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Strategic and financial factors in business failure, bankruptcy and reorganization

Moulton, Wilbur Norton, Ph.D.

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U·M·I
300 N. Zeeb Rd.
Ann Arbor, MI 48106

STRATEGIC AND FINANCIAL FACTORS IN BUSINESS FAILURE, BANKRUPTCY AND REORGANIZATION

BY

WILBUR NORTON MOULTON

B.S., Sioux Falls College, 1949
M.S., University of Minnesota, 1952
Ph.D., University of Minnesota, 1954

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Chairperson

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ABSTRACT

This is a study of financial and strategic factors relating to the failure and bankruptcy of 73 firms that went bankrupt from 1980 to 1986. The characteristics of the bankrupt firms were compared with those of a matching sample of nonbankrupt firms. On average the bankrupt firms were weaker than the comparison firms six years before bankruptcy, but they pursued more aggressive growth strategies. The firms were approximately equally divided between four groups based on firm sales growth or decline and industry growth or decline. The typical decline pattern observed was asset and debt growth followed by decline in profitability. Some firms declined slowly over the entire study period and others collapsed rapidly following a short expansionary period. Of the 73 bankrupt firms, 40 firms were reorganized, but only 12 emerged from bankruptcy at least half their prebankruptcy size. The only significant predictor of successful reorganization was prebankruptcy size. In the course of the study bankruptcy prediction models and statistical classification techniques were extensively reviewed. The Altman bankruptcy model was tested and recalibrated. A new model using only two of the Altman variables, retained earnings as a fraction of total assets and the market value of equity to total liabilities ratio, proved to be an equally powerful predictor of bankruptcy. Theoretical and practical applications of the results are discussed.

Capitalism without bankruptcy is
like Christianity without hell.

Frank Borman
Chairman of Eastern Airlines

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PREFACE

A brief note on the organization of this dissertation may be helpful to the reader. The organization was designed to allow the presentation of several conceptually separate approaches to the overall topic, using a common theoretical foundation and database, without excessive repetition of the introductory material.

The first three chapters provide a general introduction to the topic of business failure. They also present the theoretical and methodological foundations for the study as a whole. Chapter IV includes a replication of earlier work on a bankruptcy prediction model used extensively in this study. It also includes a relatively technical exploration of some of the statistical techniques used in this study. Chapter V provides basic information on the selection of the research sample and the collection of data used throughout the study. Chapters VI, VII, and VIII present the research designs and findings of the study related to business decline and failure. Chapter IX is devoted to bankruptcy outcomes and reorganization. Chapters X integrates the specific research findings of the earlier chapters with established streams of research, and Chapter XI suggests some practical managerial applications of the research findings. Chapter XII briefly outlines some possible research extensions.

Appendix A provides a brief description of each of the 73 bankrupt firms included in the study. Appendix B is made up of eight case studies, which provide more detailed information on the bankruptcy and reorganization of representative firms. Two cases were selected to exemplify each of the four major failure pathways described in the thesis.

In reading this document the following information on a nomenclature convention may be useful. The study focuses on the behavior and performance of firms in a six year period prior to bankruptcy. Year one is defined as the year covered in the last available annual report prior to bankruptcy, year two is the next prior year, and so on back to year six. Comparison nonbankrupt firms were matched on year one data, and the year numbering follows the same pattern as for bankrupt firms.

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Chapter 1

INTRODUCTION

Chapter Introduction

This chapter begins by outlining the role of business failure in business and strategic management research. This is followed by a brief history of business failure and bankruptcy with emphasis on the more recent history. Current bankruptcy definitions, laws, and procedures are briefly described. Some common explanations of business failure from the fields of management and finance are listed. The chapter concludes with a state of the major objectives of the study.

The Role of Business Failure and Bankruptcy in Business Research

Failure and bankruptcy in business research are treated much as death and dying in medicine. Their reality is not denied, but they are pushed into the background as vaguely defined antitheses to health or punishments for those imprudent enough not to follow the prescriptions of the experts. Human obituaries and actuarial statistics also have their counterparts in business, but in both cases they tend to mask the harsh realities, rather than provide a better understanding

of the underlying phenomena.

Every significant opportunity carries with it the possibility of failure. For businesses the most dramatic failure is bankruptcy, but more frequently the failure takes the form of slow decline and ultimate disappearance. In the context of life cycles, bankruptcy is the equivalent of violent death, as compared to some of the more benevolent end-games, such as mergers or sale of assets. Although bankruptcy can be caused by purely external forces, both personal and business bankruptcy tend to carry a moral stigma.

Almost all companies are at least occasionally subject to financial stress, and some industries have a higher incidence of stress and failure than others. In most cases, companies recover in a relatively short time, either as a result of cyclical changes in the business environment or successful managerial action. However, in a limited number of cases, companies experience a decline, frequently rapid, that terminates in business failure and corporate dissolution through bankruptcy, merger, or other forms of liquidation, usually at substantial loss to creditors and owners. Public explanations for business failure usually focus on environmental or macroeconomic factors, but closer observation frequently suggests that for established and historically profitable firms, a primary reason for business failure is faulty managerial decision making.

There are both theoretical and practical reasons for studying corporate failure and bankruptcy, reasons much the same as those that make the study of pathology so useful in medicine. Many of the questions and issues that are relevant could be raised in other contexts, but the crisis of business failure may make patterns visible that would be difficult to detect under more normal circumstances. Alternately, the stressful decision-making environment may evoke different responses than those observed under more normal circumstances. In either case, if certain patterns can be detected which appear to have predictably negative effects on corporate survival, that would be useful information for managers and investors, whether or not they were imminently faced with corporate failure.

A Brief History of Bankruptcy

Legal procedures for dealing with insolvent estates of debtors date back at least to ancient Roman law. The principles and procedures were given extensive codification during the Middle Ages, especially in the rules promulgated by the leading city-states for merchants. Bankruptcy for individuals had much of its origin in English law, primarily arising from attempts to decriminalize insolvency, and consequently to end the practice of imprisoning debtors. In general, bankruptcy has had two major thrusts, one the

equitable distribution of the debtor's assets among creditors, the other making provision for rehabilitating the debtor. As far back as Roman law, distinctions were drawn between involuntary bankruptcy initiated by creditors and voluntary bankruptcy initiated by the debtor. In both cases, the process required the involvement of the civil authorities.

In the United States, bankruptcy has been subject to both state and Federal law, but Federal jurisdiction has become dominant. Although there had been earlier Federal legislation, the first general bankruptcy act was passed by Congress in 1898. Since then there have been major revisions in 1934, 1938, and 1978. The Bankruptcy Reform Act of 1978 greatly facilitated corporate reorganizations, as well as making major changes in bankruptcy laws relating to liquidations and laws relating to individuals.

Recent History of Business Failure and Bankruptcy

Bankruptcy and other forms of business failure have attracted increased attention in recent years. Dun & Bradstreet has collected and published failure data since 1857. The failure rate reached an all-time high of 154 per 10,000 listed firms in 1932, then declined to an all-time low of 4 per 10,000 firms in 1945. After 1945 the rate rose to 64 in 1961 and fell to 24 in 1978. Since 1978 the rate has climbed steadily through 1986 when the rate was 120 per 10,000 firms.

The increase in size of the liabilities of failed firms and the proportion of large firms has been even more marked. In 1946 only 0.6% of the failed firms had liabilities in excess of a million dollars; in 1986 it was 6.0%, an increase that is only partly explained by inflation. In addition to economic factors, the increase since 1978 has undoubtedly been influenced by changes in the Bankruptcy Code brought about by the Bankruptcy Reform Act of 1978.

In the past, failure rates have declined during economic upswings, but the rate has risen every year during the economic expansion that began in 1983, an expansion that has been marked by its unevenness across industries, firms, and geographic sections of the country. It is not clear to what extent the continuing high failure rate is due to temporary effects, such as the export-import imbalances, foreign currency exchange-rate fluctuations, and high Federal deficits, and to what extent it reflects long-term changes in the national economic structure and a maturing society. Not only has the bankruptcy rate dramatically increased, but the size of the corporations involved has also increased; bankruptcy is no longer the domain of small businesses and high-risk new firms. Following Penn Central in 1970, such major firms as W. T. Grant, Braniff, Itel, Wickes , Storage Technology, Wheeling-Pittsburgh, and LTV Corporation have undergone bankruptcy. A relatively new phenomenon has been the deliberate election of bankruptcy as a corporate strategy, such as the Manville Corporation and A. H.

Robins bankruptcies to limit their product liability obligations, and the Wheeling-Pittsburgh and Continental Airlines bankruptcies to get relief from life-threatening obligations to employees. Although neither case ended in bankruptcy, Chrysler and International Harvester used the threat of bankruptcy in dealing with both internal and external constituencies.

Some Principles of Business Failure and Bankruptcy

Before proceeding to a review of bankruptcy law and procedures, an informal review of the common understandings of corporate failure and bankruptcy may be useful. The several levels or definitions of business failure, as summarized by Altman (1983: 5-7), are: (i) economic failure--any enterprise for which the rate of return is significantly less than the prevailing rate of return on similar investments on a risk-adjusted basis, (ii) business failure--discontinuance of a business which results in a loss to creditors, whether through bankruptcy, negotiated settlements, or liquidation with unpaid claims, (iii) insolvency--inability to meet current obligations as a result of inadequate cash flow, (iv) bankruptcy insolvency--total liabilities exceed a fair valuation of the assets of the firm, and (v) legal bankruptcy--formal declaration of bankruptcy by the courts.

Business failure does not necessarily proceed through the

legal mechanism of bankruptcy, but that course of action is so common that failure and bankruptcy have come to be almost synonymous in everyday language. The role of bankruptcy has been succinctly summarized by Altman (1983: 4), a leading authority on bankruptcy, in the following words:

> "In any economic system, the continuous entrance and exit of productive entries are natural components. Since there are costs to society inherent in the failure of these entities, laws and procedures have been established (1) to protect the contractual rights of interested parties, (2) to provide for the orderly liquidation of unproductive assets, and (3) when deemed desirable, to provide for a moratorium on certain claims, to give the debtor time to become rehabilitated and to emerge from the process as a continuing entity. ....If an entity's intrinsic or economic value is greater than its current liquidation value, then from both the public policy and entity ownership viewpoints, the firm should attempt to reorganize and continue. .....The primary groups of interested parties are the firm's creditors and owners."

Bankruptcy may be either voluntary--initiated by the debtor firm--or involuntary--initiated by the firm's creditors. In many, if not most, voluntary bankruptcies, the action is forced by the creditors, so frequently the only thing controlled by the debtor is the timing. Whether voluntary or otherwise, bankruptcy is not a final outcome, but only a temporary state which eventually leads to the same outcomes as those for unsuccessful firms which do not go bankrupt: the firm is liquidated, sold to others, returns to profitability, or some combination of the above. If the firm is reorganized under Chapter 11 of the Bankruptcy code, there is often a partial liquidation of assets with the surviving firm being diminished in size. Although the outcomes may be the same under bankruptcy as in nonbankruptcy endgames, bankruptcy does

greatly affect the path to the final outcome by transferring primary control from the owners to the creditors and the Bankruptcy Court. This is appropriate, since in a number of different ways bankruptcy can be seen as a management/ownership failure. First, the firm failed to be profitable, then it failed to turn around, and finally it failed in finding an asset-preserving end game.

The Bankruptcy Code (Weintraub & Resnick, 1980 and annual supplements) provides a set of procedures and rules for bankruptcy and reorganization, but each case leads to a unique settlement. Bankruptcy occurs when the firm has more legitimate claims on its assets than it can manage. Once the firm files for bankruptcy, creditors become active participants in the firm's decision-making process under the oversight of a Bankruptcy Court judge. As will be discussed in greater detail below, the claimants not only have different priorities in their claims on the firm's assets, but they may also different expectations with regard to the value of alternative outcomes. If the firm is completely liquidated, the distribution of the proceeds is relatively straight-forward. However, if a firm, or any part of it, is reorganized, the negotiations are much more complex. In addition to accounting for current assets and liabilities, prospects for the future profitability of the reorganized firm must be estimated. This in turn requires estimates of the health of the industry, the nature of the competition, the value of the nonfinancial assets of the firm,

and the quality of the management, current or to be recruited.

The reorganized firm may emerge from bankruptcy essentially intact or almost totally transformed. If the firm had been essentially sound with only limited threats from which it needed specific or short-term relief, recovery may be quick and complete. If the firm had been subject to major financial or strategic deterioration, substantial recovery may be difficult, if not impossible. As an intermediate case, the bankrupt firm may have valuable parts which are worth preserving after major surgery. Even if the old business is not worth continuing, the corporate shell may have value for some new endeavor (Nelson, 1981). The complexity of the reorganization decision is complicated by tax considerations. Continuation of the firm may be necessary to utilize accumulated tax benefits, but the tax code imposes complex restrictions on the use of those benefits. No further attempt will be made here to consider tax consequences of reorganization, but their importance should not be overlooked.

