th>
<th>HOLDC</th>
<th>UNEMP85</th>
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</tr>
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<td>ROACHBEF</td>
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<td>1.00000</td>
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<tr>
<td>EFFBEF</td>
<td>-0.15865</td>
<td>-0.10629</td>
<td>1.00000</td>
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<tr>
<td>EFCHBEF</td>
<td>-0.14944</td>
<td>0.08455</td>
<td>-0.85139</td>
<td>1.00000</td>
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</tr>
<tr>
<td>CHLNASBE</td>
<td>-0.07324</td>
<td>0.20369</td>
<td>-0.14570</td>
<td>0.17311</td>
<td>1.00000</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>SLACKBEF</td>
<td>0.00849</td>
<td>-0.01465</td>
<td>0.02804</td>
<td>0.00179</td>
<td>0.03094</td>
<td>1.00000</td>
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</tr>
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<td>ASCAPBEF</td>
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Mean 1.086  -0.042  0.592  0.023  -0.958  0.143  12.23  3.78  10.41  0.458  7.38
St. Dev. 0.674  0.411  0.328  0.463  3.95  0.205  2.94  0.944  1.12  0.498  1.72
Table 11. Results of Regression Analysis for Degree of Change

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<th>Variable</th>
<th>Unstandardized Regression Coefficient</th>
<th>Standard Error</th>
<th>t-statistic</th>
<th>Beta</th>
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<td>.014</td>
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<td>.296</td>
<td>-.736</td>
<td>-.101</td>
</tr>
<tr>
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<td>.013</td>
<td>-2.371 **</td>
<td>-.122</td>
</tr>
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<td>.247</td>
<td>-8.006 ***</td>
<td>-.406</td>
</tr>
<tr>
<td>ASCAP</td>
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<td>.055</td>
<td>6.424 ***</td>
<td>.333</td>
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<td>-.170</td>
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<tr>
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<td>.645</td>
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<td>1.71</td>
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</table>

R² = .2060  F = 19.925  N = 857

*  p < .10  
** p < .05  
*** p < .01

the distribution of the size and age variables, and these transformations were retained for the analysis.

The overall model was highly significant, with an F value of 19.925, and it explained slightly over 20% of the variance in the dependent variable (R² = .206). Four of the prior performance measures and the control variables...
were not significant. A separate regression model, estimated without the control variables produced almost identical results and is not reproduced here. Four observations were dropped from the analysis due to missing variables, resulting in a sample size of 857.

The major assumptions of regression are: 1) the relationship between independent and dependent variables is linear, 2) constant variance of the error terms (homoscedasticity), 3) independence of error terms (autocorrelation), and 4) normal distribution of error terms (Hair, et al., 1992). Other important items that can distort results are multicollinearity and outlying observations.

The most commonly used tool for detecting non-linearity and unequal variances (heteroscedasticity) is the analysis of residuals (Lewis-Beck, 1980; Hair et al., 1992). This technique involves the visual inspection of partial residual plots. A healthy plot will exhibit no pattern; i.e., the points will be scattered randomly. Nonlinear relationships can be indicated by a curvilinear pattern to the residuals, and heteroscedasticity is revealed by fan or diamond shaped patterns in the residuals.

An inspection of the partial residual plots revealed no curvilinear patterns nor the typical patterns associated with unequal variance. Therefore, it was concluded that
the linearity and equal variance assumptions were adequately met.

The independence of error terms was evaluated using the Durbin-Watson d statistic. This statistic is commonly used to test for the existence of a first order autoregressive process (Freund and Littell, 1986). The value of the d statistic was 1.705. According to the table for this statistic, a value less than 1.561 (for n=200-maximum in the table, k=11) indicates the existence of a first order autocorrelation at a significance level of .01. Since the value of d for the model exceeds this value, the test suggests that the assumption of independent terms has been met.

Normality of the error term was evaluated using a normal probability plot, histogram, and Shapiro-Wilkes statistic generated by the SAS Univariate procedure. The Shapiro-Wilkes test suggested a lack of normality among residuals. Examination of the histogram revealed a clear bi-modal distribution, with the sample fairly evenly split. This split was also observed in a visual examination of the residual plots, where the observations were noted to cluster in two groups. Careful examination of the data revealed that this split was quite clearly between the banks that changed and failed to change strategies. Thus, although the data was measured on a continuous scale of distance between clusters, the outcome was a fairly
distinct grouping into two categories, change and no-change. Cohen and Cohen (1983) note that the result of this type of analysis, which is in effect a biserial correlation, must be interpreted with caution. The relationships suggested by a regression analysis are hypothetical correlations, that could be obtained if the categorical variable were in fact continuous. They suggest that the significance of a bivariate biserial correlation be confirmed by a t test on the difference between the means. The multivariate equivalent would be to perform a discriminant or logit model. Therefore, the observations were coded as change or no change, and evaluated using a logit model. The results are very similar to the regression model (see Appendix A). The variables that are significant in the regression model remain significant in the logit model, and the parameter estimates are all in the same direction. Thus, the validity of the model is confirmed, despite this deviation from normality.

Two other problems that can distort regression results are multicollinearity and outlying observations. An examination of the correlation matrix for the independent variables (Table 10), reveals a potential collinearity problem due to the high correlations between the efficiency and change in efficiency variables (.85). To further assess multicollinearity, the variance inflation factor (VIF), and its inverse, the tolerance value, were
calculated. Although an exact threshold value of the VIF is not available, values considerably larger than one indicate serious multicollinearity problems (Neter, Wasserman, and Kutner, 1989). Hair et al. (1992) suggest a cutoff value of 10 for the VIF value and a corresponding value of .10 for the tolerance value. Once again, the efficiency and change in efficiency variables were identified as potential problems, with VIF scores of 8.39 and 8.44, respectively. To evaluate the impact of these variables, two additional regression models were estimated, one deleting the efficiency variable and the other deleting the change in efficiency variable. Each of these reduced models produced almost identical results to the full model (see Appendix B), therefore a decision was made to leave the variables in the model.

Perhaps the most striking feature of the residual plots, was a large number of obvious outlying observations. Approximately 20 observations were identified as outliers, based on their studentized residuals exceeding a value of 2. Each of these observations was examined carefully for coding or input errors but none were detected. Although outlying observations can significantly impact a regression model, most authors suggest that their exclusion be based on pressing practical (errors) or theoretical reasons (Neter, Wasserman, and Kutner, 1989). Since neither of these reasons existed, the observations were retained.
Summary of Model Evaluation

The initial regression model proved to be robust, despite some potential problems identified with non-normality of the error terms, and multicollinearity. The bi-modal distribution apparently had little impact on the regression results, as confirmed by the similar results obtained with the logit model. However, as noted by Cohen and Cohen (1983), the limited distribution of the data means that the results of the regression must be interpreted with caution. In effect the results may be more indicative of a change/no change relationship, rather than a degree of change relationship. Also, the collinearity associated with the two efficiency variables proved to have no substantial impact on the model. Although a number of outliers were identified, they were retained in the model as there existed no practical or theoretical reason for removing them.

Results

Hypothesis 1 predicts that organizational performance will be negatively related to degree of change. That is, organizations experiencing low or declining performance will be more motivated to make large scale changes. The model contained five measures of performance intended to correspond with overall financial performance (ROA and change in ROA), efficiency (efficiency ratio and change in efficiency ratio), and effectiveness (Change in loans to
assets). Table 11, demonstrates mixed support for the first hypothesis. One of the performance variables, change in loans to assets (Chlnas), was significantly related to degree of change. The negative relationship suggests that organizations experiencing declining loan portfolios were more likely to make strategic changes. Most of the remaining performance variables were negatively related to change, but were not significant. The overall evidence suggests that a decline in effectiveness, or strategic performance, is a strong force for change, but efficiency and overall financial performance are not.

Hypothesis 3 predicts that slack resources will be positively related to degree of change. In other words, higher levels of slack resources will tend to encourage major changes. Two measures of slack resources were used, the liquidity ratio (LIQUID) and assets to capital (ASCAP). When interpreting the regression coefficients, it is important to note that Ascap is inversely related to liquidity. That is, high levels of ASCAP indicate relatively low levels of capital. As can be seen in Table 11, the regression model provided mixed support for hypothesis 3. The liquidity ratio, which is the banking equivalent to a current ratio, was strongly and negatively related to degree of change. Banks with low levels of liquid assets, (cash, readily converted investments, and net fed funds loans), were more likely to make major
changes in strategy than those with high levels of liquid assets. On the other hand, banks with relatively high levels of capital (low ASCAP) were significantly more likely to make major strategic changes than those with low levels of capital.

The negative relationship between liquid resources and change fails to support hypothesis 3 and on the surface seems to lend credence to the buffering arguments of Starbuck and others (1988). That is, high levels slack may serve to dull the organization's senses and discourage change efforts. On the other hand, the positive relationship between capital resources and change, supports hypothesis 3, and indicates that slack resources in the form of capital, encourage change and experimentation (Bourgeois, 1981). Apparently, those banks with a larger capital base were more likely to take risks and incur the expenses associated with change. On the other hand, banks with higher levels of liquid resources were less willing to make changes. These finding are interesting and suggest the need to delve further into the relationship between slack and change, and perhaps to further explore the definitional and measurement issues surrounding the slack construct itself.

Hypothesis 5 predicts that organizational age will be negatively related to degree of change. Table 11 reveals that age and degree of change were significantly related,
but in the opposite direction from that predicted. Contrary to predictions, older organizations were significantly more likely to make changes in their strategy than younger organizations. Because this finding was both unexpected and difficult to explain, additional analysis was performed to rule out alternate explanations. First, since the argument concerning age was based on the concept of inertia, it was reasoned that inertia and age are not likely to be related in a continuous manner. If inertial forces increase with age, there may be some point relatively early in the life of an organization when inertia becomes a relatively fixed feature. To test this notion, age was dichotomized at five years, and the regression model was re-estimated with age as a dummy variable. This analysis produced very similar results, i.e., age remained positively related to change.

It was also reasoned that an organization's original strategy may be highly correlated with age, and that the observed relationship could be spurious. That is, change may be dictated primarily by the original strategy, with age being indirectly related by its correlation to cluster membership. To test for this, a separate regression model was estimated and original cluster membership was introduced as a control variable. This analysis produced
even stronger results for age\textsuperscript{6}. These results confirmed the original outcome, and suggested a particularly strong relationship between age and degree of change. The implications of these findings will be explored more thoroughly in the discussion section.

Hypothesis 7 predicts that organizational size will be negatively related to degree of change. Table 11 reveals that assets (LASSET) are significantly related to degree of change in the predicted direction. Thus, large organizations were found to be less likely to change strategies than small organizations. This is consistent with the notion that smaller organizations tend to be more flexible and less subject to inertial forces than larger organizations. However, it is important to note that this relationship could be spurious. When original strategies (clusters) are entered into the equation, size becomes insignificant. Because the patterns of change noted in the cluster analysis were strongly suggestive of a relationship between strategy and change, and since size was noted to be related to strategy, it is assumed that the changes were driven by strategy, and that the size-change relationship is spurious.

\textsuperscript{6}Since this explanation could apply to any of these results, it is worth noting that controlling for group membership produced very similar results for most of the variables. The only exception was size. The implication of this outcome will be further discussed in the following section.
Discussion

In summary, the evidence supporting the relationships between performance, slack, size, and age on degree of change is mixed. A decline in effectiveness, as measured by a drop in loans, was found to be a significant predictor of change. The two measures of slack were also found to significantly predict change, but in opposite directions. High levels of liquidity apparently serve to buffer the organization, while high levels of capital seemed to encourage change. Organizational age was also a significant predictor, but in the opposite direction than predicted, and size was not a significant predictor, when original strategies were controlled.