The relationships between parent companies and subsidiaries in bankruptcy are complex. A parent firm may go bankrupt without one or more of its subsidiaries doing the same, or a subsidiary may go bankrupt without affecting the status of the parent company. The critical considerations are the extent to which the financial obligations of the parent and

its subsidiaries are kept separate, and the financial transactions between the two are recorded according to standard accounting procedures. If the parent firm is bankrupt, and a subsidiary is a valuable asset, the disposition of that asset is subject to the bankruptcy proceedings, which may lead to the sale of the subsidiary as a unit or its dismantlement and liquidation.

Causes of Bankruptcy

It has been traditional to associate bankruptcy with three primary factors: economic recession, bad management, and changing technology. Clearly either a general recession or more localized declines in the economic environment may put businesses under stress and increase the probability of failure. Environmental factors other than the general economy may be critical; new technology may destroy the demand for old products or services, and demographic and cultural trends may reduce demand. Changes in governmental regulation may affect competition, as in the transportation and nuclear power industries. Yet the observation is the same: under what are generally similar circumstances, some businesses survive while others fail.

Consistent with the observation that the bankruptcy rate, prior to 1980, had been highly correlated with business cycles, there is a strong tendency to attribute bankruptcy to

macroeconomic factors. See Altman (1983) for a general presentation of macroeconomic effects on bankruptcy. Clearly either a general recession or more localized declines in the economic environment may put businesses under stress and increase the probability of failure.

In the finance literature and common business wisdom, bankruptcy is commonly attributed to financial factors such as inadequate cash flow, excessive debt, or loss of creditor confidence. Although any of these or related explanations may be the proximate cause of bankruptcy, they would seem to be more symptoms of decline and impending failure than causes.

If economic and technological factors alone are insufficient predictors of specific bankruptcies, is managerial decision-making the critical factor? The fields of finance and strategic management tend to respond to this question with divergent viewpoints (Bettis, 1983). Finance theory treats managerial behavior as an element of unsystematic risk, which cannot be controlled on a firm basis, but which can be reduced or eliminated by proper portfolio diversification. For strategic management, the management of unsystematic risk is central to the discipline. While the management of unsystematic risk is of critical importance, this does not imply that all risk can be controlled. Bourgeios (1984) makes this point using the traditional philosophical terminology of determinism and free will. Perhaps the best balance is to

recognize that there is a place for the exercise of managerial judgment within a context in which many of the constraints are beyond the decision maker's control.

Purposes of this Study

This study will focus directly on the circumstances and causes of corporate failure. The primary perspective will be that of strategic management with emphasis on corporate history and behavior. The work will be directed to the failure of entire corporations or organizations, not component units or product-markets. Prior work on declining business, turnarounds, and bankruptcy prediction makes substantial contributions to the study, and much of the emphasis will be on integrating these perspectives. Bankruptcy, the most dramatic manifestation of corporate failure, will receive major attention, but other kinds of corporate death will be considered.

A primary thesis of this study is that business failure is a process which can be related to both managerial action and environmental forces. It is proposed here that the failure process can proceed over a small number of patterns or pathways which, while they have certain features in common, are conceptually and practically distinguishable. The formal process of legal bankruptcy may play a major role in the process in some cases, but not all. The pathways that are

described all start with the assumption of a business as a going concern and proceed to some definitive conclusion, which may be liquidation, reorganization, or some combination or modification of the two. The frameworks described have much in common with those previously proposed for decline and turnaround. Many, but not all, failures can be seen as failed turnarounds; other failures may follow decline without any visible recognition of the decline or attempt at turnaround. Still other failures are catastrophic in character, sudden collapses with no opportunity for turnaround.

Summary

The study of business failure and bankruptcy, like the study of pathology in other fields, can make an important contribution to business research. Bankruptcy procedures, both as mechanisms for equitable treatment of creditors and for the protection of debtors, have a long history. In the United States, bankruptcy administration is primarily a Federal function. The Bankruptcy Reform Act of 1978 made major changes in the Bankruptcy Code, and those changes have led to substantial changes in the way bankruptcy is used by businesses.

Business failure and bankruptcy both have a variety of definitions ranging from below normal returns to legal bankruptcy. The legal bankruptcy rate has increased sharply in

recent years, in part due to changes in the law and in part to changing economic conditions. Strategic management has tended to blame business failure on environmental factors and bad management, while the finance literature tends to focus on financial factors such as debt levels and cash flow. The major thesis of this study is that business failures are primarily the result of improper organizational responses to environmental stresses, and that the observed financial factors are more symptomatic than causal. The purposes of the study were introduced, but the full statement of the research objectives is the subject of the next chapter.

Chapter 2

RESEARCH OBJECTIVES AND METHODOLOGY

Introduction

This chapter lays out the research objectives of this dissertation and provides a summary of the research methodology. The research is intended to enrich previous research on business turnarounds and organizational decline, and to provide insights on business failures and bankruptcies. The major emphases are on environmental factors, firm characteristics, and decline patterns. The research methodology, which is described and justified, is eclectic, but consistently extrafirm in perspective.

General Objectives

The primary objective of the research was to obtain a better understanding of business failure, bankruptcy, and reorganization from both managerial and financial points of view. This understanding was to be achieved by describing and analyzing a significant number of business failures, bankruptcies, and reorganizations. The first step was to develop a comprehensive model for business decline and failure based on prior research in strategic management and finance.

The second step was to develop a data base on a sample of bankrupt firms. Third was the generation and testing of a series of hypotheses relating to failure, bankruptcy, and reorganization using the broad model as conceptual framework. The final step was to take the formal research results and translate them into theoretical and practical applications to important strategic problems and research streams.

This work should add to existing research on declining industries and turnarounds by following the entire course of events and looking at corporate as well as business-level outcomes. Most of the previous work on turnarounds has ignored cases in which the firm failed, and the work on declining industries has used business units, not firms, as the level of analysis. Another contribution of this work is the integration of strategic management and finance concepts. On the finance side the work should add depth to the empirical bankruptcy prediction models by considering firm and industry-level variables, which might lead to improved prediction models. It also makes a contribution to the growing body of research on organizational decline and death, with particular applications to for-profit business organizations. Finally it contributes to the understanding of organizational decision-making by deducing managerial behavior from organizational actions.

Finally a better understanding of the failure and reorganization process should lead to insights and

prescriptions which would be useful to practicing managers and investors. Business failure and bankruptcy are no longer rare events or limited to new, small entrepreneurial firms. An increasing number of managers are being forced to cope with the death throes of firms, and it is increasingly important that investors, both equity and debt holders, monitor managerial behavior to ensure that their interests are well served.

While the general topic of this research study is business failure, bankruptcy and reorganization, that is a much too large and diverse topic for a single study, so it is necessary to define as precisely as possible the scope of the work reported here. As in most research projects, the scope and objectives of the work evolved during the course of the study, so the research framework outlined in this chapter is both the plan and the product of the work.

As indicated in the introductory chapter, business failure and bankruptcy have received very little attention in strategic management research, and limited attention in related disciplines. Consequently, from the initiation of the project, it was recognized that the work would need to be broadly exploratory and interdisciplinary. The extent to which the study would require attention to methodological issues was not anticipated.

Major Objectives

The overarching question that drove the entire project was: why do some firms fail when others succeed? This single question can be broken down into sets of increasingly detailed questions. The first subset includes the following questions:

1. Are there common patterns in the environments of failing firms that are significantly different from those of successful firms?
2. Are there characteristics that distinguish failing firms from successful firms before failure is recognized as a significant possibility?
3. Are there common patterns in the way in which failing firms respond to environmental stress?
4. Are there common patterns in the way in which failing firms play out their failures?

Approached from a more theoretical perspective, the subset of questions would include the following:

1. Are the circumstances and behavior of failing firms consistent with the general paradigms of strategic management?
2. Is there existing theory in strategic management and related disciplines that can be used to explain the observed characteristics of failing firms?
3. Can strategic management theory and normative prescriptions be used to detect and prevent business

failure?

Research Scope

Given these broad objectives, it was necessary at the outset to establish some parameters to define and limit the scope of the study. A major constraint was the limitation of the study to large, established, for-profit business organizations. That constraint was operationalized by using a research sample of publicly traded firms whose financial records were available on the Compustat database. The sample included only firms which had at least six years of data, and which had filed for bankruptcy subsequent to the implementation of the Bankruptcy Reform Act of 1978.

A second major constraint was the decision to limit the study to an extrafirm perspective using only publicly available information. This included narrative materials, such as corporate annual reports and business publications, as well as the quantitative financial data. The requirement that the firms were publicly traded helped to ensure that financial and management information about the firms was available in the press and public documents. The amount of narrative information varied widely from firm to firm, largely depending on the size of the firm. Limited narrative information on all the firms was available in either Standard and Poor's Corporate Records or Moody's Manuals. For some firms little more

information was available; for other firms the amount of material was immense. The bankruptcies of Manville, LTV Corporation, and other billion-dollar firms have received blow-by-blow reports and extended editorial comment in the business press. However, the public information criterion was more than a research convenience. The entire perspective of the research was that of an external stakeholder or observer. A major objective of the research was to develop theory and insights that would be useful to external stakeholders such as stockholders, creditors, analysts, and public policy makers who do not have direct access to the private information and thought processes of managers.

The study focused on total corporate performance, rather than on product-markets, strategic business units, or other corporate subunits frequently studied in strategic management. This limitation was imposed, in part, by the heavy dependence on published financial data, but it is consistent with the study's concern with investors, creditors, and other external stakeholders. Limiting the study to corporate-level behavior and performance also facilitated the integration of this research with a bankruptcy research stream in finance that is stronger than the research stream in strategic management.

The scope of the research was narrow in terms of the types of firms to be studied and the kinds of information to be used, but it is uniquely broad according to two other measures.

First, it is broad in concept using a wide range of both strategic management and finance concepts to deal with a single phenomenon, business failure. Second it is broad in following the failure process over an extended period of time and events. Most of these elements have been studied before, but there has been little effort to follow the full course of decline, failure, and final outcomes. The intended scope of the research can be seen more clearly in the conceptual model developed in the next chapter and illustrated in Figure 3.2 on page 35.

Specific Objectives of the Research

Business failure covers a wide range of circumstances and outcomes, of which basically only bankruptcy is to be studied here. Following Altman's (1983) definitions, the following distinctions between unprofitability, decline, and failure are used in this study. Any firm that has returns less than those available from comparable investments on a risk-adjusted basis is defined as an economic failure. A declining firm is defined as any firm with a negative net income, which implies that assets are being depleted.

The specific research objectives are related to four categories of questions which follow the course of decline and failure: characteristics of the environments of failed firms, characteristics of failed firms, patterns of decline and

failure, and outcomes of bankruptcy or other failure events. The specific research questions listed below are organized into these four categories. The questions are listed here only in abbreviated form. The formulations of specific research questions and hypotheses are reported in the separate subsequent chapters of this dissertation. It should be noted that the questions listed here are descriptive and substantive. The theoretical implications of the questions and the subjective aspects of the rationale of decision makers is taken up in the separate descriptive chapters and two summary chapters at the end of the dissertation.

Not all of the research questions were pursued with equal vigor or rigor. In some cases the information required was unavailable or inadequate. In some cases the available information was sufficient to draw qualitative conclusions, but insufficient for statistical hypothesis testing.

Environmental Characteristics of Failed Firms

1. Do some industries have a higher prevalence of failure than others?

2. What is the relationship between the growth or decline of a firm and the growth or decline of the industry of which it is a part?

3. Does the relative financial strength of firms change from one time period to another?

4. Are failures more prevalent in some time periods than others?

5. Do specific environmental events have significant effects on firm failures?

Internal Characteristics of Failed Firms

1. Are the financial characteristics of failing firms different from those of comparable nonfailing firms five or more years before failing?

2. Are firm failures the result of specific events or decisions internal or unique to the firm?

3 Are firm failures related to the extent of firm diversification?

4. Are firm failures related to the age of the firm?

Patterns in the Decline of Failing Firms

1. Are the rate of decline and changes in other financial indicators of failing firms correlated with the growth or

decline of the industry in which the firm operates?

2. What is the relationship between the decline in the profitability of the firm and changes in its size?

3. Does the change in stock price of the failing firm serve as a good indicator of the decline of the firm?

4. Is there a pattern to the timing of the decline of various financial indicators as the firm approaches failure?

5. Is the risk behavior of failing significantly different from that of comparable nonfailing firms?

Patterns in the Reorganization and Other Outcomes

1. What is the relationship between the firm's environment and its bankruptcy outcome?

2. Are there specific firm characteristics prior to bankruptcy that are useful predictors of bankruptcy outcomes?

3. Are there strategic choices open to failing firms prior to bankruptcy which can affect their reorganization outcomes?

4. Are there strategic choices open to firms in bankruptcy which can affect their reorganization outcomes?

5. What bankruptcy outcomes are most desirable for the various stakeholders?

Research Methodology

In developing the research methodology, an attempt was made to be responsive to calls by leading strategic management researchers for richer research designs. Harrigan (1983) and Thomas (1984) have urged researchers to use more diverse approaches, and Bower (1982) has urged more collaborative efforts and more significant contributions to public policy issues. Miller Friesen (1982) make the case for using more longitudinal data and for using a mix of qualitative and quantitative data. The methods advocated all bear a strong relationship to Glaser Strauss's (1967) classic work on grounded theory.

As indicated in the section above the research was both exploratory and interdisciplinary, rather than narrowly focused on a single issue in well-established streams of research. If the role of theory can be represented as shown in Figure 2.1 below, this research is more directed to theory building than testing, and the theory testing that is done is directed to questions of internal validity, rather than external validity.

Figure 2.1

Stages of Theory Development

Theory Building			Theory Testing	
Exploration	Concept Development	Hypothesis Generation	Internal Validity	External Validity

Another way of looking at research methodologies is to classify them as descriptive or analytical and as qualitative or quantitative, as displayed in Figure 2.2.

Figure 2.2

Classification of Research Methodologies

	Qualitative	Quantitative
Descriptive	Single case studies,	Data bases, censuses
Analytical	Multiple case analyses,	Statistical analyses,

This research included activities in all four matrix quadrants. Data collection included both the development of a data base which would be useful for future research as well as the present study and the collection of qualitative materials for case studies. On the analysis dimension, individual cases were prepared, some more extended than others. Comparison of case studies (provided in Appendix B) provided insights for model and theory building, as well as a basis for drawing qualitative conclusions. The data base, which included both cross sectional and longitudinal data, was subjected to

extensive statistical analysis.

Although both quantitative and qualitative data were collected and used, the data and the analyses always reflected an extrafirm perspective (Greenwood Thomas, 1981). The major advantages of this approach are:

1. A practical viewpoint for investors, competitors, and analysts,
2. Consistency with work in finance,
3. Consistency with current trends in strategy research--value maximization and shareholder wealth creation, strategy and stock market performance, competitor analysis, strategic groups,
4. No need for firm permission or anonymity.

The major disadvantages are:

1. Lack of depth and detail,
2. Possible omission of important factors,
3. Lack of insights from decision makers.

The research methodology evolved in two phases. In the initial phase, the focus was simply instrumental: the selection of appropriate standard techniques for finding answers to the research questions. In the second phase, the interest focused on the techniques and methods themselves. This led to the testing of existing techniques and the development of new and improved applications of methods not so well-established.

Research Sample and Data Collection

The selection of the research sample was constrained by the intention to study the environment and behavior of individual firms, which sets an upper limit on sample size, and the intention of performing statistical analyses, which sets a lower limit. The original target for the research sample was 50 firms that meet the following criteria:

1. Publicly traded firms (NYSE, AMEX, OTC) prior to bankruptcy,
2. A minimum of six years of prefailure data,
3. Had filed for bankruptcy under the U. S. Bankruptcy Code after January 1980,
4. Failure process completed: reorganized, liquidated, ownership transferred,
5. Included on the Compustat Research File.

The final sample size was 73 firms, of which 61 had completed the bankruptcy process. Two kinds of firm data were collected, financial and operational. Most of the financial data for the firms prior to failure was available on Compustat, but it became necessary to search other sources such as Moody's Manuals, Standard and Poor's Corporate Records, and annual reports in a limited number of cases for missing data. For the operational and historical details, particularly those around the failure event, the major sources were the business press and company reports, including annual reports and

reorganization plans. The amount of qualitative data available for each firm varied greatly, from almost none to entire books and almost daily coverage in the business press for extended periods of time.

In addition to the sample of bankrupt firms, a matched sample of nonbankrupt firms was selected. For this sample, only quantitative data were collected. The use of the matched samples played a major role in this research. The most detailed information about the results is presented in Chapter 6, but the insights derived from comparisons of the matched samples appear throughout the the study.

A more detailed description of the research samples and the data collection is provided in Chapter 5.

Industry and Economic Data Collection

Only very limited industry data were required. The critical quantitative item was the classification of the industry as declining or growing. Aggregate industry sales or demand data were available from a number of governmental and private sources. Standard government economic data were used to adjust the industry and firm data for inflation.

Statistical Techniques

The primary statistical technique used was multivariate classification analysis, including multiple discriminant analysis, logit, and probit. The application of the classification techniques raised enough questions to justify an extended study, which is reported in Chapter 4.

Other than multivariate classification, the techniques used were relative routine applications of t tests, ANOVA, ANCOVA, and correlation analysis. Details about the methodology are reported together with the results in separate sections relating to each of the major issues.

Case Studies

The data collected was sufficient to prepare comprehensive case studies for many of the firms in the sample, actually much more than could be used in the time available. The narrative cases that are included in Appendix B were selected to be illustrative of major failure typologies that were developed in the course of the study. In order to simplify the cases and to facilitate analytical comparisons, a standard format for the cases was developed and used for all the case studies.

In addition to the extended cases, thumbnail sketches of all the bankrupt firms were prepared. These sketches are

presented in Appendix A.

Summary

This study of business failure and bankruptcy is intended to facilitate an understanding of the business failure process and to provide insights that may be helpful in avoiding these unwanted outcomes. The previous work on business turnarounds has emphasized successful turnarounds. The study of unsuccessful turnarounds should provide additional insights into organizational decline, particularly in for-profit organizations. The characteristics of a sample of publicly traded firms that filed for bankruptcy from 1980 to 1985 are to be studied in order to identify their prebankruptcy characteristics, to seek patterns in their decline, and to find predictors of their chances for successful reorganization. The characteristics of the failing firms are to be compared with a matching sample of nonfailed firms. The research perspective throughout is extrafirm, and the interests of the entire range of stakeholders are considered.

Chapter 3

THEORY AND MODELS OF BUSINESS FAILURE AND BANKRUPTCY:

Introduction

This chapter provides the theoretical basis for the research. A generalized model for business decline is developed that is equally applicable to successful and unsuccessful turnarounds. The model emphasizes the interaction of strategic responses with environmental stresses. Inappropriate responses can lead to strategic problems, which are made manifest by financial effects. Outcomes are dependent on the success of turnaround efforts. A second model is developed which can be used to help explain why some business failures lead to legal bankruptcy and others lead to less traumatic outcomes. The role of legal bankruptcy as a method for the resolution of conflicts between stakeholders in unsucceesful firms is emphasized. The relationship between these models and financial bankruptcy prediction models will be discussed.

A Decline-Failure-Turnaround Process Model

As discussed in the previous chapter on research objectives, this study had two major closely related

objectives. One was a broad exploration of the business failure phenomenon from the viewpoint of strategic management, and the second a search for applications of work from other fields to the topic. Consistent with those objectives the process model is broadly based on and makes explicit use of concepts from several fields. The unifying concepts are largely drawn from the organizational behavior field, particularly life cycles and organizational decline. The parts of the model devoted to the causes of decline and failure in business organizations are drawn from the strategic management paradigm which stresses the relationship between the environment of an organization and the managerial response to that environment. The model largely considers financial decisions as implementations of managerial strategy and financial performance information as indicators of organizational performance.

In terms of life cycles, business failure and bankruptcy are manifestations of decline and death. Using an analogy of the relationship between biological illness and death, the basic framework of the process model is shown in Figure 3.1. Although the illness analogy is useful as a framing device, it is too broadly conceptual to be of much value in sorting out the complex managerial and financial variables which characterize failing business organizations.

Figure 3.1

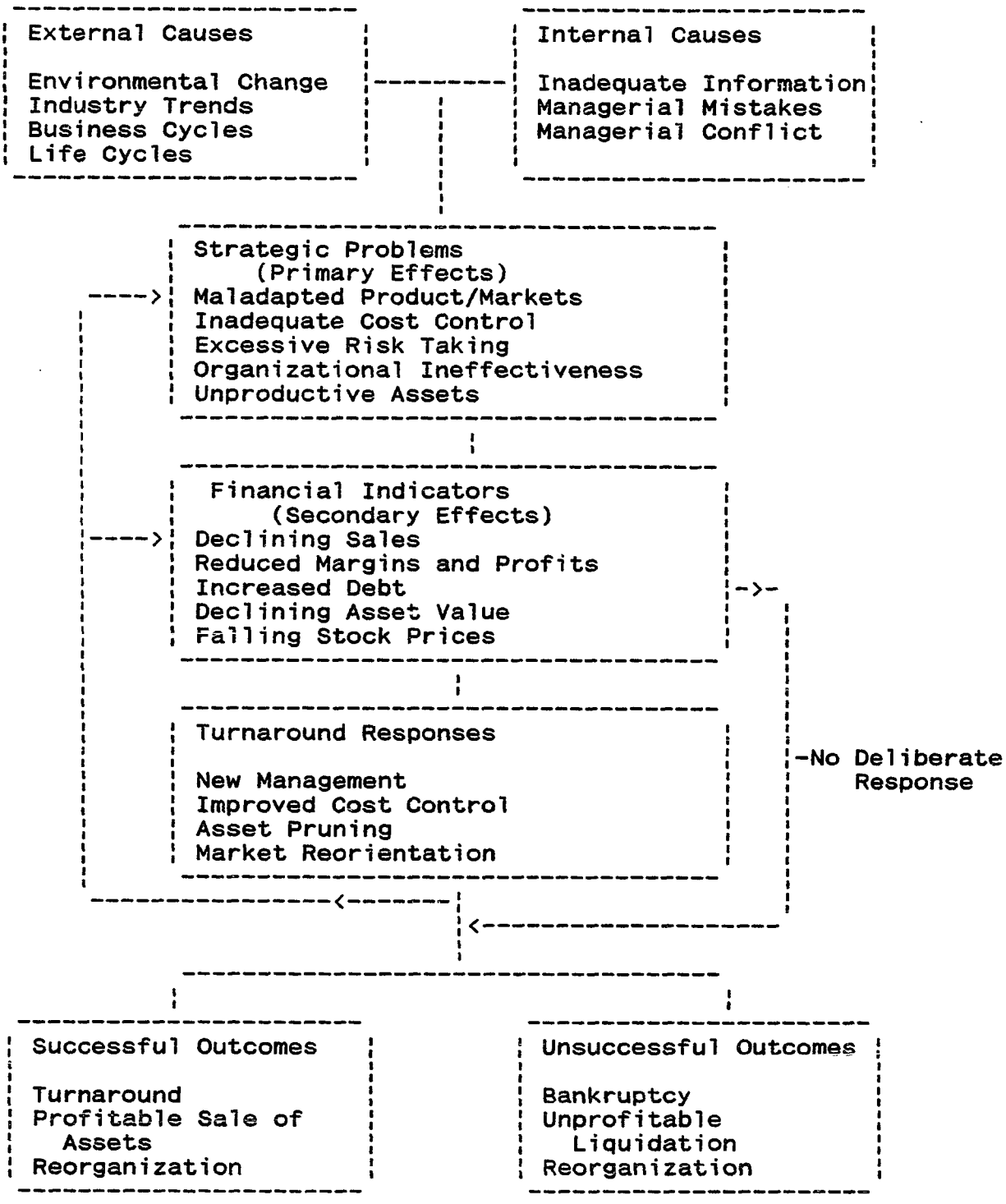
Generalized Pathology Model

CAUSES-----> EFFECTS---> RESPONSES--> OUTCOMES

(Infection) (Symptoms) (Treatment) (Recovery/Death)

A more comprehensive model for direct application to business situations using the abstract levels of causes, effects, responses, and outcomes is shown in Figure 3.2. As in the case of biological illness, the causes may be simple or complex, and the severity of the effects may range from minimal to lethal. While there is a certain logical direction to the flow in the diagram, it often involves recyclings in which outcomes become either new causes or new symptoms. Responses are defined as deliberate actions, which requires that the effects be recognized, but a cause may proceed to some outcome with no visible recognition of the symptoms or response. The causes may either be unknown or incorrectly diagnosed, and an observed outcome may or may not be a consequence of the assumed chain of causes, effects, and responses. In the early stages of decline, the causes may be multiple and weak, but in the end, bankruptcy is a classic crisis or death event.

Figure 3.2
Decline-Failure-Turnaround Process Model



The model assumes that business decline and failure are fundamentally caused by inappropriate or inadequate internal responses to external stimuli. This assumption is based on the observation that under essentially the same external constraints some businesses succeed, either by continued operations or by value preserving exit, and others decline and fail. The model does not require that an inadequate or inappropriate response be the result of bad decisions; the firm may only be unlucky. In Bourgeois' (1984) terms, the model accommodates both deterministic and free will events. The environment includes both the industry and the larger general environment. Examples of causes arising in the environment include recession, deregulation, decreased demand, new competitors, and new technologies. Complex multifaceted causes may be more typical than simple causes. Industry and firm cycles may be a critical factor, as firms seem to be most vulnerable at certain stages, particularly shakeout and decline (Baird & Thomas, 1985; Aaker & Day, 1986). New ventures are highly vulnerable, although at the earliest stage, firms may disappear without a trace, essentially stillborn.