The findings concerning slack resources and age were both interesting. When measured in terms of liquidity, slack exhibited a negative relationship to change. This can be explained using the notion of environmental buffering, however, alternative explanations may be even more plausible. For example, high levels of liquidity may also be indicative of an organization's overall disposition toward risk. This is particularly true in the banking industry, where liquid assets offer clearly lower returns, but lower risk. Thus, the findings concerning liquidity and change may be tapping the related construct of risk disposition. High levels of liquid resources indicate risk
aversion, which also is consistent with an unwillingness to make changes.

On the other hand, when measured as capital, slack resources were positively related to change. Excess capital and loan loss reserves serve as a primary lines of defense against loan losses. Moving into less familiar lending markets or niches is apparently made much easier when there is a cushion available to absorb possible mistakes. This is consistent with the notion that slack resources encourage change and experimentation (Bourgeois, 1981; Cyert and March, 1963).

The robust findings concerning the relationship between age and change, suggest that the inertial arguments proposed by the selection theorists may need revision. Rather than becoming more inert, older organizations, at least in the banking industry, apparently become more flexible and willing to make changes. The population ecologists note that certain routines and skills become embedded in organizations over time (Hannan and Freeman, 1984). This notion of organizations continuing in a set of established routines is part of the reasoning behind the inertia argument. Established routines are said to increase the organizations' level of accountability and reliability, and thus have survival value. Supposedly, the price to pay for this, is a reduction in flexibility. However, something that this position fails to consider is
that flexibility and the ability to learn are also organizational skills that can enhance survival. It also makes sense that these abilities are acquired over time, as the organization experiences and overcomes environmental or internal upheavals. Thus, one argument consistent with the above findings, is that organizations learn, and become more adept at reacting to their environments over time. Therefore, it perhaps should not be as surprising as theory would lead us to believe, that age is positively correlated with change.

Another interesting finding was that size became insignificant when the original strategies were entered into the regression equation. Since certain patterns of change were noted to occur relative to the scope of the organization, this suggests that strategy rather than size may be the driving force behind strategic change. Given the amount of attention and research that has been placed on the size/inertia argument, this finding could be quite meaningful and certainly suggests the need for further research.

The picture that emerges from these findings is that certain adaptive forces, such as slack resources and a decline in effectiveness encourage strategic change. Age, which was thought to represent an inertial force, instead was positively related to change. The only factor found to inhibit strategic change was excess liquidity. Although
this may be explained with the buffering argument, an equally plausible explanation is that it represents an overall bias toward risk aversion. Finally, an interesting finding was that strategy also seemed to be a significant predictor of change.

Testing the Strategic Change/Performance Relationship

This section tests those hypotheses regarding factors that are thought to moderate the relationship between organizational change and performance. Hypothesis 2 contends that performance prior to the change will significantly impact change outcomes. Specifically, organizations exhibiting low or declining performance prior to the change are argued to benefit more from the change than those exhibiting higher or increasing performance. Hypothesis 4 predicts that slack resources will have a positive impact on performance for all firms, but they will be significantly more important for firms that choose to change strategies. Hypotheses 5 and 8 predict that inertial forces associated with size and age will have a negative impact on performance for firms that change strategies, but have certain benefits that are likely to have a positive relationship to performance for firms that fail to change strategies. Finally, hypothesis 10 proposes that degree of change will be positively related to performance.
All hypotheses except degree of change were tested with a series of multiple regression and hierarchical regression models. Tables 12 and 13 present separate means, standard deviations, and correlations among the independent variables for the change and no-change samples. The multiple regression results are summarized in Tables 14, 15, and 16, which contain standardized and unstandardized regression coefficients, as well as the standard errors and t-statistics for the three different performance outcomes. Hierarchical regression results are presented in Tables 17, 18, and 19. The hierarchical regression models were estimated for each moderator to test for an interaction effect. The significance of an interaction is that the regression lines determined separately in the change and no-change groups have significantly different slopes, hence performance outcomes depend on the level of those variables. The multiple regression models tested the basic direction of the hypothesized relationships. It is important to note that it is not necessary for the main effects (those in the multiple regression model) to achieve significance in order to interpret the interaction term (Baron and Kenny, 1986; Bedeian and Mossholder, 1994). Thus, the main test for moderation will consist of the significance of the interaction term, with the multiple regression results providing evidence as to the direction of the relationship.
### Table 12. Correlations Among Independent Variables - Firms that Changed Strategies

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<tr>
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<th>ROACHBEF</th>
<th>EFBEF</th>
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</table>

| Mean  | 1.158 | -0.056 | 0.577 | 0.013 | -1.532 | 0.076 | 11.785 | 3.983 | 10.169 | 0.397 | 7.346  |
| St. Dev. | 0.626 | 0.406 | 0.170 | 0.195 | 3.634 | 0.191 | 2.798 | 0.731 | 0.889 | 0.489 | 1.699  |
Table 13. Correlations Among Independent Variables - No-Change Sample. n=326

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Mean    | 1.021   | -0.037  | .633   | .000   | -.469   | .229    | 12.753   | 3.568  | 10.713   | .512   | 7.483   |
St. Dev. | .554    | .382    | .238   | .187   | 4.014   | .196    | 2.938    | 1.078  | 1.262    | .501   | 1.759   |
Table 14. Results of Regression Analysis for Change in ROA(DROA)

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</table>

R² = .2087 F = 15.233*** N = 471
R² = .1782 F=8.536*** N=323

* p < .10
** p < .05
*** p < .01

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Table 15. Results of Regression Analysis for Change in Efficiency

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R² = .0717  F = 4.462***  N = 471

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<th>Beta</th>
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R² = .1177  F = 5.252***  N = 324

*  p < .10
** p < .05
*** p < .01

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Table 16. Results of Regression Analysis for Change in Loans/Assets

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<th>Unstandardized Regression Coefficient</th>
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<table>
<thead>
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<th>Beta</th>
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* p < .10
** p < .05
*** p < .01
Table 17. Results of Hierarchical Regression Analysis with Change in ROA as the Dependent Variable, n=797

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<tr>
<th>Variables</th>
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* p < .10
** p < .05
*** p < .01

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<table>
<thead>
<tr>
<th>Variables Included</th>
<th>Cumulative R-squared</th>
<th>Unstandardized Regression Coefficients</th>
<th>F-ratio for Individual Variables</th>
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*p < .10
** p < .05
*** p < .01
Table 19. Results of Hierarchical Regression Analysis with Change in Loans/Assets (CHLNASAF) as the Dependent Variable n=797

<table>
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<th>F-ratio for Individual Variables</th>
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<td>-.16711</td>
<td>1.09</td>
</tr>
<tr>
<td>Change x ASCAP</td>
<td>0.0031</td>
<td>-.1519</td>
<td>.23</td>
</tr>
<tr>
<td>ASCAP</td>
<td></td>
<td>.0749</td>
<td>1.96</td>
</tr>
<tr>
<td>Change x ASCAP</td>
<td>0.0032</td>
<td>.2745</td>
<td>.04</td>
</tr>
<tr>
<td>Change x LIQUID</td>
<td></td>
<td>.0945</td>
<td>1.35</td>
</tr>
<tr>
<td>Change x LIQUID</td>
<td></td>
<td>-.0345</td>
<td>1.01</td>
</tr>
<tr>
<td>Change x LAGE</td>
<td>0.0008</td>
<td>-.2502</td>
<td>.61</td>
</tr>
<tr>
<td>LAGE</td>
<td></td>
<td>.0622</td>
<td>.13</td>
</tr>
<tr>
<td>Change x LAGE</td>
<td>0.0047</td>
<td>2.0974</td>
<td>2.32</td>
</tr>
<tr>
<td>LAGE</td>
<td></td>
<td>.3076</td>
<td>1.92</td>
</tr>
<tr>
<td>Change x LAGE</td>
<td></td>
<td>-.6149</td>
<td>3.07*</td>
</tr>
<tr>
<td>Change x LASSET</td>
<td>0.0117</td>
<td>.0095</td>
<td>.00</td>
</tr>
<tr>
<td>LASSET</td>
<td></td>
<td>.4297</td>
<td>8.92***</td>
</tr>
<tr>
<td>Change x LASSET</td>
<td>0.0106</td>
<td>-2.9630</td>
<td>.94</td>
</tr>
<tr>
<td>LASSET</td>
<td></td>
<td>.3102</td>
<td>2.70*</td>
</tr>
<tr>
<td>Change x LASSET</td>
<td></td>
<td>.2859</td>
<td>.96</td>
</tr>
</tbody>
</table>

* p < .10
** p < .05
*** p < .01

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Since degree of change pertains to organizations that change strategies, this hypothesis will be assessed with a separate regression equation.

The discussion below will proceed in three stages. First the overall adequacy of the models will be assessed. Second, the results of the analyses will be examined in light of their implications for the hypotheses. Finally, the implications of the results will be discussed and summarized.

**Multiple Regression Models**

Tables 14, 15, and 16, present the results of the multiple regression analyses for the three different performance outcomes. Separate regression equations were estimated for banks that changed and did not change, resulting in a total of six different equations. Log transformations of age and size were used because they resulted in a distribution that more closely resembled normality. Each model was statistically significant, although the R-squared values indicate that the moderators did a better job of explaining changes in ROA ($R^2 = .208$ and .178) than they did for efficiency ($R^2 = .071$ and .118) or loans to assets ($R^2 = .042$ and .079). It is worth noting, once again, that the significance of main effects is irrelevant when testing for moderation (Cohen and Cohen, 1983; Bedeian and Mossholder, 1994). Thus, the significance or lack of significance in the multiple
regression equations is not a factor in testing the hypotheses. However, the directions of the relationships are important, since they were specifically predicted.

The pattern of residuals from the partial regression plots suggested no significant problems with heteroscedasticity or non-linearity. The Durbin-Watson d values all indicated no significant problems with autocorrelation. Normal probability plots, histograms, and the Shapiro Wilkes statistic all revealed departure from normality for residuals when using change in ROA (DROA) and change in efficiency (DEFF). Various transformations suggested by Hair et al. (1992) failed to correct this problem. A number of researchers have suggested that the violation of normality is the least serious of the assumption violations, particularly when the sample size is large (Lewis-Beck, 1980; Kerlinger and Pedhazur, 1973). Nevertheless, it may suggest caution when interpreting the results.

The correlation matrices for the change and no-change groups (Tables 12 and 13) revealed similar patterns to those observed for the full sample. Despite relatively high correlations between efficiency and change in efficiency, the VIP and Tol values indicated no problem with multicollinearity. As with the previous analysis, there appeared to be a significant number of outliers.
Inspection of the data revealed no coding errors, so the outlying observations were retained.

Hierarchical Regression Models

Table 17, 18, and 19 present the results of three sets of hierarchical regression models, one for each dependent variable. To maximize the chance of detecting a significant interaction effect, separate models were used for each moderator. A forward selection, model building approach found in the SAS REG procedure was used to fit three models for each moderator, one containing the change variable, one containing the change variable and a moderator, and one containing the change variable, the moderator, and an interaction term. The test for moderation involved testing the significance of the increase in variance explained when adding the interaction term to the model (indicated by the significance of the F ratio in the table).