The model divides the effects into two sequential stages, strategic and financial, or more broadly, primary and secondary effects. Alternately, the strategic effects might be considered the causes of the financial effects, and the financial effects can be seen only as indicators of some more fundamental underlying reality. Although the direction of the

causal chain is clear, strategic errors often are not recognized until the financial effects are obvious. On occasion what is called a financial indicator may be a deliberate choice, for example a high-debt strategy. In other cases, high debt may be an unanticipated consequence of other strategic choices. The financial effects are generally more universal than the strategic effects, which tend to be industry- or firm-specific. This may explain the success of financial bankruptcy prediction models which appear to be robust over both industries and time. Altman's 1968 Z-score model has been extensively used by researchers (Chakravarthy, 1986) and practitioners (Foster, 1986) without modification for twenty years.

The model indicates that the response phase may be bypassed, at least as far as a deliberate response is concerned. A change in the external environment may bring about spontaneous recovery, or a firm may decline and die with no discernible managerial response. Any deliberate response requires a multistage managerial process involving the recognition and analysis of the observed effects or symptoms, the selection of a course of action or treatment, and finally the application of the treatment. Ansoff (1984) and Mintzberg, Raisinghani, & Theoret (1976) have explored the general topic of strategic response to environmental signals. Initially there may be a failure to detect the environmental signals; this may be followed by a period of organizational inertia

during which action is delayed in the face of strong evidence that failure to act may have severe consequences. Action usually requires a concerted group effort which may not be possible until consensus is reached on both the problem and the solution, and until resources are mobilized to take action. Frequently responses may have to be made stepwise because of lack of consensus or resources.

Although the recognition, analysis, strategy formulation, and implementation sequence applies in nearly every problem situation, decisions for failing firms may be unusually difficult. For example, if new management is required, as is the case in many turnaround situations (Bibeault, 1982, Hofer, 1980), other responses may be delayed until the new management is in place, and old managers may delay their own ouster, even after owners or creditors are mobilized to force a change. If liquidation or merger of the firm is an important alternative, the decision is difficult for all parties concerned, and may be further complicated by the disparity of interests among those parties. In order to understand why action is so frequently delayed, it is useful to consider the interests and options available to the various stakeholders.

Distribution of Bankruptcy Losses among Stakeholders

Early in the decline, any losses accrue to the equity owners, which for the purpose of this discussion are assumed to

be a set of dispersed and unorganized stockholders. Substantial losses may occur before stockholders become aware of the problem. Many are passive investors and monitor only dividends and stock prices. Dividends are frequently smoothed and maintained even during periods of negative earnings (Lintner, 1956; Copeland & Weston, 1983), and stock prices reflect general market movements and other factors as well as corporate performance. Information on decline may be delayed and filtered by managers, who have a vested interest in putting events in their best light. Once a stockholder recognizes that the value of the firm is declining, there is little an individual investor can do to change the course of events, so the natural response is to sell the stock. The new owner is then in a similar situation, and over time the equity losses may be distributed over a series of owners, especially if the decline is slow. The market and book value of equity may not decline in parallel (Strategic Planning Associates, Inc., 1984). For a firm with poor earnings prospects and low-quality assets, book value may exceed market value. At low or negative book values the reverse is true, since the market value is never negative, and even highly risky future returns may have some value to shareholders. At this point shareholders, who at some earlier time would have gained from firm liquidation, now have nothing more to lose.

Once the equity value of the firm is consumed, the creditors' roles become dominant, but frequently complex and

conflicting. Bankruptcy law has a set of rules about claim preferences which can affect creditor choices, even before bankruptcy is established. In most instances institutional creditors are more effective competitors for residual value than individual bondholders, even though bondholders are served by trustees under provisions of bond indentures. Bulow & Shoven (1978) have developed a model for guiding stakeholders in making bankruptcy decisions largely based on tradeoffs between liquidation value and the present value of future earnings if the firm is not liquidated. However, both liquidation values and future income streams are difficult to predict. The book value of assets may be a poor measure of liquidation value, and liquidation value under bankruptcy may be depressed from ordinary market values. It is indirect costs such as these, as well as the direct costs of bankruptcy, that lead Bibeault (1982) and others to argue on a practical basis for voluntary liquidation over bankruptcy. Research in finance also seems to lead to the conclusion that bankruptcy costs are not trivial (Copeland & Weston, 1983).

Although theoretically managers are supposed to be agents for owners and dedicated to maximizing shareholder wealth, in fact managers and owners do have somewhat different interests. Agency theory, pioneered by Jensen & Meckling (1976) approaches this issue from the viewpoint of finance, and Williamson (1963) discusses the issue in more managerial terms. Pastena & Ruland (1986) have studied the merger/bankruptcy alternative, and

their results seem to suggest that managers tend to reject the merger alternative, even when it would benefit the owners. Managerial self-interest is intensified by the concentration of the manager's economic interests in a single firm, while for both equity and debt holders their interests are more commonly only a part of a diversified portfolio of assets. Furthermore, managers of failing firms suffer not only immediate economic loss, but they are also subject to psychological losses, such as losses of self-esteem, reputation, and future earning power. Since managers' losses tend to be relatively independent of the magnitude of the firm's financial losses, consistent with Kahneman & Tversky's (1979) risk preference theory, they tend to be risk seekers once failure becomes a likely outcome. Even liquidations which are reasonably asset-preserving for equity and debt holders may cause severe career losses for managers. In the early stages of decline, managers and equity holders may have conflicting interests in liquidation, with managers persevering while equity holders would profit from closing the business while it still had some value. Later, when all current equity value has been lost, equity holders and managers may have a common risk-seeking preference for firm survival at the expense of debt holders who would benefit from liquidation.

Conflicts and inertia may provide barriers to organizational action, but a declining business is in an unstable state. Eventually the business must recover or die, but interim outcomes may be hard to distinguish from permanent

transitions. Turnaround efforts may be misguided or inadequate. Symptoms may be alleviated, but root causes may remain. Treatments may have unintended effects creating new problems or exacerbating old ones. As indicated earlier, bankruptcy is not a final outcome and a strategic bankruptcy may be more a response than an outcome. The classification of an outcome as successful may be arbitrary or depend on the perspective of a particular stakeholder. A firm may emerge from bankruptcy reorganization with varying degrees of asset preservation. Reorganized Braniff was only a small fraction of its original size, but Continental emerged with its assets essentially intact. A liquidation may give some creditors full recovery and leave others little or nothing.

A Theory of Bankruptcy

The model developed above is equally applicable to business declines that lead to turnaround and recovery, and those that lead to failure and bankruptcy. It also promotes an understanding of the critical factors that determine which of these radically different outcomes actually occurs. However, it is less helpful in understanding the special circumstances of bankruptcy. It leaves unanswered such questions as when does a decline become a failure, and when and why does a failure become a bankruptcy. Bankruptcy prediction models, such as those of Altman (1983) and others, represent one approach to these problems. However, no model is completely

successful in predicting bankruptcy, and the financial models do little to explain the more fundamental underlying economic and managerial bases for business failure. Indeed, some firms collapse with little warning from their financial statements, while other firms that appear to have the characteristics of potential bankrupts turn around and recover.

Before proceeding to bankruptcy models, it may be helpful to consider some elements of a theory of bankruptcy that will place the models to be developed in perspective. The elements are:

1. A firm is a bundle of resources, outputs, and claims held together by law, contract, and consensus.

This definition of the firm is open-ended. The firm may be small or large, simple or complex. Resources include physical, human, and financial resources. Claims may or may not be be legally binding. The term claimholders is used here in the same sense that the term stakeholders is commonly used. In bankruptcy, owners, creditors, and managers receive the most attention, but there are many more stakeholders, including employees, customers, communities, and units of government. These stakeholders may pursue their claims using political pressure, as well as legal and contractual avenues.

2. If a firm is inadequately productive in using its resources, the outputs will fail to meet current claims.

The structure of the bundle and the claims on its outputs is normally established under favorable conditions, when there are reasonable expectations that all legitimate claims can be satisfied. Over time the conditions and assumptions under which the structure was established may change in ways that reduce outputs or increase claims, either of which may lead to unsatisfied claims. The causes of the loss of balance between outputs and claims may be internal or external to the firm, and they may be avoidable or unavoidable. The theory being presented is independent of the cause of the imbalance.

3. Continued failure to meet legitimate claims leads to loss of consensus and/or breach of contract.

As outputs decline or claims increase, current claims go unfulfilled. The order in which the claims go unfulfilled is subject to negotiations among the claimants, negotiations which may or may not be explicit. Consensus, contracts, and law are the basis for the negotiation, but bargaining power may reflect personal and political power as well as legal and contractual rights.

4. Loss of consensus leads to conflict and loss of

efficiency, which increase the imbalance between outputs and claims.

When consensus breaks down, strong stakeholders may impose conditions on the operation of the firm which benefit themselves, but which may be detrimental to other stakeholders. Conflict may consume resources and energy and reduce productivity. Shifting power balances may cause sudden shifts in strategy, which in turn may damage internal morale and external confidence in the firm. Continued struggle over the allocation of outputs to claimants reduces the pool of outputs to be distributed.

5. Breach of contract allows claimants to demand an unbundling of the firm.

When outputs are inadequate to meet conflicting claims, priorities must be assigned. Those priorities are based on the strength of the claimant. Some claims are enforced by threats to withdraw essential resources. Other claims may have legal or contractual standing that may be enforced by government or other external agencies. Managers play a key role in allocating outputs to claimants until there is a formal breach of contract. Breach of contract creates a condition under which bankruptcy may occur, but it does not automatically precipitate bankruptcy. A claimant may choose not to enforce a binding claim, if there is reason to

believe that the immediate or potential losses incident to enforcement of the claim outweigh the gains of enforcement.

6. Legal bankruptcy is a standardized procedure for an orderly and equitable unbundling of the firm.

Unbundling of the firm may occur without bankruptcy. A mortgage holder may foreclose on a single asset, the firm may dispose of assets, or the firm may choose to undergo total liquidation. In each case, the action is taken by mutual consent of the controlling parties. Bankruptcy is invoked when mutual consent is not obtainable. Bankruptcy law distinguishes between voluntary and involuntary bankruptcy: voluntary bankruptcy initiated by the owners and involuntary by the creditors. They are alike in that neither requires mutual consent; each is a unilateral action by the initiator. Bankruptcy law and administration is a function of government undertaken to ensure that the unbundling of the firm is orderly and equitable, and minimizes any loss to the general welfare.

7. In the bankruptcy process a wide variety of outcomes is possible, from minor readjustment of the claims to total dissolution of the bundle.

Bankruptcy law makes a clear distinction between reorganization and liquidation, but the actual outcomes are

not nearly so distinct. A firm may emerge from the reorganization process larger and healthier than it went in, or it may emerge as merely a corporate shell whose only asset is its tax attributes. Liquidation may mean the common perception of a piece-wise sale of all remaining assets leaving no visible entity. However, the bulk sale of the entire asset package to new owners, leaving productive capacities and work force essentially unchanged, would technically be a liquidation. The extent to which the claims of creditors are met is not dependent on whether the bankruptcy is a reorganization or a liquidation, but rather by the ratio of claims to assets. Bankruptcy law requires that the liquidation value of the assets relative to their value to a going concern be considered, but precise valuations of either are extremely difficult, and the results are not necessarily binding on the Bankruptcy Court or parties to the case.

8. Outcomes can be evaluated only from the perspective of each unique claimant taken over time.

At its worst bankruptcy may be a total disaster for all involved. At its best it may be only a temporary inconvenience and a launching pad to better things for all concerned. Most bankruptcies produce a unique mix of winners and losers. The most common outcome is a change in ownership. In a capitalist society owners or equity holders

are the primary bearers of business risk, of which bankruptcy is a highly visible form. If productive assets and work forces can be preserved, either through reorganization or transfer of ownership, losses may be limited to financial interests.

In evaluating outcomes and weighing losses, the time line must be considered. The duration of formal bankruptcy may be of little value in setting the time frame. The loss for equity holders frequently precedes formal bankruptcy and is spread over a series of buyers and sellers of the declining stock. Bond holders may suffer losses as credit ratings decline prior to bankruptcy and bond default. Except in cases of total liquidation of the firm, some or all of the assets of the firm are distributed to claim holders on the basis of estimates of future value, estimates which may prove to be quite inaccurate. Investments in reorganized bankrupt firms are commonly high-risk and high-return. The incidence of repeated bankruptcies by the same firm is well-established. Unlike the case of personal bankruptcy, there are no restrictions on bankruptcy of reorganized firms.

These principles define bankruptcy and set out the conditions under which it may occur, but they do not establish if in fact it will occur, and if it does, when it will occur. Bankruptcy cannot occur until there is a breach of contract, or

at least an imminent threat of breach of contract, but breach of contract does not assure bankruptcy. A firm can continue to operate even though it is technically bankrupt, as long as the claim holders maintain a consensus that it should continue.