Each of the hierarchical equations was significant, although many researchers do not consider the significance of the overall equation to be a requirement to detect significant moderation (Bedeian and Mossholder, 1994). As with any model containing an interaction term, the hierarchical models appear to suffer from relatively high levels of multicollinearity. This suggests that the individual regression coefficients should be interpreted with caution, however, the F tests of concern in this
analysis are not affected (Evans, 1991; Hair et al., 1992). Tables 17, 18, and 19 reveal few significant results for the interaction terms, suggesting that the hypotheses were generally not supported.

Results

Though not hypothesized, it is notable that a significant main effect was observed between change and two performance variables, ROA and efficiency. Change demonstrated a weak, but positive relationship with ROA. Because the efficiency measure actually represents an inverse measurement (higher levels of the efficiency measure indicate lower efficiency), efficiency was also noted to demonstrate a strongly positive relationship with change. That is, banks that changed strategies increased both their return on assets and efficiency. Since few studies have found significant main effects between change and performance, this result is quite interesting. The positive relationship between efficiency and change is particularly interesting, since it seems counter intuitive. These results will be further explored in the next section.

Hypothesis 2 predicts that prior performance will covary negatively with regard to subsequent performance. For firms that change strategies, prior performance was expected to be negatively related to subsequent performance, while the opposite was expected for firms that failed to change. The underlying notion is that
performance outcomes can be expected to vary, depending on the need for change.

Although prior performance in the form of ROA and efficiency are both significantly related to subsequent performance in the multiple regression equations, the direction of the relationship is the same for both groups. ROA is negatively related and change in ROA is positively related to subsequent ROA for both the change and no-change groups. The direction of the relationships is similar for the efficiency variables. Prior change in loans/assets was not a significant predictor for either the change or no-change groups. Furthermore, the hierarchical regression results indicate no significant difference in the slopes of these relationships. Thus hypothesis 2 is not supported.

Hypothesis 3 predicts that slack resources will be significantly related to subsequent performance for both firms that change and fail to change, but that it will be more important for firms that change. Hierarchical regression results indicated that slack resources in the form of liquidity did moderate the change/ROA relationship, but the direction of the relationship is different than predicted for banks that changed strategies. Thus hypothesis 3 is not supported.

Table 14 shows that slack resources were negatively related to ROA for firms that changed strategies and positively related for firms that failed to change. In
other words, slack resources seem to have a detrimental impact on performance for firms that change strategies, but a positive impact for those that fail to change. This result is surprising, given that slack resources are generally thought to ease the implementation of change efforts (Ginsberg and Bucholtz, 1990; Bourgeois, 1981). Possible explanations will be explored in the discussion section.

Hypothesis 5 predicts that organizational age will be negatively related to performance for firms that change strategies and positively related for those that fail to change. That is, age is likely to be an advantage under conditions of relative stability, but a disadvantage when attempting to change due to higher levels of inertia. This hypothesis was partially supported. Table 19 revealed that age (LAGE) was a marginally significant moderator for predicting change in loans/assets. Furthermore, the multiple regression results indicate that the relationships occurred as predicted. Thus, the results support the notion that age can serve to moderate certain performance outcomes between the change and no-change banks.

Hypothesis 8 predicts that organizational size will be negatively related to performance for banks that change strategies and positively related for banks that fail to change. The general idea is that inertial forces associated with size make change more difficult. However,
size has certain advantages that accrue to firms that fail to change. There is no evidence to support this hypothesis. The results suggest that size has equally positive benefits for ROA and efficiency, and equal drawbacks for change in loans to assets. That is, there is no moderating effect.

Discussion

Several results of the analysis are interesting and call for further exploration. First, an interesting finding from the hierarchical regressions, is that change alone had a significant main effect on performance. Change was positively related to subsequent ROA and efficiency. These results were unanticipated and quite suggestive. Few studies have found any significant relationships between strategic change and financial performance, and the relationship between efficiency runs counter to the inertia arguments proposed by selection theorists and many strategic management proponents. However, several studies from the turnaround literature have found that organizations often attempt strategic and operating turnarounds simultaneously, and there is some evidence to suggest that both types of actions are necessary to effect successful turnarounds (Schendel and Patton, 1976; Grinyer and McKiernan, 1990; Robbins and Pearce, 1992). Thus, the notion that organizations may seek efficiency and strategic improvements at the same time is not unprecedented. This
finding seems to place some of the basic tenants of selection theory in doubt.

Another result that was both surprising and counter intuitive was the negative relationship between slack resources and prior performance that moderated performance outcomes for organizations that changed strategies. Though surprising, this outcome may be consistent with the previous finding concerning slack resources and propensity to change. As noted above, liquidity was found to be negatively related to degree of change. This could be due to a buffering effect, that dulls the organization and makes it less reactive to its environment, or may reflect an over-all aversion to risk. The buffering argument suggests that these organizations may delay change, resulting in a general decline in performance prior to the change, and/or resulting in lost opportunities that are associated with a first-mover advantage. Since this study fails to detect the precise timing of the change, either of these explanations could explain the negative relationship between slack and subsequent performance. The risk aversion argument suggests that high levels of slack may be associated with an incremental or evolutionary approach to change. This approach may be less risky, but it also may mean lower levels of performance when environmental changes dictate organizational changes of a more quantum nature.
Whatever the reason, this finding is interesting and suggests the need for further research.

Summary

Overall, the analysis provided little support for the hypotheses concerning performance outcomes. Prior performance and size had no moderating impact on subsequent performance. Age was found to moderate the relationship in the expected direction for loan portfolio growth, but not for overall financial performance or efficiency. Slack resources also were significant moderators of ROA outcomes, but in a different direction than hypothesized.

Degree of Change

Hypothesis 11 predicts that among survivors of change, degree of change will be positively related to performance. This is based on the notion of there being a risk/return tradeoff involved in making major changes. Although large scale changes are likely to be riskier, the returns associated with such changes are assumed to be larger. This hypothesis was tested with three regression models, one for each performance measure. Table 20 presents the results of the regression analysis for the three different performance outcomes. The regression models were first estimated using only those firms that changed strategies. Given the bi-modal distribution of the data, it was felt

*Models were also estimated using all the independent variables from the previous analysis. The results were consistent with those reported in Table 20.*
that a clearer picture of degree of change would emerge by eliminating those firms that did not change. The following sections evaluate the adequacy of the models, report the results, and discuss the implications.

Adequacy of the Models

The model with efficiency as the dependent variable failed to achieve overall significance and thus is excluded from the following analysis. Neither of the remaining models explained a great deal of variance, but degree of change did a better job of explaining changes in ROA ($R^2 = .062$) than changes in loans/assets ($R^2 = .020$).

Residual plots suggested no problems with heteroscedasticity and no deviations from linearity. The Durbin Watson $d$ values indicated no problems with autocorrelation. The Shapiro Wilkes test suggested some deviation from normality for the residual plots for the ROA model; however, the histogram and normal probability plots indicated that the problem was not severe. The Tol and VIF values indicated no problems with multicollinearity. Once again, outliers were retained in the analysis.

Results

Degree of change was predicted to be positively related to change for firms that changed strategies and survived. Table 20 reveals that degree of change was significantly related to ROA outcomes, but in the opposite direction from that predicted. In other words radical
Table 20. Results of Regression Analyses for Performance with Degree of Change as the Independent Variable (n=471)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression Coefficient</th>
<th>Standard Error</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference in ROA as the dependent variable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCHNG</td>
<td>-.283</td>
<td>.079</td>
<td>-3.550***</td>
</tr>
<tr>
<td>HOLDC</td>
<td>-.157</td>
<td>.096</td>
<td>-1.637</td>
</tr>
<tr>
<td>UNEMP</td>
<td>.073</td>
<td>.028</td>
<td>2.630***</td>
</tr>
<tr>
<td>R² = .0623</td>
<td></td>
<td>F = 10.348***</td>
<td></td>
</tr>
</tbody>
</table>

Difference in efficiency as the dependent variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression Coefficient</th>
<th>Standard Error</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCHNG</td>
<td>.024</td>
<td>.039</td>
<td>.621</td>
</tr>
<tr>
<td>HOLDC</td>
<td>.089</td>
<td>.047</td>
<td>1.900*</td>
</tr>
<tr>
<td>UNEMP</td>
<td>.007</td>
<td>.014</td>
<td>.568</td>
</tr>
<tr>
<td>R² = .0091</td>
<td></td>
<td>F = 1.423</td>
<td></td>
</tr>
</tbody>
</table>

Change in loans/assets as the dependent variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Regression Coefficient</th>
<th>Standard Error</th>
<th>t-statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCHNG</td>
<td>-.406</td>
<td>.329</td>
<td>-1.232</td>
</tr>
<tr>
<td>HOLDC</td>
<td>-.876</td>
<td>.397</td>
<td>-2.207**</td>
</tr>
<tr>
<td>UNEMP</td>
<td>.093</td>
<td>.115</td>
<td>.810</td>
</tr>
<tr>
<td>R² = .0203</td>
<td></td>
<td>F = 3.218**</td>
<td></td>
</tr>
</tbody>
</table>

* p < .10
** p < .05
*** p < .01

changes tended to have a detrimental effect on overall financial performance. This result was not predicted, but it is not surprising. This supports the notion advocated by many strategic management theorists concerning the
difficulty of overcoming mobility barriers (Porter, 1980). To the extent that cluster distance represents height of mobility barriers (Harrigan, 1985), one would anticipate changes between distant groups to be more difficult to successfully implement than those between more similar groups. Degree of change was also negatively related to change in loans/assets; however, this relationship was not significant.

Discussion

The finding that degree of change negatively impacts financial performance, combined with the previous finding that change alone is positively related to performance present an interesting set of results, even if not predicted. The implication of these findings is that change can have a positive impact on performance, but too much change can become detrimental to performance; i.e., there is a curvilinear relationship between change and performance. To directly test this observation, the sample was split into three different groups; no change, moderate change (distance < 3.0), and extreme change (distance > 3.0). A three-way ANOVA was run to test whether these three groups differed in terms of their performance. The results, shown in Table 21, support the notion of a curvilinear relationship. Each of the three performance measures was significant, and the performance for the moderate group was superior (recall that a negative change
Table 21. ANOVA Results. Three Levels of Change by Performance

<table>
<thead>
<tr>
<th>Performance Variable</th>
<th>No Change</th>
<th>Moderate Change</th>
<th>Extreme Change</th>
<th>F</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difference in ROA</td>
<td>-.5855</td>
<td>-.2688</td>
<td>-.8987</td>
<td>17.11</td>
<td>.0001</td>
</tr>
<tr>
<td>Difference in Efficiency</td>
<td>.0447</td>
<td>-.0376</td>
<td>.0113</td>
<td>2.51</td>
<td>.0817</td>
</tr>
<tr>
<td>Change in Loan/Asset</td>
<td>-.2441</td>
<td>-.0270</td>
<td>-1.5672</td>
<td>6.49</td>
<td>.0016</td>
</tr>
</tbody>
</table>

N = 326 336 135

in efficiency represents an improvement). This finding has important research implications as it may serve to explain the lack of significant findings that a number of researchers have experienced when examining the change/performance relationship. For example, this study detected no main effect difference in Loan/Asset growth, but controlling for degree of change revealed that those firms experiencing a moderate change achieved significantly better performance than those that failed to change or those that changed too much. Also, the weak main effect noted for ROA became highly significant when taking into account degree of change.

Testing the Strategic Change/Survival Relationship

This section tests those hypotheses regarding factors that are thought to moderate the relationship between organizational change and survival. Hypotheses 2, 4, and 6 predict the identical relationships between change and
survival that were predicted between change and performance. Hypothesis 2 contends that organizations exhibiting low or declining performance prior to changing will be more likely to benefit from the change, and will therefore, be more likely to survive. Hypothesis 4 predicts that slack resources will moderate the relationship between change and survival by improving the chances of survival for firms that change strategies. Hypothesis 6 predicts that inertial forces associated with age will reduce the chances of survival for organizations that change strategies. Hypotheses 9 and 10 predict different outcomes for survival than were predicted for performance. Hypothesis 9 predicts that organizational size will be positively related to survival for firms that change strategy. Finally, hypothesis 10 predicts that degree of change will be negatively related to survival; i.e., the greater the change, the lower the odds of survival.

Testing of these hypotheses proceeded in much the same manner as that used to test the change/performance moderators. A series of multiple and hierarchical logistic regression models were estimated to test for direction and interaction effects, respectively. A significant interaction term indicates that the variable in question moderates the change/survival relationship. The direction of that relationship will be determined by the multiple
logistic regression models performed on the change and no change groups. Once again, the significance of main effects in the logistic regression models is not a factor when testing for an interaction (Cohen and Cohen, 1983). Table 22 presents the results of the logit analysis for the change and no-change groups. Table 23 presents the results of the hierarchical logistic regression analysis.

Adequacy of the Models

The models were fitted using the LOGISTIC procedure found in SAS. The overall test for goodness of fit for logit equations is given by the likelihood value, or more correctly -2 log likelihood (-2LL). Although there is no true R-squared value in logit analysis, certain authors advocate the use of "pseudo" R-squares to aid in the interpretation. These values were computed as suggested by Aldrich and Nelson (1984), and are included in the tables. The overall test for goodness of fit for the no-change group was not significant. Bedeian and Mossholder (1994) argue that such significance is not crucial when testing for moderation. The crucial point of interest in this table is the direction of the results, not significance. The pseudo R-squared value for the change group was .1274 and for the no-change group was .0100.

The results of the hierarchical analysis are shown in Table 23. A forward selection, model building approach found in SAS's LOGISTIC procedure was used to fit three
Table 22. Results of Logistic Regression Analyses

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Regression Coefficient</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>.969</td>
<td>.457</td>
<td>4.506***</td>
<td>.377</td>
</tr>
<tr>
<td>ROACH</td>
<td>1.053</td>
<td>.493</td>
<td>4.567**</td>
<td>.245</td>
</tr>
<tr>
<td>EFF</td>
<td>3.260</td>
<td>2.204</td>
<td>2.187</td>
<td>.789</td>
</tr>
<tr>
<td>EFFCH</td>
<td>2.359</td>
<td>1.455</td>
<td>2.629</td>
<td>.877</td>
</tr>
<tr>
<td>CHLNAS</td>
<td>-.277</td>
<td>.064</td>
<td>18.628***</td>
<td>-.647</td>
</tr>
<tr>
<td>LIQUID</td>
<td>-.788</td>
<td>1.657</td>
<td>.226</td>
<td>-.083</td>
</tr>
<tr>
<td>ASCAP</td>
<td>-.091</td>
<td>.116</td>
<td>.603</td>
<td>-.151</td>
</tr>
<tr>
<td>LAGE</td>
<td>.129</td>
<td>.268</td>
<td>.231</td>
<td>.079</td>
</tr>
<tr>
<td>LASSET</td>
<td>.077</td>
<td>.261</td>
<td>.086</td>
<td>.055</td>
</tr>
<tr>
<td>UNEMP</td>
<td>.181</td>
<td>.188</td>
<td>.925</td>
<td>.176</td>
</tr>
<tr>
<td>HOLDC</td>
<td>-2LL = 53.30</td>
<td>.352</td>
<td>.696</td>
<td>.256</td>
</tr>
</tbody>
</table>

-2LL = 53.30  pseudo R² = .1274

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Regression Coefficient</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>-.776</td>
<td>.929</td>
<td>.698</td>
<td>-.272</td>
</tr>
<tr>
<td>ROACH</td>
<td>-.484</td>
<td>1.047</td>
<td>.214</td>
<td>-.107</td>
</tr>
<tr>
<td>EFF</td>
<td>-5.121</td>
<td>4.339</td>
<td>1.393</td>
<td>-.475</td>
</tr>
<tr>
<td>EFFCH</td>
<td>-1.055</td>
<td>3.699</td>
<td>.081</td>
<td>-.111</td>
</tr>
<tr>
<td>CHLNAS</td>
<td>-.054</td>
<td>.101</td>
<td>.281</td>
<td>-.106</td>
</tr>
<tr>
<td>LIQUID</td>
<td>-.215</td>
<td>1.955</td>
<td>.012</td>
<td>-.023</td>
</tr>
<tr>
<td>ASCAP</td>
<td>-.098</td>
<td>.161</td>
<td>.372</td>
<td>-.152</td>
</tr>
<tr>
<td>LAGE</td>
<td>-.229</td>
<td>.527</td>
<td>.190</td>
<td>-.094</td>
</tr>
<tr>
<td>LASSET</td>
<td>.523</td>
<td>.479</td>
<td>1.190</td>
<td>.258</td>
</tr>
<tr>
<td>UNEMP</td>
<td>.039</td>
<td>.257</td>
<td>.024</td>
<td>.037</td>
</tr>
<tr>
<td>HOLDC</td>
<td>-2LL = 4.98</td>
<td>-.507</td>
<td>.793</td>
<td>.138</td>
</tr>
</tbody>
</table>

-2LL = 4.98  pseudo R² = .0100

*  p < .10
**  p < .05
*** p < .01
Table 23. Results of Logistic Hierarchical Regression (n=859)

<table>
<thead>
<tr>
<th>Variables Included</th>
<th>Cumulative Pseudo-R²</th>
<th>Unstandardized Regression Coefficients</th>
<th>Wald Chi-Square for Individual Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change</td>
<td>.0100</td>
<td>1.1949</td>
<td>7.82***</td>
</tr>
<tr>
<td>Change</td>
<td>.0264</td>
<td>1.0853</td>
<td>6.31***</td>
</tr>
<tr>
<td>ROA</td>
<td>.0419</td>
<td>1.7402</td>
<td>5.06**</td>
</tr>
<tr>
<td>Change</td>
<td>.0101</td>
<td>1.1920</td>
<td>7.78***</td>
</tr>
<tr>
<td>ROACH</td>
<td>.0102</td>
<td>1.1873</td>
<td>7.70***</td>
</tr>
<tr>
<td>Change x ROACH</td>
<td>-.0003</td>
<td>.07</td>
<td>.07</td>
</tr>
<tr>
<td>Change</td>
<td>.0108</td>
<td>2.946</td>
<td>3.45*</td>
</tr>
<tr>
<td>EFF</td>
<td>.0104</td>
<td>1.903</td>
<td>7.75***</td>
</tr>
<tr>
<td>EFF</td>
<td>.0104</td>
<td>1.1867</td>
<td>7.67***</td>
</tr>
<tr>
<td>Change x EFF</td>
<td>-.0972</td>
<td>.13</td>
<td>.13</td>
</tr>
<tr>
<td>Change</td>
<td>.0104</td>
<td>1.3000</td>
<td>1.67</td>
</tr>
<tr>
<td>CHLNASBE</td>
<td>.0359</td>
<td>-.1751</td>
<td>19.53***</td>
</tr>
<tr>
<td>CHLNAS</td>
<td>.0523</td>
<td>.7869</td>
<td>2.86*</td>
</tr>
<tr>
<td>CHLNAS x CHLNASBE</td>
<td>.1340</td>
<td>.2045</td>
<td>19.50***</td>
</tr>
<tr>
<td>Change</td>
<td>.0103</td>
<td>1.2738</td>
<td>7.78***</td>
</tr>
<tr>
<td>LIQUID</td>
<td>.0104</td>
<td>1.2967</td>
<td>6.23**</td>
</tr>
<tr>
<td>Change x Liquid</td>
<td>-.2067</td>
<td>.5848</td>
<td>.21</td>
</tr>
</tbody>
</table>

(table con'd.)
<table>
<thead>
<tr>
<th>Variables Included</th>
<th>Pseudo-$R^2$</th>
<th>Unstandardized Regression Coefficients</th>
<th>Wald Chi-Square for Individual Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change</td>
<td>.0106</td>
<td>1.1458</td>
<td>7.01***</td>
</tr>
<tr>
<td>ASCAP</td>
<td>-.0478</td>
<td>.53</td>
<td></td>
</tr>
<tr>
<td>Change</td>
<td>.0108</td>
<td>1.1083</td>
<td>.35</td>
</tr>
<tr>
<td>ASCAP</td>
<td>-.0486</td>
<td>.39</td>
<td></td>
</tr>
<tr>
<td>Change $\times$ ASCAP</td>
<td>.0030</td>
<td>.00</td>
<td></td>
</tr>
<tr>
<td>Change</td>
<td>.0147</td>
<td>1.0221</td>
<td>5.35**</td>
</tr>
<tr>
<td>LAGE</td>
<td>.3142</td>
<td>3.32*</td>
<td></td>
</tr>
<tr>
<td>Change</td>
<td>.0176</td>
<td>2.4668</td>
<td>1.44</td>
</tr>
<tr>
<td>LAGE</td>
<td>.3770</td>
<td>3.93&quot;</td>
<td></td>
</tr>
<tr>
<td>Change $\times$ LAGE</td>
<td>-.3852</td>
<td>.54</td>
<td></td>
</tr>
<tr>
<td>Change</td>
<td>.0137</td>
<td>1.3368</td>
<td>9.50***</td>
</tr>
<tr>
<td>LASSET</td>
<td>.3098</td>
<td>2.75*</td>
<td></td>
</tr>
<tr>
<td>Change</td>
<td>.0138</td>
<td>-1.5903</td>
<td>.11</td>
</tr>
<tr>
<td>LASSET</td>
<td>.2527</td>
<td>1.53</td>
<td></td>
</tr>
<tr>
<td>Change $\times$ LASSET</td>
<td>.2941</td>
<td>.38</td>
<td></td>
</tr>
</tbody>
</table>

* $p < .10$
** $p < .05$
*** $p < .01$

models for each moderator. One contained the change variable, one contained the change variable and a moderator, and the final one contained the change variable, the moderator, and an interaction term. A significant improvement in overall fit when adding the interaction term, as calculated by the logistic procedure, indicates a significant moderating effect.

Important assumptions for the logit model are linearity of the relationships, the absence of autocorrelation, and no exact or near linear dependencies among...
the independent variables; i.e., severe multicollinearity (Aldrich and Nelson, 1984). Unfortunately, there are few diagnostics available to detect these problems, and even when detected, there is little guidance in the literature as to how they can be remedied. The regression diagnostics and correlation tables from the previous analysis suggest that severe multicollinearity is not a problem in the straight logit models. Multicollinearity is typically a problem with hierarchical analysis; however, the overall test of fit is not affected by this problem. Also, it has been shown that auto-correlation is not a problem as long as sample sizes are large (Robinson, 1982). Thus, we can assume that the models provided unbiased estimates.