The relationship between consensus, contract, and bankruptcy is summarized in Figure 3.3. In the first

Figure 3.3

Contracts, Consensus, and Business Continuation

Consensus Maintained?	Contractual Obligations Met? Yes	No
Yes	Normal Business Operations	Negotiated Problem Solution
No	Imposed Problem Solution	Bankruptcy

quadrant all contractual and consensual obligations are being met, so there is no business continuation problem. In the upper right quadrant one or more contractual obligations are not being met, but there is consensus among the stakeholders on actions to be taken, for example; a firm is in default on a debt, but the lender agrees to a temporary stay of action, if the firm meets certain conditions. A voluntary merger or liquidation would fall into this category. In the lower left quadrant, contractual obligations are being met, but the stakeholders are not in agreement on needed actions. In this

case the claimant that has an unmet contractual commitment can impose a solution; for example, a bank may foreclose on a piece of property even if it damages the firm severely. In the lower right quadrant the firm is not meeting its contractual obligations, and there is no agreement on a course of action. In the lower right quadrant, contractual obligations are not being met, and there is no agreement on the actions to be taken. In this case bankruptcy provides an external set of rules and a process for resolving the problem, and it may be invoked by the firm or any party whose obligations are not being met.

A Catastrophe Model of Bankruptcy

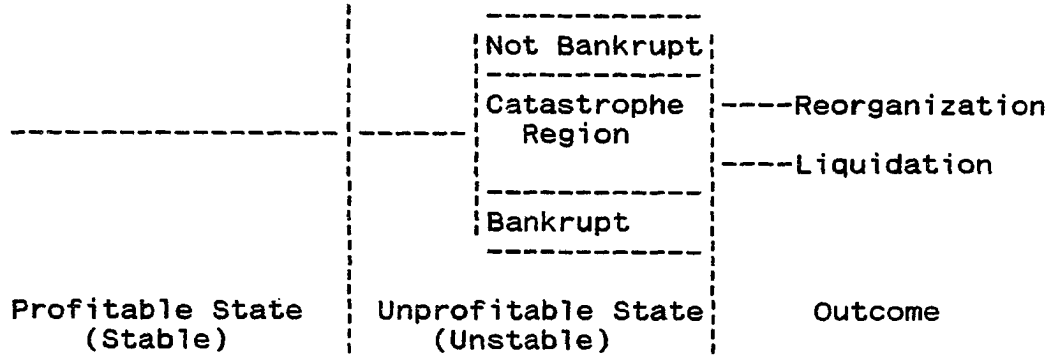
There are at least two approaches to modeling and explaining events that may or may not occur under conditions in which the event is possible, but not inevitable. They are catastrophe theory (Zeeman, 1977) and gamma change theory (Golembiewski, 1986). Both catastrophe theory and gamma change theory begin with the same three basic premises: (i) an entity can be in either of two discrete states under what appears to be the same set of circumstances, (ii) the transition from one state to another takes place essentially instantaneously, and (iii) the timing of the transition is unpredictable with precision. The model developed here is based on catastrophe theory, but it could equally well be expressed in gamma change theory terms. Gamma change theory has most frequently been

applied in the psychological and organizational behavior literature. For example Golembiewski (1986) used gamma change theory to describe burnout and job-quitting behavior under stressful working conditions.

Figure 3.4 shows a simplified state model for the bankruptcy/failure model using catastrophe theory

Figure 3.4

Failure-Bankruptcy State Model



terminology. The first step in building a state model is to assume that a business can exist in one of two states, one profitable and the other not, and that the transition from one to the other is a smooth, continuous pathway. The profitable state is stable, although the degree of profitability may be quite variable, and a firm may even be an economic failure in that it fails to provide an adequate return. A profitable firm may choose to go out of existence through liquidation, merger, or acquisition by another firm. However, any such action is the result of a voluntary decision by the owners, even in the case of an "unfriendly" takeover, which may be resisted by

management.

An unprofitable business is in an unstable state, although the firm may continue in the state for extended periods of time, if the losses are relatively small. This instability serves as a basis for Wilcox's (1976) "gambler's ruin" bankruptcy model. In the unstable unprofitable state there are a number of possible outcomes, not all of which are under the control of the owners. The most desirable outcome is a return to a stable profitable state. At certain times and under certain conditions, the unprofitable firm may voluntarily choose to liquidate, merge, or sell out to another firm, but if it fails to act on a timely basis, either the firm will wither away or external forces will take control via foreclosure or bankruptcy.

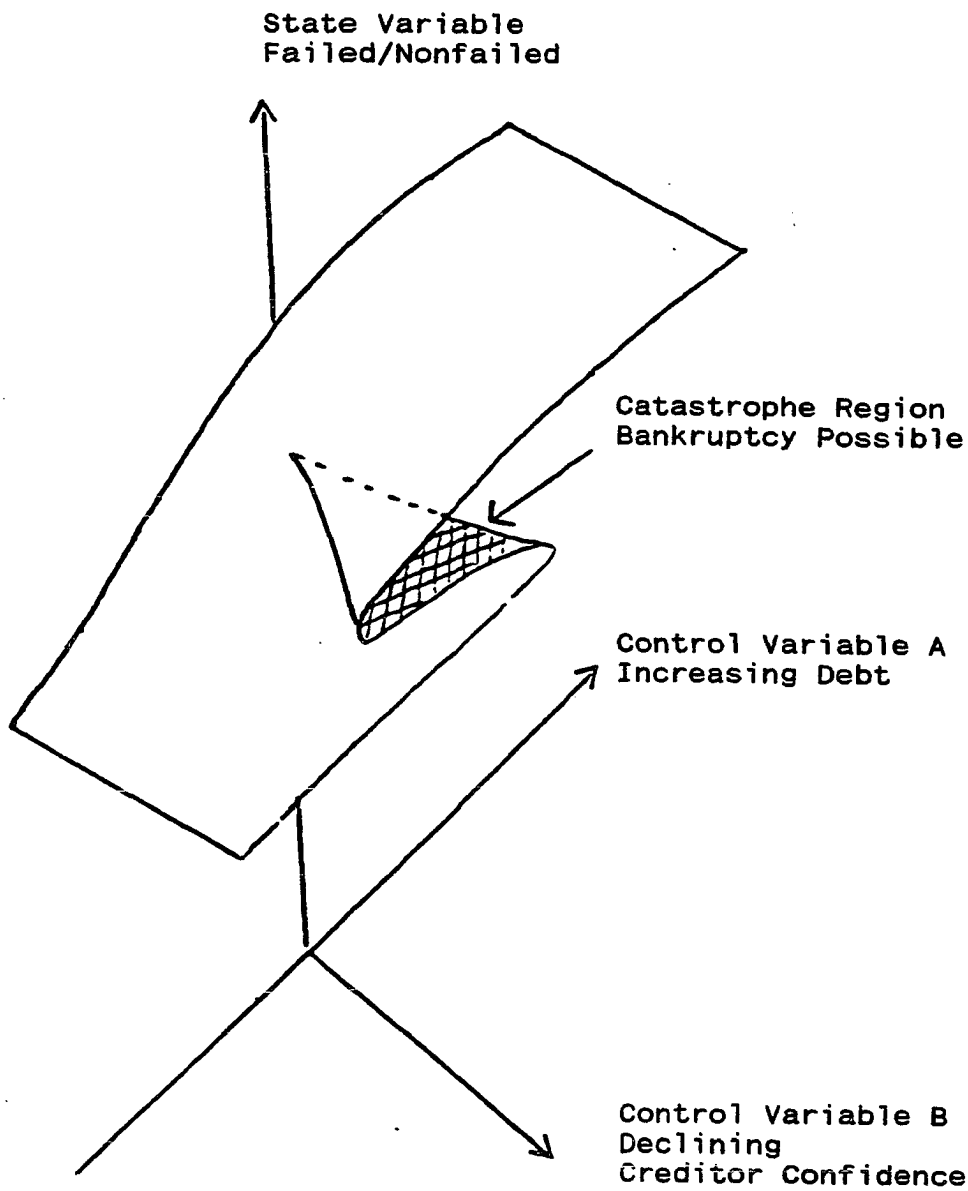
If the unstable unprofitable state persists, the firm will move to a region in which there are two possible substates, legally bankrupt or not. Here the firm is not only unprofitable, but it is also definitionally bankrupt by either equity or cash flow definitions. Being definitionally bankrupt is a necessary condition for legal bankruptcy, but it is not sufficient. The bankruptcy must be triggered by a volitional act of either the firm or its creditors. The transition, if it occurs, is noncontinuous and essentially irreversible. Such a transition is the subject of catastrophe theory, and it has been observed and studied in a wide variety of sciences,

including engineering, biology, sociology, and economics. Zeeman (1977) has been a leading figure in applications of the mathematical theory, and Scapens, Ryan, & Fletcher (1981) have applied the theory to bankruptcy. Two features of catastrophe theory are important even for simple qualitative applications. First, catastrophe theory models assume that there are continuous gradual pathways which lead to the same outcomes as the catastrophic transitions. Second, the theory allows for specification of regions in which the catastrophe may or may not occur, but it does not provide a basis for predicting either the exact location or the timing of catastrophic transitions. For example, while a bridge will not collapse unless it is overloaded, two identical bridges may be equally overloaded, yet one will collapse and the other will not. Two firms may be equally unprofitable and debt-ridden, but one will go into bankruptcy and the other will not.

One form of catastrophe model, the cusp model, can be represented in three-dimensional space by two control variables and a state variable. This is shown in Figure 3.5. In a simple example the state variable could be bankruptcy, and the control variables could be an objective debt measure and creditor confidence. The only region in which the catastrophe bankruptcy can occur is the region in which the liabilities exceed the net worth of the firm. If a firm has no creditors, it may decline to zero value, but it cannot be forced into

Figure 3.5

Failure-Bankruptcy Catastrophe Model



bankruptcy. With creditors, the fact that liabilities exceed assets, or that current claims exceed cash inflow, does not automatically lead to bankruptcy. However, given either of these conditions even a minor creditor can precipitate bankruptcy. Or conversely, an external intervention, such as occurred with the Chrysler Corporation rescue, may prevent it. In terms of the state model, bankruptcy prediction models can be seen as attempts to describe the region in which bankruptcy is likely to occur and to predict whether it will occur or not. Bankruptcy may be incorrectly predicted when the conditions are ripe for bankruptcy, but for some unexplained reason the catastrophic transition does not occur.

It should be noted that bankruptcy is not a final outcome, but rather a temporary state which eventually leads to the same outcomes facing unsuccessful firms which do not go bankrupt: the firm is liquidated, sold to others, returns to profitability, or some combination of the above. If the firm is reorganized under Chapter 11 of the Bankruptcy code, there is often a partial liquidation of assets with the surviving firm being diminished in size. Although the outcomes may be the same in bankruptcy as in nonbankruptcy endgames, bankruptcy does greatly affect the path to the final outcome by transferring primary control from the owners to the creditors and the Bankruptcy Court. This is appropriate since in a number of different ways bankruptcy can be seen as a management/ownership failure. Initially the firm failed to be

profitable, then it failed to turn around, and finally it failed to find an asset-preserving endgame.

Mathematical Bankruptcy Prediction Models

Bankruptcy prediction models will be discussed in greater detail in a subsequent chapter, so the only discussion here will be limited to making the link between the bankruptcy theory and catastrophe model, which have just been described, and mathematical bankruptcy prediction models.

The basis for all bankruptcy prediction models is a comparison of the characteristics of a sample of bankrupt firms prior to bankruptcy with the characteristics of a sample of nonbankrupt firms. This information is then used to classify the firms in the combined sample or for building a model which can be used to predict whether a firm not in the samples will go bankrupt. In terms of the bankruptcy theory and catastrophe model developed above, the models attempt to predict when a firm will enter a state in which bankruptcy is possible and the probability of its occurring once that state is reached. Consistent with catastrophe theory, prediction models cannot be used to determine with certainty whether a particular firm will go bankrupt or when it will go, if it does. Errors in prediction occur when a firm either makes a successful turnaround and does not reach the state where bankruptcy can occur, or the firm reaches that state and does not go bankrupt.

If the firm is in the bankruptcy region, it can turn around until the catastrophe, bankruptcy, occurs.

Chapter Summary

The major elements of this chapter are incorporated into the models on pages 35, 51, and 54. The first model, a decline process model, emphasizes the following points. Business failure and bankruptcy have causes both external and internal to the firm. The external causes may be unavoidable, but the effects on the firm are largely the result of managerial responses to external stresses, although some outcomes may be beyond managerial control. Primary strategic effects are made evident by secondary financial effects. The model allows for both successful turnarounds and business failures.

If a declining firm is unable to meet the legitimate claims of its stakeholders, the stakeholders may either renegotiate their claims or drive the firm into bankruptcy. The act of bankruptcy, which is not completely predictable, may be seen as an example of the class of events which can be best understood in terms of catastrophe theory. Bankruptcy is not a final outcome of business failure or stakeholder conflict; rather it sets in motion another set of rules for resolving conflicts and equitably distributing the assets of the failing firm.