Results

An examination of Table 23 reveals that no significant interactions were observed. In addition, Table 22 shows that none of the relationships were in the hypothesized direction. In fact, the only significant predictors were ROA, change in ROA, and change in loans to assets. Each of these performance indicators were positively related to survival for firms that changed strategies. This is counter to the hypothesis that suggested a negative relationship between performance and survival for firms that change strategies. Thus, no support was provided for any of the hypotheses concerning the moderating variables and survival outcomes.
Once again, it was interesting to note that change alone had a highly significant and positive effect on survival (see Table 23). Approximately 58% of the surviving firms changed strategy, compared to 29% of those that failed. In other words, changing strategies appeared to have survival value, rather than increase chances of failure. A chi-square test of homogeneity was performed to shed more light on this relationship, and the results are shown in Table 24.

Table 24. Chi-Square Test - Change and Survival Data

<table>
<thead>
<tr>
<th></th>
<th>No Change</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Failed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observed</td>
<td>19</td>
<td>8</td>
</tr>
<tr>
<td>Estimated</td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td>Residuals</td>
<td>2.41</td>
<td>2.00</td>
</tr>
<tr>
<td>Survived</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Observed</td>
<td>326</td>
<td>471</td>
</tr>
<tr>
<td>Estimated</td>
<td>334</td>
<td>463</td>
</tr>
<tr>
<td>Residuals</td>
<td>.437</td>
<td>.372</td>
</tr>
</tbody>
</table>

Chi-Square = 9.317
Probability = .002

The chi-square value is significant (p=.002), and the residuals for the failed firms indicate that those two cells contributed to the significant chi-square value. As can be seen, there were significantly fewer failures than expected in the change group, and significantly more
failures than expected in the no change group. This strongly supports the strategic management perspective and seems to run counter to the selection arguments proposed by the population ecologists.

Degree of Change and Survival

Hypothesis 10 predicts that degree of change will be negatively related to survival. Change to less similar groups, presumably entails greater investment in resources; i.e., the greater the change, the higher the mobility barriers. Furthermore, many of the resources necessary to compete in new markets may not be readily available in factor markets (Barney, 1991). The failure to acquire necessary resources for competing in new groups places an organization at a disadvantage to its competitors, thus decreasing its chances of survival.

Results of the logit model used to test this hypothesis are displayed in Table 25. The first logit model used only firms that changed strategies; however, this model failed to achieve significance (pseudo-$R^2 = .0018$). A second model was analyzed that included all firms. This model revealed a significant and positive relationship between degree of change and survival, however these results must be interpreted with caution. It has been demonstrated that degree of change is distributed in a bi-modal fashion between firms that changed and those that did not. Also, very few firms that changed strategies
Table 25. Results of Logistic Regression Analyses with Degree of Change as the Independent Variable

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Regression Coefficient</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>Change in Strategy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DCHNG</td>
<td>-.079</td>
<td>.590</td>
<td>.018</td>
<td>-.025</td>
</tr>
<tr>
<td>HOLDC</td>
<td>-.210</td>
<td>.735</td>
<td>.082</td>
<td>-.057</td>
</tr>
<tr>
<td>UNEMP</td>
<td>.189</td>
<td>.248</td>
<td>.586</td>
<td>.176</td>
</tr>
</tbody>
</table>

-2LL = .900 pseudo-R² = .0018 n=492

Full Sample

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Regression Coefficient</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>DCHNG</td>
<td>.392</td>
<td>.143</td>
<td>7.518***</td>
<td>.332</td>
</tr>
<tr>
<td>HOLDC</td>
<td>.052</td>
<td>.396</td>
<td>.017</td>
<td>.014</td>
</tr>
<tr>
<td>UNEMP</td>
<td>.189</td>
<td>.128</td>
<td>2.157</td>
<td>.179</td>
</tr>
</tbody>
</table>

-2LL = 10.054 pseudo-R² = .0116 n=857

* p < .10
** p < .05
*** p < .01

failed (8 out of 492). The limited sample, combined with the distribution of the data, suggest that the results be interpreted as a change/no change relationship rather than a degree of change relationship. Thus, these findings probably just reinforce the finding that change is positively related to survival. The results concerning degree of change and survival can only be said to be inconclusive.
Analysis of the change/survival relationships revealed no support for the hypothesized relationships. None of the proposed moderators were significant, and the results concerning degree of change were inconclusive at best. An important issue in this analysis, however, is the relatively small sample of failed banks. Although logit analysis does not require an even sample (Aldrich and Nelson, 1984), recent research suggests that detection of moderating effects of dichotomous variables can be seriously undermined by uneven sample sizes. Stone-Romero, Alliger, and Aguinis (1994) used a Monte Carlo simulation to show that the power to detect moderating effects diminishes significantly as the proportion of cases in each group becomes greater, even when sample size is large. These findings indicate that the inference of no moderating effect in this study may be erroneous. The results may be due to low statistical power rather than the absence of a moderating effect.

One interesting outcome of the logit analysis, was the finding that the failure rates were significantly higher for banks that failed to change than for banks that changed strategies. This would appear to provide rather strong evidence in support of the strategic management perspective. For this particular sample, it could be argued that strategic change served to enhance, rather than
reduce survival rates. At least during the time frame of this study, the selection arguments are not supported.

Summary

This chapter reported the results of the classification efforts and statistical tests of the hypotheses. The cluster analysis was successful at identifying five strategic groups that were distinct and easy to interpret. The groups were used to measure strategic change. Distinct patterns of change were detected. Both the strategic groups, and the patterns of change made sense and were consistent with previous studies that have examined these issues. The results of the cluster analysis were used to test hypotheses concerning the antecedents and outcomes of strategic change. A summary of the hypotheses and results of the analysis are provided in Table 26. In addition, since a number of the more interesting findings in this study were not hypothesized, Table 27 includes a summary of some of the more interesting results.

Summary of Change Antecedents

Prior performance, slack resources, and organizational age were all found to be significant predictors of strategic change, but not always in the direction predicted. A decline in loans as a percentage of assets was found to be significantly related to change. Other performance measures such as ROA and efficiency were not
<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Support</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Performance</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H1 Prior performance is negatively related to change.</td>
<td>Mixed</td>
<td>Supported for effectiveness measures, but not efficiency of financial performance measures.</td>
</tr>
<tr>
<td>H2 Strategic change and prior performance covary negatively with respect to subsequent performance and survival.</td>
<td>Not Supported</td>
<td>No significance</td>
</tr>
<tr>
<td><strong>Slack</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H3 Slack resources are positively related to change.</td>
<td>Mixed</td>
<td>Supported for asset to capital measure, but not liquidity measure.</td>
</tr>
<tr>
<td>H4 Strategic change and slack resources covary positively with respect to performance and survival.</td>
<td>Not Supported</td>
<td>Liquidity and change covaried negatively with respect to ROA.</td>
</tr>
<tr>
<td><strong>Age</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H5 Organizational age is negatively related to change.</td>
<td>Not Supported</td>
<td>Relationship was significant, but in the opposite direction.</td>
</tr>
<tr>
<td>H6 Age and strategic change covary negatively with respect to performance and survival.</td>
<td>Mixed</td>
<td>Age and change covaried negatively with respect to effectiveness.</td>
</tr>
</tbody>
</table>

(table con'd.)
<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Support</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Size</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H7 Size is negatively related to change.</td>
<td>Not Supported</td>
<td>Relationship was insignificant when original strategies were entered into the equation.</td>
</tr>
<tr>
<td>H8 Size and strategic change covary negatively with respect to subsequent performance.</td>
<td>Not Supported</td>
<td>No significance</td>
</tr>
<tr>
<td>H9 Size is positively related to survival.</td>
<td>Not Supported</td>
<td>No significance</td>
</tr>
<tr>
<td><strong>Degree of Change</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H10 Degree of change is negatively related to survival.</td>
<td>Not Supported</td>
<td>Change alone was found to be positively related to survival.</td>
</tr>
<tr>
<td>H11 Degree of change is positively related to performance for survivors.</td>
<td>Mixed</td>
<td>Change and performance were found to have a curvilinear relationship.</td>
</tr>
</tbody>
</table>
Table 27. Important Findings Not Hypothesized

1) Change was not uncommon and patterns of change observed suggest a relationship between scope and change.

2) Liquid resources and age were both significantly related to change, but in the opposite direction from that predicted.

3) Size became an insignificant predictor of change when original strategy was entered into the equation.

4) Change was positively related to both performance and survival.

5) Change was found to be related to performance in a curvilinear manner.

significant predictors of change. Given that loans/assets is an indicator of strategic effectiveness for banks, this finding seems appropriate. Strategic management theorists have advocated that strategic change is necessary in response to a loss of effectiveness; i.e., a lack of fit with the environment.

Slack resources had mixed effects on strategic change. Liquid assets were found to have a negative influence on strategic change, while capital was positively related to change. One explanation may be that liquidity measures are tapping into another construct, risk posture. High levels of liquidity also indicate a tendency toward risk aversion in the banking industry. Thus, it is not too surprising that high levels liquidity are negatively related to change. High levels of capital, apparently encourage banks to change strategies due to the cushion provided.
Age was a particularly strong and robust predictor of change, but the direction of the influence was in the opposite direction from that predicted. Older organizations, contrary to the propositions of selection theorists, demonstrated a higher propensity to change. It was suggested that this finding may reflect a learning effect. As organizations grow older and experience environmental changes, they may learn how to become flexible and responsive.

As predicted, size was found to be negatively related to change. However, when controlling for original strategy, this effect became insignificant. Thus, the size effect was assumed to be spurious.

Summary of Performance Outcomes

This section tested the notion that certain factors may moderate the relationship between change and performance outcomes. Age, slack resources, and degree of change were all found to have a significant influence on performance outcomes. Age was a weak moderator for changes in loan portfolio growth, but not for ROA or efficiency. Furthermore, the direction of the relationship supported the hypothesis. Age was negatively related to performance (effectiveness) for firms that changed strategies, but was positively related for organizations that failed to change strategies. Though hypothesized, this relationship is surprising, given the findings that age was positively
related to change. Apparently older organizations are more prone to attempt change, but have more difficulty in the implementation.

Slack resources in the form of liquidity were also found to moderate performance outcomes. Surprisingly, slack was negatively related to performance for organizations that changed strategies. It was suggested that either a buffering or risk aversion may explain this relationship. Since liquidity was found to deter change, it is possible that when change is attempted, the timing or degree of change may affect subsequent performance. In other words, the change may be "too little" or "too late" or a combination of the two.

Degree of change was found to be negatively related to ROA outcomes. For organizations that changed strategies, more radical changes were associated with lower performance outcomes. On the other hand, change itself was found to be positively related to performance, particularly when the more radical changers were eliminated from the sample. This finding strongly suggests that change can positively impact performance, but that too much change can have a detrimental result.

Summary of Survival Outcomes

This section tested the hypotheses predicting survival outcomes. None of the hypotheses were supported. This was assumed to be partially due to the small number of failed
firms in the sample, and the resulting lack of statistical power. One finding of note was that survival was found to be positively related to change. Over 58% of the surviving firms changed strategies, while only 29% of the failed firms changed. Thus, changing strategies appeared to decrease rather than increase chances of survival.

In conclusion, although the hypotheses received mixed support, many of the findings were interesting. The outcomes provided support for many of the basic strategic management tenets. Change was found to be a rather common occurrence, and in general the results point to positive change outcomes.
CHAPTER 7
DISCUSSION AND CONCLUSIONS

This chapter reviews the findings and conclusions of the study. The first section contains an overview of the study and findings. The ensuing discussion will include an examination of the contributions and limitations of the study, as well as its implications for theory, management practice, and future research.

Overview of the Study

This study started out by proposing three questions that are fundamental to the strategic management perspective, but have received relatively little attention by researchers. The first two questions were:
1. Do organizations engage in strategic change following environmental discontinuities?
2. Do those organizations that change strategies following major environmental discontinuities improve their performance and survival chances?

Based on the theoretical and empirical research to date, it was anticipated that the answer to these questions is, "it all depends." Therefore, the focus of this study was placed on exploring a third question:
3. To what extent is the relationship between change in strategy, performance, and survival influenced by firm and situation specific factors?

Based on a review of the literature, a conceptual model was developed that predicted change would be influenced by two factors, adaptive forces and inertial forces. Adaptive forces include two factors that have been hypothesized to encourage change, prior performance and slack resources. Inertial forces include two factors sometimes thought to hamper change, organizational size and age. Change outcome was predicted to be influenced by degree of change and moderated by the adaptive and inertial forces. Guided by previous theoretical and empirical research, cluster analysis was used to measure strategy and degree of change. The conceptual model was tested within the context of the commercial banking industry from 1980 to 1987.

Data analysis suggested a number of interesting conclusions. First, the cluster analysis revealed that over half (57%) of the banks in the sample changed strategies during the time of the study. This finding is roughly consistent with percentages observed in previous studies that have examined strategic change in industries undergoing discontinuous change. Certain patterns of change also emerged. For example, there was a strong movement away from the agricultural lending and retail...
segments, and a strong movement toward investments. Firms following strategies that were broader in scope demonstrated relatively less change than those following more focused strategies. These results are consistent with the ecological arguments that generalists are better suited to withstand major environmental discontinuities (Freeman and Hannan, 1983). However, the fact that the narrower scope firms were able to shift to a different strategy obviously supports the strategic management perspective.

In general, this study joins a growing number of studies that suggest strategic change is a rather common event following major environmental discontinuities. Thus, as expected, this study offers an affirmative answer to the first research question posed. Organizations do tend to engage in strategic change following major environmental changes. Furthermore, the pattern of changes noted suggest that the initial strategy seems to be an important determinant of change. Narrower scope firms in particular seem to be in a more precarious position following environmental changes, as evidenced by the larger number of changes noted among these groups. This observation suggests an area for further research.

Second, the conceptual model proved to be useful in understanding the relationship between certain firm level factors and the propensity of organizations to change strategies. Some evidence was found to support the notion
that prior performance, slack resources, and age are all important antecedents to change. Effectiveness, as measured by loan portfolio growth, was found to be negatively related to change. That is, banks experiencing a decline in their loan portfolios, relative to overall assets, experienced a greater degree of strategic change. On the other hand, efficiency and overall financial performance were not significantly related to change. This finding rather strongly supports the strategic management framework, particularly the position that stresses the inertial characteristics of organizations.

Slack resources in the form of excess capital, were found to have a positive influence on degree of change. This supports the notion that an excess cushion of resources can act as an adaptive force, encouraging change and experimentation. On the other hand, liquidity was negatively associated with change; however, this relationship may be indicative of an overall aversion to risk. One particularly interesting and unexpected result was the finding that age was positively related to change. A learning effect was offered as an explanation, but this result suggests the need for further research.

The overall picture that emerges from these findings is that declining effectiveness and slack resources act as adaptive forces; i.e., they encourage strategic change as predicted. However age and size failed to inhibit change
as predicted. In fact, age was found to be a positive force for change. In addition, though not a part of the model, the results suggest that risk aversion and group membership may be important factors that influence change.

Third, this study suggests that change is positively related to performance and survival, regardless of firm level factors suggested in the model. Change was noted to be positively related to ROA, efficiency, and survival. Significance was weak for ROA, moderate for efficiency, and strong for survival. This finding was unexpected, given that few studies have found a significant main effect relationship between change and performance. The improvement in efficiency was particularly interesting, in light of the liability of newness arguments proposed by population ecologists. Apparently a number of banks were able to successfully implement strategic changes, while simultaneously improving efficiency. Also, it was interesting to note that change appeared to have survival value. This set of findings is interpreted as offering rather strong support for the strategic management perspective.

Fourth, the relationship between change and performance becomes even more clear when degree of change is considered. Specifically, the evidence suggests a curvilinear relationship between performance and change. Firms that underwent moderate levels of change outperformed
those that did not change as well as those that underwent a more drastic degree of change. Interestingly, this finding is similar to that of Hambrick and D'Aveni (1988), who found that too little or too much change was associated with organizational failure. Although change can have positive outcomes, organizations must find the right balance when attempting strategic change. Changing too much may be just as detrimental as not changing, even when environmental circumstances dictate the need for change.

Finally, a few firm level factors, age and slack resources (liquidity) were found to moderate the relationship between change and performance. Specifically, high levels of liquidity were negatively related to performance (ROA) for firms that changed strategies and positively related for firms that failed to change. Since liquidity is generally thought to aid in the implementation of new strategies, this finding may reflect an indirect relationship. For example, high levels of liquidity may reflect a risk averse posture, resulting in a conservative or tenuous approach to change. Either through the timing of the change or the degree of change, such an approach may have a negative impact on performance. Age was a weakly significant moderator of the change-effectiveness relationship. Older organizations apparently have a more difficult time implementing changes, despite being more prone to attempt change.
In summary, the findings provided some support for the conceptual model, although revisions are apparently in order. For example, factors such as group membership and risk posture may be important change antecedents to consider. Also, a quite important finding was that degree of change seems to be related to performance in a curvilinear fashion. Overall, these findings lend credence to the major assumptions of the strategic management perspective and have some important implications for practicing managers as well. These issues will be addressed in the following sections.

Conclusions and Contributions of the Study

The conclusions and contributions of this study will be examined by reviewing the individual components of the model and evaluating the outcomes in light of the theory used to develop the hypotheses.

Performance and Strategic Change

The literature suggested that there would be a relationship between performance and strategic change. First, a number of theorists advocate an inertial view of strategic change (Oster, 1982; Miller and Friesen, 1984). The implication of this view is that change will tend to be delayed until an obvious gap develops between desired and actual performance. Low or declining performance will tend to provide an incentive for change to occur. The evidence from this study lends credence to this view, but also
suggests that managers may be more sensitive to certain types of performance. In this study, banks tended to change strategies in response to a decline in loans to assets, a measure intended to capture overall effectiveness. Since effectiveness is more closely associated with strategic "fit", this finding seems appropriate. A drop in loans, which are typically the primary earning assets for a bank, is likely to be the first internal indication of the need to seek out new markets. On the other hand, a decline in overall financial performance may be a function of efficiency problems, or perhaps, uncontrollable but temporary economic conditions such as changes in interest rates. Thus, the banks in this study seemed to respond to specific performance signals. Also, none of the static measures of performance were significant, indicating that managers are more sensitive to changes in their own performance, rather than performance relative to competitors.

Second, given the difficulties associated with changes of a strategic nature asserted by the population ecologists as well as many strategic management theorists, it was reasoned that such changes will be beneficial only for those organizations demonstrating a strong need for change. Theoretically, these organizations will be more motivated to implement the change, and will stand to gain more from the change. In essence, the gains for these organizations
are expected to outweigh the costs. However, change is likely to be detrimental for those demonstrating little need for change. Here, the costs are likely to outweigh the gains. Need for change was assumed to be closely related to performance; therefore, it was reasoned that prior performance would moderate change outcomes. Unfortunately, none of the prior performance measures significantly moderated performance or survival outcomes; therefore, this study provides no evidence to support this view.

Obviously, this lack of evidence could indicate that need for change and change outcomes are unrelated; however, there are other explanations as well. For example, these findings may simply reflect an imperfect correlation between performance and need for change. Although a decline in loans to assets was related to change above, this explains only a small percentage of the variance in change. Changes may also be triggered by external events that increase aspiration levels (Grinyer and McKiernan, 1990), such as threat of a takeover or change in the competitive environment or by internal events such as change in management. Under such circumstances, organizations may recognize the need for change, prior to experiencing a decline in performance.
Slack Resources and Strategic Change

Researchers disagree as to how slack resources will impact organizational change. Some argue that excess resources will encourage organizations to experiment and take a more proactive approach to change (Bourgeois, 1981; Cyert and March, 1963). Others argue that slack resources will discourage change by buffering the organization from its environment (Starbuck, Greve, and Hedberg, 1988). At first glance, the results of this study appear to support both views, since two different measures of slack were significant in opposite directions. Liquidity was found to be negatively related to change, supporting the buffering argument. On the other hand, capital was positively related to change, supporting the experimentation argument.

One explanation offered in this study is that liquidity may be tapping into a related construct, risk posture. Liquid resources, consisting of cash and investments that can be quickly converted to cash, are a first line of defense for banks in case of a deposit "run-off." In the event of a large decline in deposits, liquid resources can be depleted rather quickly. However, most banks have a number of options, including loans from other banks (fed funds), loans from the government agencies, or simply "bought money" (i.e., high interest rate, large denomination C.D.'s). Investments in cash or liquid resources offer clearly lower returns for banks, but they
also lower the risk of having to rely on more expensive funds in the event of a decline in deposits. Thus, substantial investment in liquid resources can be interpreted as a tendency toward risk aversion.

In retrospect, liquid resources are perhaps not a very crucial source of slack for banks. For one thing, banks have a number of available funding alternatives designed to protect them from short term cash shortfalls, since such shortfalls can have disastrous consequences. Also, considering that they offer little protection against loan losses, the notion that high levels of liquidity discourage banks from monitoring and reacting to their environment does not seem to be an extremely plausible explanation. Thus, the most reasonable explanation for these results is that liquid resources represent a measure of risk posture. High levels of liquid resources represent an aversion to risk, and thus reduce the likelihood of change.

On the other hand, capital reserves represent a primary line of defense against unanticipated loan losses. Unanticipated loan losses, those that exceed loan loss reserves, go directly to the "bottom line", thereby reducing capital. Marginal capital reserves can be depleted rather quickly in the event of large investment or loan losses, forcing a bank into insolvency. It is apparent that excess capital represents an important cushion for banks moving into less familiar lending
territory where unexpected losses may occur. Therefore, the finding that capital reserves are positively related to change supports the view that slack resources encourage change and experimentation.

It was also anticipated that slack resources would moderate change outcomes by positively impacting performance and survival. The reasoning is that slack resources provide a cushion of resources that could be utilized during the reorganization process following change. Liquidity was found to moderate the change process, but in the opposite direction from that predicted. For organizations that changed strategies, liquidity was found to be negatively related to performance. However, if liquidity is an indicator of risk posture as suggested above, these results do not seem surprising. Conservative organizations, when they do make changes, may go about it in more tenuous fashion. Attempting to change in a "piecemeal" fashion or delaying change and entering new markets after the competition may hamper performance, even when change is called for.

Organizational Age and Strategic Change

Hannan and Freeman (1984) make a strong argument for a correlation between age and inertia. As organizations age, certain routines and skills become embedded. Having an established set of routines is said to increase accountability and reliability, and thus improve an
organization's chances of survival. Supposedly, the price paid for accountability and reliability is loss of flexibility. This notion suggests a negative relationship between age and change. However, the results of this study indicate that this line of reasoning may be erroneous. Age was found to positively related to change. That is, older banks in this study were more likely to change strategies than younger banks. It was suggested that this result may be due to a learning effect. As organizations age and survive environmental upheavals, it is likely that one of the skills they master is the ability to adapt.