Chapter 4

BANKRUPTCY PREDICTION MODELS AND CLASSIFICATION PROCEDURES

Introduction

The research design for this study called for extensive use of the Altman (1983) bankruptcy prediction model and its variables as a mechanism for exploring the characteristics of the failing firms and the matching sample. This chapter is devoted to the testing and reformulation of the Altman model. A test of the stability of the model over time and across industries using a sample of one hundred firms in five industries at four five-year intervals will be described. The success of the original and reformulated Altman models in predicting bankruptcy up to five years before the event will be reported.

The Altman model was developed using MDA (multiple discriminant analysis) techniques, but some researchers have suggested that logit and probit models are better statistical techniques than MDA for bankruptcy prediction models. Comparisons of the success of the alternative techniques using the research sample will be reported, along with the effect of using different matching samples of nonfailing firms.

Bankruptcy Prediction Models Development

Bankruptcy prediction has been a dominant theme in the study of business failure since 1967, when Beaver (1967) published his work on the use of ratio analyses for bankruptcy prediction. In the following year Altman published his multivariate Z-score model, which quickly became the standard for both academics and practitioners. As examples, Chakravarthy (1986) has used Z-scores in his work on measuring corporate performance, and Foster (1986) recommends the use of Z-scores in his standard work on financial statement analysis. The interest in Z-scores in banking and finance has been expanded by their application to credit-scoring, a field that is bankruptcy related, but much broader.

Although Altman's Z-score model has had a long record of success, it has not been without its critics and problems. Altman's model and other ratio analyses have been criticized for their brute empiricism and lack of theoretical underpinnings (Joy & Tollefson, 1975; Ball & Foster, 1982). On the practical side there are a number of concerns about the data on which the model was based. The sample was small, 33 bankrupt and 33 nonbankrupt firms. The firms in the sample were relatively small; mean assets of the bankrupt firms was $6.4 million, with a range of $0.7 million and $25.9 million. The firms filed for bankruptcy between 1945 and 1965. Since that time, in addition to whatever changes there have been in

financial markets and standards, the U. S. Bankruptcy Code underwent major revision in 1978.

Since the publication of the original Altman model, there have been a number of attempts to improve on the model or to develop alternative models. Altman has reviewed some of the major attempts in his 1983 book, Corporate Financial Distress, and those detailed reviews will not be duplicated here. Some of that work emphasized the search for theory-based models, responding to criticisms of Altman and others for their brute empiricism. One of these efforts, Wilcox's (1976) "gambler's ruin" model, was based on the general proposition that the probability of bankruptcy is related to the probability that annual cash flows will cause the net liquidation value of the firm to become negative. The model has had some success, and at least at one time was provided as a commercial service. The coefficients of the original Altman model were reevaluated by Moyer (1977), but his work has received little attention and has had no impact on the the applications of the model.

Much of the other work on bankruptcy prediction models has been devoted to either improving the variables by using more sophisticated accounting definitions or by adjusting the models to fit special situations, such as small businesses, privately held firms, banks, and railroads. The most successful of these improved models has been the ZETA model (Altman, Haldeman, & Narayan, 1977). In his 1983 book Altman describes the model

and reports some results from its use. The model utilizes capital lease and preferred stock data, as well as some statistical trend data. However, the coefficients of the variables are proprietary information, and the data base on which the model is based is not publicly available. The rights to the ZETA model are held by a private consulting firm, ZETA Services, Inc. (Mountainside, NJ). The ZETA model was based on bankruptcies from 1969 to 1975, and the firms were much larger than those in the original study. The model is regularly revised and updated. In a comparison study of the available models Scott (1981) concluded that the ZETA model was the most successful model available at that time.

A continuing issue in bankruptcy prediction is the importance of cash flow measures. The practical importance of cash flow has long been recognized, but there is less agreement on how to use cash flow data in bankruptcy studies. Largay & Stickney (1980) analyzed the role of cash flow in the W. T. Grant bankruptcy and advocated greater attention to analysis of cash flows. Gentry, Newbold, & Whitford (1985a, 1985b, 1985c, 1987) developed a sophisticated bankruptcy prediction model based on funds flow variables.

On the basis of the evidence available, the following conclusions appear reasonable:

1. All of the statistical models are reasonably good predictors of bankruptcy one year before bankruptcy. The

same is true for naive judgmental predictions (Libby, 1975).

2. The performance of all the models declines rapidly and nonlinearly as the prediction lead time increases. The predictive ability of the models improves, if the models are reestimated for each prior year, rather than using year one coefficients with prior year data (Scott, 1981). This finding has useful implications for theory, but it cannot be used in the typical prediction application, since the necessary comparison samples are not available.

3. The original Altman model has been remarkably robust over time, and its overwhelming acceptance as the model of choice dominates any advantage of marginally improved models in most applications. Financial institutions and corporations whose prime interest is in predictive accuracy, and who are not interested in data comparability, may find the commercial ZETA service a worthwhile improvement.

4. New models, particularly the funds flow models, may prove useful in providing alternative views of financial strength and vulnerability to bankruptcy, even if they do not achieve wide acceptance as first choice screening techniques.

5. Alternative models, even if not accepted in practice, can make useful contributions to theory building.

Computational Developments

The development of the Altman's original multivariate model, and other multivariate models, was facilitated by the increasing availability of the necessary computer software for performing the calculations. Since Altman's original work, statistical software packages have simultaneously increased in mathematical sophistication and accessibility to researchers with limited technical skills. One major thrust has been the development of logit and probit models to supplement multiple discriminant analysis classification models. Altman, Avery, Eisenbeis, & Sinkey's 1981 book, Applications of Classification Techniques in Business, Banking and Finance provides an extended review of these developments. A more detailed review of some of the developments germane to this study are provided in separate sections which follow the description of the research objectives of the model valuation study.

Research Questions about the Altman Model

The use of the Altman Z-score model as a major tool for this business failure-bankruptcy study was established early in the research design. This decision was based on the intrinsic appeal of the model and on its wide acceptance in academic research and in business practice. As the research proceeded, the questions about the model became increasingly cogent, and at the same time it was recognized that the data which had been

collected were sufficient to reevaluate Altman's model. Because the reevaluation of the model was ancillary to the major thrust of the research, the scope of the work plan was limited. In particular it should be noted that no attempt was made to substitute new variables for those in the Altman model or to compare the Altman model with other models, such as the Gentry, Newbold, & Whitford (1987) funds flow model. The research questions which were pursued were the following:

1. Is the use of the original Altman coefficients justified this long after the model was developed?

As indicated above the original Z-score model was based on bankruptcies in the period from 1946 to 1965, and the coefficients published in 1968 have continued in use unchanged, at least by academic researchers without access to the ZETA service.

2. Are the Altman Z-score model and its variables stable over time?

This question is related to the previous question, but the focus here is on whether the financial ratios on which the Altman model is based remain stable over time. This issue has been addressed by Scott (1981) and Dambolena & Khoury (1980), and both found that financial ratios and bankruptcy prediction variables are not stable over time.

3. Are the Altman Z-score model and its variables uniform across industries?

The original model was based on manufacturing firms. Altman (1983) reports that the proprietary ZETA model was applicable to retailing firms as well as manufacturing firms, but no systematic study of the applicability of the model across industries has been reported.

4. Will the Altman model provide accurate classifications for larger firms?

As in the case of industry effects, no direct evidence is available, but as in the industry case, Altman reports that the ZETA model was developed using data from much larger firms.

5. Are classification results affected by sample size and matching sample selection rules?

Given the relatively small number of bankrupt firms for which public information is available, sample size has been and will continue to be a problem. The number of candidates for inclusion in nonbankrupt comparison samples is not similarly restricted, but the selection of the matching sample raises other questions. Should the comparison samples be of equal size? If not, how large should the matching sample be? How closely should the comparison firms be matched to the bankrupt firms? There are no hard and fast rules about samples sizes in multidiscriminant analysis, but a common rule of thumb among statisticians is to have ten times as many cases as independent variables

(Green & Tull, 1975), a standard not met by Altman with 33 cases and five variables.

The Altman model was developed using equal-size samples (n=33). The comparison firms were a random sample stratified by industry and asset size. Gentry, Newbold & Whitford (1987) also used equal-size samples (n=35) matched for industry and size. However Zmijewski (1983) has raised serious questions about using equal-size samples when they are drawn from populations that are very unequal in size.

6. Will logit or probit techniques provide more accurate predictive results?

Logit and probit models provide results which are more readily interpretable than multiple discriminant analysis, but the evidence on predictive power is not conclusive (Lo, 1986)

No attempt to develop hypotheses about the outcomes was made, as the primary purpose of the work was to improve the analytical tools used in subsequent parts of the study. Significant prior research, research design, and findings for each question are reported below.

Reevaluation of the Altman Model

The Altman Z-score model is:

Eq. 1 $Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5$

where

X1 = working capital/total assets

X2 = retained earnings/total assets

X3 = EBIT/total assets

X4 = market value of equity/total liabilities

X5 = sales/total assets.

The cutoff score for the model is 2.675, with bankruptcy predicted for firms with scores below that value. Altman defined the 1.81 to 2.99 range as a gray area, a region in which misclassifications are frequent.

In this study the Altman Z-score model was recalibrated using a sample of 73 bankrupt firms and 73 matching firms. The procedures for selecting the samples are described in Chapter 5. The statistical computations were performed using the SAS discriminant analysis program.

The procedure was run using both pooled and within-group covariance matrices. On purely statistical grounds discriminant analyses should be run using within-group covariance matrices, if the matrices are not approximately equal. When the pooled covariance matrix is used, the

classification model is linear; when within-covariance matrices are used, the model is quadratic. The arguments for using the quadratic model are summarized in Altman, Avery, Eisenbeis, & Sinkey (1981, pp. 126-129). Although a test for equality of the matrices indicated they were not equal, the use of the pooled matrices gave better classification results, as is shown in Table 4.1. As a result the pooled covariance matrices were used after that test had been completed. Altman (1983, pp. 135-136) faced the same "dilemma," and chose to use the linear model in his work. The linear model also has the advantage of making possible the computation of the Fisher discriminant coefficients used in most applications of Z-score models.

Table 4.1

Hit Rates for Various Prediction Models and Matching Samples

MATCHING SAMPLE--73 MATCHED FIRMS

Discriminant Analysis--Percent Correct

	Five Variables			Two Variables		
	Pooled Covariance Matrices					
Year	NBR	BR	All	NBR	BR	All
1.00	87.67	89.04	88.36	86.30	89.04	87.67
2.00	73.97	80.82	77.40	75.34	79.45	77.40
3.00	72.60	67.12	69.86	68.49	76.71	72.60
4.00	69.86	69.86	69.86	65.75	78.08	71.92
5.00	63.01	67.12	65.07	61.64	72.60	67.12
6.00	67.12	65.75	66.44	64.38	69.86	67.12
Average	72.37	73.29	72.83	70.32	77.62	73.97

Probit Analysis--Percent Correct

	Five Variables			Two Variables		
Year	NBR	BR	All	NBR	BR	All
1.00	84.93	83.56	84.25	84.93	86.30	85.62
2.00	75.34	80.82	78.08	75.34	79.45	77.40
3.00	73.97	69.86	71.92	69.86	75.34	72.60
4.00	69.86	72.60	71.23	67.12	78.08	72.60
5.00	61.64	65.75	63.70	61.64	72.60	67.12
6.00	68.49	65.75	67.12	64.38	71.23	67.81
Average	72.37	73.06	72.72	70.55	77.17	73.86

Logit Analysis--Percent Correct

	Five Variables			Two Variables		
Year	NBR	BR	All	NBR	BR	All
1.00	86.30	84.93	85.62	86.30	84.93	85.62
2.00	68.49	73.97	71.23	69.86	76.71	73.29
3.00	73.97	68.49	71.23	71.23	76.71	73.97
4.00	69.86	72.60	71.23	67.12	79.45	73.29
5.00	61.64	67.12	64.38	63.01	72.60	67.81
6.00	65.75	65.75	65.75	64.38	71.23	67.81
Average	71.00	72.14	71.57	70.32	76.94	73.63

Table 4.1 (cont.)

Hit Rates for Various Prediction Models and Matching Samples

MATCHING SAMPLE--73 MATCHED FIRMS

Discriminant Analysis--Percent Correct
Using Within Covariance Matrices
(All Other Analyses Used Pooled Covariance Matrices)

	Five Variables			Two Variables		
Year	NBR	BR	All	NBR	BR	All
1.00	84.93	79.45	82.19	64.38	95.89	80.14

Matching Sample--1276 Not Matched Firms
Discriminant Analysis--Percent Correct

	Five Variables			Two Variables		
Priors	NBR	BR	All	NBR	BR	All
Prop	98.75	26.03	94.81	98.51	16.44	94.07
.5/.5	88.71	69.86	87.69	83.07	65.75	82.13

Probit Analysis--Percent Correct

	Five Variables			Two Variables		
Year	NBR	BR	All	NBR	BR	All
1.00	99.53	28.77	95.70	99.61	15.07	95.03

Logit Analysis--Percent Correct

	Five Variables			Two Variables		
Year	NBR	BR	All	NBR	BR	All
1.00	99.04	31.51	95.33	99.22	26.03	95.26

Table 4.1 (cont.)