The population ecology arguments also suggest that organizational age may moderate the relationship between change and performance outcomes. Since younger organizations are supposedly more flexible, they should have an advantage over older organizations when changing strategies. On the other hand, the liability of newness argument suggests that older organizations may have an advantage under conditions of stability. This study provides some evidence to support this line of reasoning. Age weakly moderated the relationship between change and loan portfolio growth in the direction expected. That is, age was negatively related to portfolio growth for banks that changed strategies, but was positively related for firms that did not change. Though hypothesized, this result was surprising since age was found to be positively
related to change. This finding suggests a more complex relationship than a straight-forward learning argument. Apparently, the experience gained by older banks translates into superior environmental scanning skills, allowing them to recognize the need for change. Thus, older banks are more likely to initiate change. However, this does not translate into superior implementation skills. Inertial forces apparently serve to slow down or hamper change efforts in these organizations, resulting in a failure to achieve the full benefits of the change. Thus, older banks were more prone to change strategies, but were less able to implement certain aspects of the change.

The findings concerning age were surprising. In fact, a fair amount of additional analysis was performed to rule out alternate explanations, but the relationship proved to be quite robust. The only other study to directly examine the influence of age on change found that age was positively related to the length of time taken to implement changes (Ginsberg and Bucholtz, 1990). That finding agrees with the result in this study that age may negatively impact certain performance outcomes. However, neither of these seem consistent with the finding that age is positively related to change. Our post-hoc explanation that relates age to learning seems plausible, but there is obviously a need for further theoretical and empirical exploration of this phenomenon.
Organizational Size and Strategic Change

Larger organizations are frequently argued to have greater inertial qualities than small organizations (Hannan and Freeman, 1984; 1989; Fombrum and Ginsberg, 1990). The arguments suggest that the standardization and formalization associated with large, complex organizations make them less amenable to the will of managers and less flexible. This study provides no support for this position. Size was found to be negatively related to change; however, when controlling for original group membership this effect became insignificant. Size also failed to moderate performance and survival outcomes. When controlling for original group membership, large banks in this study were just as likely to change strategy and were able to implement strategies as effectively as smaller ones.

This finding contradicts a number of studies that have found size to be a significant inhibitor of change (Fombrun and Ginsberg, 1990; Guarino, 1991; Rediker and Middleton, 1992; Silverman and Castaldi, 1992). It is interesting to note, however, that all but one of these studies have occurred in the banking industry, and none controlled for original group membership. This study suggests an alternate explanation to the size/inertia argument typically offered. The patterns of change noted in this study suggested a relationship between scope and strategic
change. Organizations with narrower scopes tended to exhibit a greater degree of change than those with a wide scope. Because scope is generally related to size, it may be argued that relationships between size and change, actually represent a relationship between scope and change. Larger, broad scope, firms are likely to have less need for change during times of environmental discontinuities (Zammuto and Cameron, 1985). Therefore, the relationship noted by previous researchers between size and change may be spurious.

**Degree of Change and Change Outcomes**

Both population ecologists and strategic management theorists have argued that the type, or degree, of change is an important consideration when hypothesizing change outcomes. The population ecologists are obviously much more restrictive, arguing that organizational core features, including domain and technology, are highly inert and can rarely be successfully changed. Strategic management theorists, on the other hand, stress that mobility barriers may restrict certain types of changes. Generally speaking, the more similar the groups, the lower the mobility barriers, and the easier the change. As suggested by Harrigan (1985), this study used distance between groups, to measure degree of change. The greater the distance or degree of change, the higher the mobility barriers. The results suggest that change is related to
performance outcomes in a curvilinear fashion. Organizations that engaged in moderate levels of change experienced superior performance compared to those that experienced no change, or extreme levels of change. This outcome provides more support for the strategic management perspective than for population ecology.

Limitations of the Study

One important limitation to any study focusing on a single industry is that of generalizability. This study focused on a single industry, at a particularly turbulent time in its history. Different findings may be obtained by examining different industries under different environmental circumstances, or even by examining the same industry at a different time in its history. Therefore, caution must be exercised when generalizing these results to other industry sectors. Nevertheless, the loss of generalizability was offset by a greater depth of understanding associated with examining changes occurring within a single industry. As more researchers take this approach, generalizability can be assessed by comparing results obtained in numerous industries over different points in time.

A second limitation of this study lies in its design. Care was taken to choose an appropriate time frame, one that would capture changes in the industry following deregulation, and one that would be long enough for the
changes to materialize. However, as with any study of this type, the exact times for measuring strategy and performance were somewhat arbitrary. It is likely that some of the firms in the sample changed strategies prior to 1982 or after 1985, thus distorting the results. Also, the design did not allow for determining the exact timing of the change. Therefore, prior and post performance measures can only be said to be approximate.

Another limitation related to the time frame issue, was the failure to include a large enough sample of failed banks to adequately test the hypotheses related to survival. Two ways to increase the sample of failed banks would be to extend the time frame of the study or to develop a matched set of failed and surviving banks. The most methodologically desirable approach would be to extend the time frame of the study, using the same randomly drawn sample. However, there is no guarantee that this approach would sufficiently increase the sample of failed banks. Also, the further removed the failure from the measurement of change, the weaker the linkage becomes. Therefore, future studies to examine this issue may need to used matched sets of failed and surviving organizations.

Another time frame limitation concerns the overall length of the study. Although the study is longitudinal, covering an eight year time frame, it still may be argued to be relatively short from the perspective of population
ecologists. For example, Hannan and Freeman (1977) go back literally hundreds of years in their attempt to argue that even the largest organizations eventually fail. While one could certainly argue the merits of taking such a long term perspective, it does point out that the time frame for this study may be considered too short to be meaningful from the selection perspective.

A fourth limitation is the choice of strategy variables. Choices pertaining to scope (i.e., products offered and markets served) represents an important strategic consideration. A number of studies, both in the population ecology and strategic management literature have relied on similar variables to measure strategy. Nevertheless, this definition of strategy may result in specification error. For example, this study fails to consider other important strategic components such as competitive weapons and segmentation (Chrisman, Hofer, and Boulton, 1988). In addition, the measures used may fail to capture more subtle changes in scope. For example, an organization switching its focus from large commercial lending to small business loans, would still be classified as a wholesale lender in this study. Failure to capture such changes represents specification error, which could distort the results.

A final limitation of this study results from the assumptions and judgement calls associated with doing a
cluster analysis. Cluster analysis may be seriously impacted by the variables included in the analysis and the clustering algorithm used. As noted, an attempt was made to choose appropriate variables, and the non-hierarchical algorithm associated with the FASTCLUS procedure had quite a bit of precedence in the literature. Nevertheless, the inclusion or deletion of certain variables or the use of a different clustering method may have resulted in significantly different results. Also, though the five cluster solution seemed to be superior, the number of clusters chosen is ultimately a subjective decision that can impact the results.

Implications for Theory

This study drew on the theories of population ecology and strategic management to investigate strategic change in the banking industry. Population ecologists argue that inertial forces largely preclude change to the core features of an organization (Hannan and Freeman, 1977; 1984). Furthermore, when changes are attempted, they will tend to be disruptive and maladaptive resulting in an increased risk of failure. On the other hand, the strategic management approach suggests that managers have considerable latitude in altering competitive strategies, and that such alterations are sometimes necessary to ensure continued survival. The literature suggested that taking a middle-ground approach to investigating strategic change
would result in a better understanding of the phenomenon. That is, the degree to which strategic choice and selection arguments are salient may depend on certain firm level factors.

Overall, this study provides little evidence to support the natural selection view of strategic change. First, changes between strategic groups was not an uncommon occurrence for banks during the time of this study. Approximately 57% of the banks in this study changed group membership. Second, banks that changed strategies improved their performance relative to those that did not. The curvilinear relationship noted between degree of change and performance suggests limitations to change. Such limitations could be argued to contradict the extreme views of strategic choice assumed by some schools of thought within the strategic management paradigm; however, this view is consistent with the main stream view that assumes choice to be limited by mobility barriers. The extreme selection view argues that any change to core features will have a detrimental impact on performance. Third, failure rates were significantly higher for banks that did not change strategies than for those that changed strategies. Contrary to the selection arguments, change seemed to associated with survival. Fourth, although age and size have been hypothesized to be positively related to inertia, neither seemed to significantly hamper change efforts. In
fact, older banks were more prone to engage in strategic change than younger banks. Size was found to have no impact on change, when group membership was controlled. These findings indicate that the natural selection arguments need some revision.

In general, this study suggests that managers have quite a bit of discretion in altering their strategies in response to environmental changes. However, the evidence that certain aspects of prior performance were significant antecedents to change supports the notion that strategies tend to be "sticky" (Oster, 1982). Banks in this study appeared to need a performance downturn to stimulate change. Also, there appear to be limitations to change. At some point, the costs of changing apparently outweigh the benefits, resulting in performance downturns. Thus, although managers have strategic choice, not all changes are easy to implement, or are they likely to have positive outcomes.

In some ways, the results of this study are in keeping with a growing body of literature suggesting that the natural selection view and strategic management perspective be reconciled by considering the type or degree of change considered (House, Singh, and Tucker, 1986; Haveman, 199; Bauerschmidt and Chrisman, 1993). Selection theorists have made the distinction between core and peripheral changes, however this study suggest that a finer distinction be
considered. Within the core features, which include stated goals, forms of authority, core technology, and marketing strategy, it may be necessary to consider degree of change. Perhaps as changes become more unrelated, requiring old competencies to be discarded and new ones developed, the selection view becomes more salient.

Implications for Management Practice

As noted above, this study indicates that managers have a great deal of discretion in changing strategies, but this does not mean that all types of changes work, or that change is an easy process. When environmental upheavals change the face of competition, and make certain niches more or less desirable, managers should seek to respond by changing strategies. On average, organizations that changed strategies outperformed those that did not in this study.

The role of degree of change in this study suggests that managers carefully weigh the various mobility barriers prior to undergoing changes. Changes that are highly dissimilar to existing strategies may require the development of new competencies that are not readily available, or that are quite costly. In all probability, this explains the popularity of the change to a focused investor orientation during the time of this study, as an investment strategy may be argued to require less specialized skills than other strategies. Organizations

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attempting to overcome high mobility barriers are likely to find themselves at a disadvantage relative to their competitors. This study suggests that mobility barriers play an important role in the outcome of strategic change. Changes to relatively similar positions are more likely to result in positive outcomes.

Contrary to the findings of previous studies, this research suggests that age and size have relatively little impact on change outcomes. There is some evidence to suggest that older organizations were more prone to change strategies, but that they experienced somewhat lower performance. However, overall the results seem to indicate that older and larger banks experienced little more difficulty in changing strategies than smaller, younger banks. Managers of large or older organizations should not consider these factors as barriers when attempting to change strategies.

Implications for Future Research

The results of this study indicate a number of directions for future research. First, the results suggest that future studies should examine the impact of scope on change and change outcomes. Though not hypothesized, an interesting outcome from this study was that size became insignificant when original group membership was entered into the equation. This finding challenges a number of studies that have found size to be a significant inhibitor.
of change (Fombrun and Ginsberg, 1990; Guarino, 1991; Rediker and Middleton, 1992; Silverman and Castaldi, 1992). Specifically, it implies that organizational strategy, as measured by scope, is a more important change antecedent than size. The patterns of change noted in this study suggest that banks following focused strategies (narrow scopes) tended to change more frequently than banks following generalist strategies (broad scopes). This finding is consistent with the notion that broad scoped firms are better suited to weather environmental discontinuities due to their diversity (Zammuto and Cameron, 1985). It also suggests an alternate hypothesis to the size/inertia argument typically offered. A related issue that deserves exploration concerns the impact of scope on change outcomes. In general, this study indicates that scope could be an important variable for understanding strategic change, which in turn suggests the need for further theoretical development and empirical research in this area.