Hit Rates for Various Prediction Models and Matching Samples

MATCHING SAMPLE--73 FIRMS SELECTED AT RANDOM FROM THE 1276
Discriminant Analysis--Percent Correct

	Five Variables			Two Variables			
Sample	NBR	BR	All	NBR	BR	All	Mean* Total Assets
1	83.56	83.56	83.56	80.82	83.56	82.19	1454
2	83.56	79.45	81.51	83.56	79.45	81.51	1220
3	83.56	87.67	85.62	82.19	82.19	82.19	1799
4	83.56	83.56	83.56	84.93	83.56	84.25	1416
5	82.19	83.56	82.88	75.34	83.56	79.45	1265
6	83.56	79.45	81.51	76.71	80.82	78.77	932
7	79.45	90.41	84.93	73.97	93.15	83.56	917
8	79.45	87.67	83.56	79.45	91.78	85.62	900
9	82.19	83.56	82.88	80.82	82.19	81.51	756
10	84.93	82.19	83.56	73.97	87.67	80.82	540
Mean	82.60	84.11	83.35	79.18	84.79	81.98	1120

Comparative Total Assets

Large Sample (n = 1276)	1529
Bankrupt Firms (n = 73)	380
Matching Firms (n = 73)	354

*All assets in millions of $.

Table 4.1 (cont.)

Hit Rates for Various Prediction Models and Matching Samples

Probit Analysis--Percent Correct

	Five Variables			Two Variables		
Sample	NBR	BR	All	NBR	BR	All
1	84.93	95.89	90.41	80.82	95.89	88.36
2	84.93	93.15	89.04	86.30	94.52	90.41
3	86.30	95.89	91.10	86.30	95.89	91.10
4	86.30	94.52	90.41	86.30	95.89	91.10
5	80.82	93.15	86.99	76.71	95.89	86.30
6	82.19	91.78	86.99	79.45	93.15	86.30
7	82.19	95.89	89.04	84.93	94.52	89.73
8	84.93	93.15	89.04	79.45	95.89	87.67
9	80.82	90.41	85.62	82.19	91.78	86.99
10	82.19	91.78	86.99	79.45	94.52	86.99
Mean	83.56	93.56	88.56	82.19	94.79	88.49

Logit Analysis--Percent Correct

	Five Variables			Two Variables		
Sample	NBR	BR	All	NBR	BR	All
1	86.30	94.52	90.41	86.30	95.89	91.10
2	87.67	93.15	90.41	87.67	94.52	91.10
3	86.30	94.52	90.41	87.67	95.89	91.78
4	86.30	94.52	90.41	86.30	95.89	91.10
5	83.56	94.52	89.04	79.45	95.89	87.67
6	84.93	93.15	89.04	82.19	94.52	88.36
7	79.45	95.89	87.67	82.19	94.52	88.36
8	86.30	94.52	90.41	79.45	95.89	87.67
9	82.19	93.15	87.67	83.56	91.78	87.67
10	87.67	93.15	90.41	82.19	94.52	88.36
Mean	85.07	94.11	89.59	83.70	94.93	89.32

Relative Importance of Variables

Stepwise discriminant analysis of the data for year one indicated that only X2, retained earnings/total assets, and X4, market value of equity/total liabilities, made significant contributions to the model, so a two-variable model was estimated, as well as the five-variable Altman model. The coefficients for the original Altman model (Eq. 1), for the reevaluated model (Eq. 2), and for the new two-variable model (Eq. 3) are shown below. In this and all other formulas, Z indicates the original Altman score, and NZ5V and NZ2V indicate the revised model scores developed in this study.

Eq. 1 $Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5$

Eq. 2 $NZ5V = 0.72X1 + 3.26X2 + 0.41X3 + 0.69X4 - 0.08X5$

Eq. 3 $NZ2V = 3.84X2 + .70X4.$

The coefficients shown in equations 1, 2 and 3 above are based on the raw unstandardized data, and as such the contribution of each variable cannot be directly determined. Several methods are available for estimating the relative importance of the variables. One way is to standardize the data before performing the discriminant analysis, another is to compare the univariate F-values, and another is to use a stepwise discriminant procedure. All of these techniques were applied with comparable results. The variables found to be significant using the SPSS stepwise discriminant analysis

program and their standardized coefficients are shown in Table 4.2.

Table 4.2

Standardized Discriminant Function Coefficients
(Stepwise Procedure---F > 1 to enter or stay)

	Years before Bankruptcy					
Variable	1	2	3	4	5	6
X1						.321
X2	.734	.542	.686	.664	.600	1.000
X3		.410	.526	.357		
X4	.519	.357		.317	.353	
X5					-.346	

Prediction Accuracy Two to Six Years before Bankruptcy

The coefficients shown in equations 1, 2, and 3 above are derived from data on the bankrupt firms from the last available annual report before bankruptcy. It is common to use Z-scores based on final-year coefficients to predict bankruptcy based on data before the final year. This practice has the advantage of requiring data gathering for only one year for the matching firms, but it injects the assumption that the relationship between the variables is stable over time, which, as indicated previously, may be a problem. Also the pattern of changes in the variables over time may be useful in understanding the decline process. The data were available for six years before bankruptcy for both the bankrupt and nonbankrupt firms, so the analysis was repeated for each year. The raw and standardized coefficients and the significant variables as determined by step-wise discriminant analysis are shown in Table 4.2. The

prediction accuracies for each year are shown in Table 4.1, along with the results of the probit and logit analyses described below.

In order to test the effect of using a new model for each year, bankruptcy classifications for the firms in the bankrupt sample were made using both the discriminant analyses based on data for the year under consideration, and those based on Z-scores calculated using the same financial data, but using final year coefficients and cutoff scores, the procedure used by Altman and others. The classification results observed are displayed in Table 4.3.

Table 4.3

Hit Rates Using Year-One Model Cutoffs

73 Bankrupt Firms and 73 Matched Nonbankrupt Firms

	Five Variables Cutoff = . 995		Two Variables Cutoff = . 995		Altman Z-Score Cutoff = 2.675	
Year	NBR	BR	NBR	BR	NBR	BR
1	87.67	89.04	86.30	89.04	76.71	72.60
2	83.56	71.23	84.93	67.12	76.71	67.12
3	82.19	53.43	82.20	52.05	76.71	50.68
4	83.56	45.21	84.93	47.95	76.71	47.95
5	78.08	50.68	78.08	50.68	75.34	36.99
6	78.08	52.05	82.19	49.32	74.45	35.62
Ave.	82.19	60.27	83.10	59.36	76.11	51.83

Comparing these results with those shown in Table 4.1, which were calculated using six separate matched-year models, it can be seen that the predictions based on a single period model cutoff score are less accurate than those made using a

reestimated model for each year. It is particularly important to note that with the annually reestimated models, the hit rates are about equal for bankrupt and nonbankrupt firms, but using the year-one model, the hit rate for bankrupt firms declines much more rapidly that that for nonbankrupt firms. This result is of interest theoretically, but is of no practical use for ex-ante predictions in which neither the probability of bankruptcy nor its timing is known. The literature on bankruptcy prediction tends to treat the declining power of prediction as a model deficiency. However, from a strategic management point of view, this is just another indicator of the dynamic behavior of firms. Predicted bankruptcies that do not occur may be the result of deliberate turnaround strategies or changing environments. Unpredicted bankruptcies may be the result of rapid declines of previously profitable businesses caused by bad business decisions or catastrophic external events.

As shown in Table 4.1, the two-variable model on average performed slightly better than the five-variable model. This observation, which is superficially counter-intuitive, is consistent with the findings of others. Pinches (1980) summarized these findings, and others, in his extended review of factors to be considered in using MDA. The effect that number of variables has on classification accuracy interacts with sample size, variable correlations, and the extent that the variables are multivariate normal, or not. As a

consequence, it is difficult to draw conclusions about the effects of changes in any of the interacting factors on the observed classification accuracy. In most practical applications of MDA for classification, a reduction in the number of variables required is an advantage.

Research Conclusions about the Altman Model

The most immediate conclusion is that the basic Altman model has stood the test of time very well, but its performance can be improved by reestimating the parameters for new time periods or situations. Using the old coefficients the model correctly predicted 72.60 % of the bankrupt firms and 76.71% of the nonbankrupt firms. Using the model with newly estimated coefficients, the correct predictions increased to 89.04% for bankrupt firms and 87.67% for nonbankrupt firms, a significant increase. Of greater interest was the success of the two-variable model in predicting bankruptcy. From the data shown Tables 4.1 and 4.3, it can been seen that the results using the two-variable model are nearly indistinguishable from those using the five-variable model.

In understanding the results obtained by the use of the multivariate model, it is useful to look at the univariate data. Here there are some significant differences between Altman's (1968) findings and the present study. The relative importance of the individual variables can be estimated by

looking at the univariate F values, or it can be done better by either standardizing the data or using stepwise analyses. In both Altman's study and the present work, the F-values for the first four variables were significant at a $p < .001$, and the F-value for X5 was not significant. However the results from using standardization techniques were quite different. Using a scaled vector technique, Altman found the the relative importance of the variables to be: X3 > X5 > X4 > X2 >> X1. Using standardized coefficients, this study found the relative importances to be: X2 > X4 >> X1 >> X5 = X3. Given the comparable predictive success of the two models using the different coefficients, the differences in the relative importance of the variables is somewhat surprising. The dominance of X2 was a consistent finding of this study, as indicated by the success of the two-variable model throughout the prebankruptcy period and the finding that only X2 was significant six years before bankruptcy. Altman (1983) reports a similar dominance for X2 in his ZETA model. Some of the other differences may be timing effects. In a number of ways the behavior of the firms in this study at year one are similar to those for year two of Altman. In this study X3 was more important in years two and three than in year one, and X1, which was least important to Altman, became important here only in the final year. Altman attributed the high contribution of X5 to its high negative correlation with X3, -.78, for the bankrupt firms. In this the study the correlation was only an insignificant -.08.

Model Stability over Time and across Industries

In order to test the stability of Z-scores and related financial factors across industries and over time, five industry groups were studied at five-year intervals from 1970 to 1985. First, the composite Altman model Z-score and the five ratios used in the model were calculated. In addition to the Z-score ratios, four other commonly used performance ratio variables were included in the analysis. They were the traditional accounting-based measures, ROI (return on investment), and ROE (return on equity), and two market-based ratios, M/B (market-to-book value), and P/E (price earnings ratio). Net sales and total assets for each case were also recorded for subsequent analysis.

The sample consisted of twenty firms in each of five industry groups taken from the Compustat data base. The industries and the Compustat industry codes are shown in Table 4.4. The industries selected were those with large representation in the bankrupt firm sample, except for the drug industry, a stable and highly profitable industry, which was selected to provide maximum contrast. Also, the drug industry had previously been identified by Bettis & Hall (1982) as an unusually high performer in previous structure/performance studies.

Only firms with complete data for 1970, 1975, 1980, and

1985 were used. In the case of the drug firms, only twenty firms on the Compustat file had complete data. In all other cases the firms were picked at random, with firms with missing data dropped, until twenty complete cases were available. In the drug, machinery, retail, and textile industries, about two-thirds of the firms on the Compustat file had complete data. In the oil and gas industry, only about one-third of the firms had complete data, indicating a high rate of firm exit and entry in that industry.

The sample covered a wide range of firm sizes. Total assets ranged from $1.23 million to $11,585 million, with a mean of $630 million. Net sales ranged from $0.43 million to $19,651 million with a mean of $944 million. On average, the drug and retail firms were much larger than the oil and gas firms, which were larger than the machinery firms and the textile firms.

The ratios were calculated using the same program which extracted the required raw data from the Compustat file. The stability of the ratios was tested using the ANCOVA model in the GLM procedure of SAS. In each case the statistical model included an industry-year interaction term and total assets as a covariate. The procedure also supplied Scheffe multiple comparisons of means for main effects.

The Z-scores, the Z-score underlying variables, and the

related financial variables were analyzed to determine whether there were significant differences across industries and over time. In these analyses size effects were controlled by using an ANCOVA model with total assets as the covariate. The results of the ANCOVA analyses are shown in Table 4.5. With few exceptions, the interaction effects were not statistically significant, and when they were, the interaction-effect F-values were low compared to main-effects F-values. The covariate, total assets, was significant for most variables, but generally less significant than industry effects. Tables 4.6 and 4.7 give the Scheffe comparison of means tests for industry and year effects. The specific individual results, whether for variables, industries, or years, are less interesting than the overall patterns and relationships. Industry participants and analysts will find little that is surprising for their own industries, but the findings are important to researchers doing industry cross-sectional or longitudinal studies. In looking at the results, three major factors emerge, namely industry effects, time period effects, and market effects. These are discussed in the following sections.