A more obvious, but seldom considered factor that is likely to impact change and change outcomes is a firm's overall disposition toward risk. This study found that liquid resources were negatively related to change and performance. Since larger levels of liquid resources are seen as an indicator of risk aversion, these findings suggest that risk posture may be an important variable for
predicting both change and change outcomes. Further research is needed to explore this issue.

An unexpected finding in this study that deserves further exploration is the positive relationship found between age and change, and subsequent negative relationship between age and change outcomes. Post-hoc reflection suggested that this may be due to learning effects, or scanning experience in the industry, but this explanation needs to be further developed and tested.

Another interesting relationship that could bear further exploration is that between degree of change and performance. Although the findings relating cluster distance to performance outcomes are interesting in their own right, further studies may want to explore this relationship in more depth. For example, can the concept of "relatedness" be used to better understand this phenomenon? Also, the concept of asymmetric mobility barriers may be an interesting phenomenon to explore (Harrigan, 1985). That is, the success in moving between groups may depend not only on the degree of change, but the direction of change. For example, in this study 53 firms moved from a generalist wholesale strategy to a focused investment strategy, while only eight firms changed from focused investors to generalist wholesalers. Although the distance traveled remains the same, intuitively moving toward an investment strategy would seem to be much easier
than the reverse. The notion of asymmetric mobility barriers seems to be borne out by the patterns of change noted in this study, but further research may want to explicitly test this notion by accounting for direction of change when testing change outcomes.

In addition to the above, a number of suggestions for future research can be made to overcome the limitations of this study. For example, replications using different industries, different strategy variables, and different methods would be useful. As evidence accumulates in this manner, a core group of generalizable conclusions can be amassed.

It would also be useful to extend this study, measuring strategic change over multiple time periods. Several interesting questions could be explored by such an extension. For example, did firms that switched to an investment strategy switch again as the industry settled down and became more predictable? More specifically, did a change to an investment strategy represent a stepping stone to more drastic change, or perhaps a safe port to ride out the turbulence in the industry? In general, this pertains to the whole issue of incremental versus quantum change. Although this study suggests that quantum changes are less likely to be successful, perhaps organizations achieve such change incrementally, making a series of smaller changes
over time, or changing to a "safe" strategy while they accumulate the skills necessary to make major changes.

Another important area for future research is the focus on strategic change and failure. As noted, this study failed to capture a large enough sample of failed banks to test the hypotheses related to survival. This could be dealt with in several ways. First, the time frame of the study could be extended to increase the number of failures. Another approach would be to develop a matched set of failed and surviving banks for comparison. A final approach would involve utilizing a failure or bankruptcy scale similar to Altman's Z score, to obtain a measure of risk of failure.

Another important but neglected research topic concerns the methodology for measuring change. Although a number of studies have relied on similar techniques to those utilized in this study, others have used more narrow definitions of strategy and/or relied on continuous measures of change. Validation studies using multiple measures and multiple methods as suggested by Cook and Campbell (1979) would be a valuable contribution to the field.

Finally, it is important that future research consider the moderating impact of different environmental circumstances on change and change outcomes. The banking industry was undergoing several different types of
environmental change during the time of this study, including regulatory changes, temporary economic fluctuations, and technological changes to name a few. Future studies should consider examining strategic change and change outcomes during times of relative stability, or even during times of industry growth. It is quite likely that the outcomes observed in this study, and others that have concentrated on industries undergoing periods of disequilibrium, may be different under different environmental circumstances.

Conclusions

This study represented an attempt to examine some basic but seldom tested assumptions underlying the strategic management perspective. The focus of the study was on exploring some of the firm level factors that the literature suggested would influence change and change outcomes. It was anticipated that the outcomes would provide a "middle-ground" approach for understanding strategic change. That is, it would identify certain key factors that serve to instigate change and moderate outcomes.

The results were mixed, sometimes providing support for the hypothesized relationships, sometimes providing unexpected but understandable outcomes, and sometimes providing ambiguous and confusing outcomes. Overall, the results strongly supported the strategic management
perspective of strategic change, and provided little evidence to support the natural selection view underlying the population ecology perspective. However, it is apparent that much more research is needed to understand this phenomenon. Strategic change is both an important and interesting research topic. It is hoped that this study will add to this growing research stream and provide a framework upon which future researchers can continue to build.


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## APPENDIX A

### LOGISTIC REGRESSION RESULTS

Table 28. Results of Logistic Regression Analyses for Change Antecedents

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Regression Coefficient</th>
<th>Standard Error</th>
<th>Wald Chi-Square</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>.107</td>
<td>.167</td>
<td>.409</td>
<td>.040</td>
</tr>
<tr>
<td>ROACH</td>
<td>.028</td>
<td>.195</td>
<td>.021</td>
<td>.006</td>
</tr>
<tr>
<td>EFF</td>
<td>-.779</td>
<td>.703</td>
<td>1.229</td>
<td>-.141</td>
</tr>
<tr>
<td>EFFCH</td>
<td>-.442</td>
<td>.481</td>
<td>.844</td>
<td>-.113</td>
</tr>
<tr>
<td>CHLNAS</td>
<td>-.065</td>
<td>.022</td>
<td>8.776 **</td>
<td>-.141</td>
</tr>
<tr>
<td>LIQUID</td>
<td>-3.815</td>
<td>.458</td>
<td>69.336 ***</td>
<td>-.432</td>
</tr>
<tr>
<td>ASCAP</td>
<td>-.057</td>
<td>.036</td>
<td>2.593 *</td>
<td>-.093</td>
</tr>
<tr>
<td>LAGE</td>
<td>.473</td>
<td>.091</td>
<td>27.326 ***</td>
<td>.246</td>
</tr>
<tr>
<td>LASSET</td>
<td>-.269</td>
<td>.087</td>
<td>9.668 ***</td>
<td>-.167</td>
</tr>
<tr>
<td>HOLDC</td>
<td>-.248</td>
<td>.171</td>
<td>2.107</td>
<td>-.068</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.03</td>
<td>1.063</td>
<td>8.088 **</td>
<td>-</td>
</tr>
</tbody>
</table>

-2LL = 217.39  pseudo R² = .1854

* p < .10  
** p < .05  
*** p < .01
### Table 29. Results of Regression Analysis for Degree of Change - EFF Omitted from Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Regression Coefficient</th>
<th>Standard Error</th>
<th>t-statistic</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>.065</td>
<td>.085</td>
<td>.775</td>
<td>.044</td>
</tr>
<tr>
<td>ROACH</td>
<td>-.034</td>
<td>.118</td>
<td>-.295</td>
<td>-.014</td>
</tr>
<tr>
<td>EFFCH</td>
<td>.019</td>
<td>.107</td>
<td>.181</td>
<td>.009</td>
</tr>
<tr>
<td>CHLNAS</td>
<td>-.031</td>
<td>.013</td>
<td>-2.430 **</td>
<td>-.124</td>
</tr>
<tr>
<td>LIQUID</td>
<td>-1.993</td>
<td>.245</td>
<td>-8.107 ***</td>
<td>-.409</td>
</tr>
<tr>
<td>ASCAP</td>
<td>-.051</td>
<td>.021</td>
<td>-2.470 **</td>
<td>-.151</td>
</tr>
<tr>
<td>LAGE</td>
<td>.359</td>
<td>.054</td>
<td>6.592 ***</td>
<td>.339</td>
</tr>
<tr>
<td>LASSET</td>
<td>-.145</td>
<td>.052</td>
<td>-2.793 ***</td>
<td>-.164</td>
</tr>
<tr>
<td>HOLDC</td>
<td>-.053</td>
<td>.104</td>
<td>-.512</td>
<td>-.027</td>
</tr>
<tr>
<td>UNEMP</td>
<td>-.043</td>
<td>.029</td>
<td>-1.458</td>
<td>-.073</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.02</td>
<td>.512</td>
<td>5.906 ***</td>
<td>1.71</td>
</tr>
</tbody>
</table>

R² = .2053   F = 21.850   N = 857 (4 obs. had missing variables)

* p < .10  
** p < .05  
*** p < .01
### APPENDIX C

**REGRESSION ANALYSIS - EFFCH OMITTED**

Table 30. Results of Regression Analysis for Degree of Change - EFFCH Omitted from Analysis

<table>
<thead>
<tr>
<th>Variable</th>
<th>Unstandardized Regression Coefficient</th>
<th>Standard Error</th>
<th>t-statistic</th>
<th>Beta</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
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<td>.083</td>
<td>.735</td>
<td>.041</td>
</tr>
<tr>
<td>ROACH</td>
<td>-.039</td>
<td>.118</td>
<td>-.330</td>
<td>-.016</td>
</tr>
<tr>
<td>EFF</td>
<td>-.075</td>
<td>.158</td>
<td>-.480</td>
<td>-.025</td>
</tr>
<tr>
<td>CHLNAS</td>
<td>-.031</td>
<td>.013</td>
<td>-2.467 **</td>
<td>-.125</td>
</tr>
<tr>
<td>LIQUID</td>
<td>-1.989</td>
<td>.246</td>
<td>-8.085 ***</td>
<td>-.408</td>
</tr>
<tr>
<td>ASCAP</td>
<td>-.050</td>
<td>.021</td>
<td>-2.398 **</td>
<td>-.147</td>
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<td>LAGE</td>
<td>.359</td>
<td>.054</td>
<td>6.584 ***</td>
<td>.339</td>
</tr>
<tr>
<td>LASSET</td>
<td>-.147</td>
<td>.052</td>
<td>-2.821 ***</td>
<td>-.166</td>
</tr>
<tr>
<td>HOLDC</td>
<td>-.054</td>
<td>.104</td>
<td>-.522</td>
<td>-.027</td>
</tr>
<tr>
<td>UNEMP</td>
<td>-.043</td>
<td>.029</td>
<td>-1.458</td>
<td>-.073</td>
</tr>
<tr>
<td>Intercept</td>
<td>3.07</td>
<td>.517</td>
<td>5.941 ***</td>
<td>1.71</td>
</tr>
</tbody>
</table>

R^2 = .2054  F = 21.875  N = 857 (4 obs. had missing variables)

* p < .10
** p < .05
*** p < .01
Dr. Scifres obtained a B.A. degree from Mississippi College in 1977, and an M.B.A. from the University of Southern Mississippi in 1981. He worked for a number of years in the Banking Industry prior to enrolling in the Ph.D. program at LSU. He is currently an Assistant Professor at Stephen F. Austin State University. His publications have appeared in Management International Review, Journal of Small Business Strategy, and Journal of Applied Psychology. His primary research interests are in the areas of strategic change, corporate entrepreneurship, and leveraged buyouts and strategic direction.
DOCTORAL EXAMINATION AND DISSERTATION REPORT

Candidate: Elton L. Scifres, Jr.

Major Field: Business Administration (Management)

Title of Dissertation: Strategic Adaptation in the Banking Industry: An Exploration of the Antecedents and Consequences of Strategic Change Following Deregulation

Approved:

[Signatures]

Major Professor and Chairman

Dean of the Graduate School

EXAMINING COMMITTEE:

[Signatures]

Date of Examination:

August 10, 1994