Table 4.4

Industry Groupings
(By Compustat Codes)

I. Drug Industry

1. 2830 Drugs
2. 2831 Biological Products
3. 2834 Pharmaceutical Preparations

II. Machinery Industry

1. 3510 Engines and Turbines
2. 3520 Farm and Garden Machinery and Equipment
3. 3530 Construction, Mining, Material Handling Equipment
4. 3531 Construction Machinery Equipment
5. 3533 Oil Field Machinery and Equipment
6. 3540 Metal Working Machinery and Equipment
7. 3550 Special Industry Machinery
8. 3558 Pollution Control Machinery
9. 3560 General Industrial Machinery and Equipment

III. Oil and Gas Industry

1. 1311 Crude Petroleum and Natural Gas
2. 1381 Drilling Oil and Gas Wells

IV. Retail Store Industry

1. 5311 Retail Department Stores
2. 5331 Retail Variety Stores
3. 5411 Retail Grocery Stores
4. 5621 Retail Women's Ready-to-Wear
5. 5661 Retail Shoe Stores
6. 5912 Retail Drug and Proprietary Stores
7. 5949 Retail Sewing and Needlework Stores

V. Textiles and Apparel Industry

1. 2200 Textile Mill Products
2. 2250 Knitting Mills
3. 2300 Apparel and Other Finished Products

Table 4.5

Results of the ANCOVA Analyses
(F Values and Probabilities)

Variable	Main Effects Industry	Year	Interaction Industry*Year	Covariate Total Assets
Altman's Bankruptcy Prediction Model Variables				
X1-WC/TA	123.06 .0001	4.42 .0045	.70 .7562	.25 .6198
X2-RE/TA	19.3 .0001	3.32 .02	.59 .854	11.41 .0008
X3-EBIT/TA	17.69 .0001	11.39 .0001	2.16 .0129	12.51 .0005
X4-Eq/Debt	23.6 .0001	3.49 .0158	1.30 .2168	1.90 .1685
X5-Sales/TA	88.65 .0001	.52 .6660	.19 .9989	1.84 .1758
Z-Score	22.55 .0001	3.34 .0194	1.44 .1440	1.10 .2939
Other Variables				
TAss(MM$)	13.52 .0001	11.97 .0001	1.62 .0837	
Sales(MM$)	22.28 .0001	.99 .3995	1.86 .0381	999.79 .0001
ROI(%)	12.59 .0001	15.08 .0001	2.38 .0057	9.08 .0028
ROE(%)*	3.35 .0103	14.25 .0001	3.19 .0002	10.04 .0017
Mkt/Book*	42.59 .0001	11.75 .0001	5.00 .0001	3.99 .0464
P/E Ratio**	.92 .4536	4.34 .0051	.94 .5054	2.41 .1217

* Excludes one retail and three oil firms with negative equity in a given year.
** Excludes 8 drug, 11 machinery, 14 oil, 3 retail, and 9 textile firms with negative earnings in a given year.

Table 4.6

Means and Scheffe Groupings by Industry

	MEANS						SCHEFFE GROUPS
	Combined	Drugs	Machine	Oil&Gas	Retail	Textiles	
Variable	Altman's Bankruptcy Prediction Model Variables						
X1-WC/TA	.305	.327	.390	.047	.288	.469	T,M,DR,O
X2-RE/TA	.324	.413	.326	.159	.320	.400	DTMR,O
X3-EBIT/TA	.109	.179	.087	.083	.097	.098	D,TRMO
X4-Eq/Debt	3.010	7.764	1.658	2.715	1.369	1.544	D,OMTR
X5-Sales/TA	1.482	1.136	1.296	.496	2.881	1.603	R,TM,MD,O
Z-Score	4.466	7.356	3.502	2.678	4.816	3.979	D,RTM,TMO
	Other Variables						
TAss(MM$)	631	1175	164	584	1011	218	DR,RO,OTM
Sales(MM$)	944	1221	198	565	2416	320	R,D,OTM
ROI(%)	5.16	9.73	3.47	3.72	4.53	4.35	D,RTOM
ROE(%)*	9.24	14.58	5.70	7.56	10.84	7.50	D,ROTM
Mkt/Book*	1.85	3.61	1.25	2.15	1.33	.98	D,O,RMT
P/E Ratio**	20.46	19.68	20.72	27.17	16.83	18.67	OMDTR

* Excludes one retail and three oil firms with negative equity in a given year.

** Excludes 8 drug, 11 machinery, 14 oil, 3 retail, and 9 textile firms with negative earnings in a given year.

Table 4.7

Means and Scheffe Groupings by Year

	MEANS				SCHEFFE GROUPS (1=70,2=75,3=80,4=85)
	Combined	1970	1975	1980	1985	
Variable	Altman's Bankruptcy Prediction Model Variables					
X1-WC/TA	.305	.314	.329	.312	.263	213,34
X2-RE/TA	.324	.325	.339	.348	.282	3214
X3-EBIT/TA	.109	.119	.122	.119	.075	231,4
X4-Eq/Debt	3.010	4.177	2.003	3.443	2.417	134,342
X5-Sales/TA	1.482	1.451	1.544	1.531	1.403	2314
Z-Score	4.466	5.182	4.017	4.851	3.813	132,324
	Other Variables					
Tass(MM$)	631	246	417	746	1114	43,32,21
Sales(MM$)	944	382	685	1186	1523	43,21
ROI(%)	5.158	5.909	6.188	6.433	2.100	321,4
ROE*(%)	9.235	10.347	11.066	12.518	2.717	321,4
Mkt/Book	1.855	2.355	1.174	2.045	1.846	134,2
P/E Ratio	20.45	28.22	11.35	19.03	24.01	143,432

* Excludes one retail and three oil firms with negative equity in a given year.

** Excludes 8 drug, 11 machinery, 14 oil, 3 retail, and 9 textile firms with negative earnings in a given year.

Industry Effects

Using the pooled data for the four test years, for every variable, except the ROE and P/E ratios, the differences between industries were significant at the .0001 level. ROE was significant at the .01 level, and the P/E ratio was not significant. Figures 4.1 and 4.2 display the results in graphic form. The multivariate Z-scores were significantly different across industries, indicating that there are real differences in overall performance and risk across industries. Drug firms Z-scores were significantly higher than for all other firms. Oil and gas firms had the lowest Z-scores, but not significantly lower than textiles and machinery. These results are consistent with other findings and common knowledge: the drug industry is stable and profitable, while the oil industry is notoriously risky, particularly in recent years.

While the Z-score is an overall measure of financial performance, the five component variables each make a contribution to the overall measure, pointing to some of the financial characteristics and strategies that differ across industries. Some are the result of intrinsic economic differences, and others are the result of historic patterns of competition. Drug firms have significantly higher scores on ratios X3, earnings before interest and taxes over total assets, X4, market value of equity over total liabilities, and

X2, retained earnings over total assets, all indicating the high profit levels in this industry. The textile industry has a high X1 ratio, net working capital over total assets. Other sources, such as the Robert Morris Annual Statement Studies (1985), indicate that the textile industry is characterized by high accounts receivables and inventories, which reflect a type of customer financing that is traditional in this industry. The oil industry is highly capital-intensive, with very low ratios of working capital, X1, and sales, X5, to total assets. As would be expected, the retail industry has a high ratio of sales to total assets, X5.

Of the component variables, X4, the equity/debt ratio, appeared to be the most closely related to the Z-score. This can be seen in the parallels between these two variables in Figures 4.1 and 4.3, and it was confirmed by their high correlation coefficient, .93. This reinforces the common belief that increased leverage increases risk, but as Hurdle (1974) points out, while this is true for financial risk, firms with low business risk and more stable earnings can better manage high debt levels. The observed importance of X4, the equity/debt ratio, parallels the finding reported above that X4 was one of the two variables retained in the stepwise discriminant procedure. However, in that case it was less significant than X2.

Figure 4.1

Z-Scores by Industry

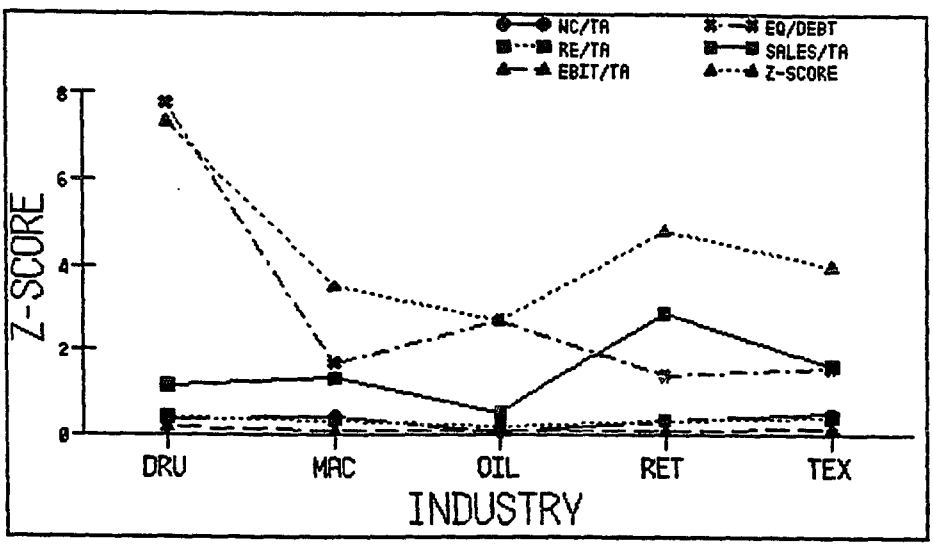


Figure 4.2

Performance Measures by Industry

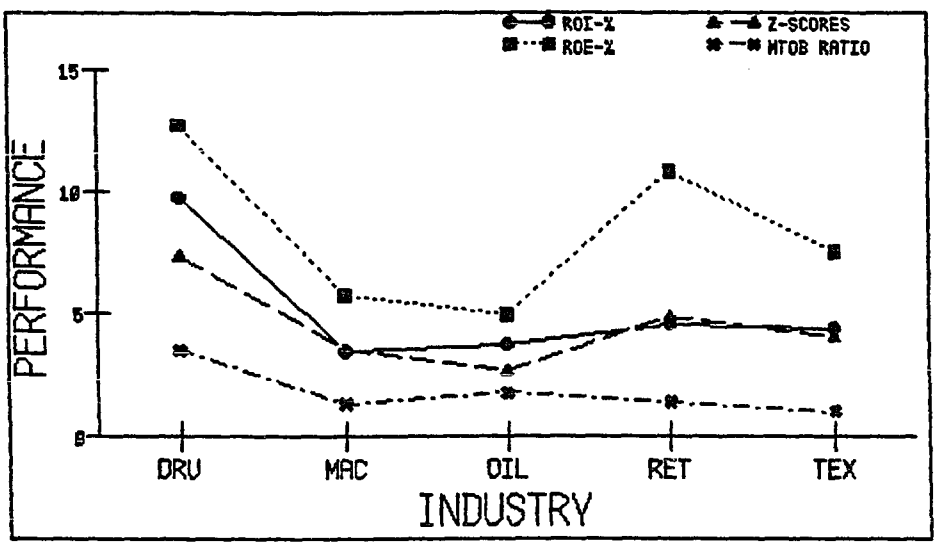


Figure 4.3

Z-Scores by Year

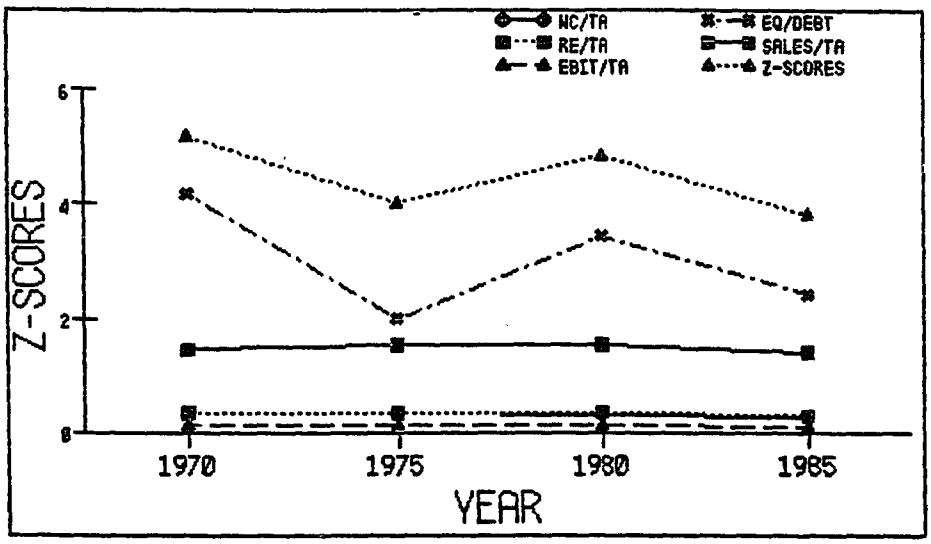
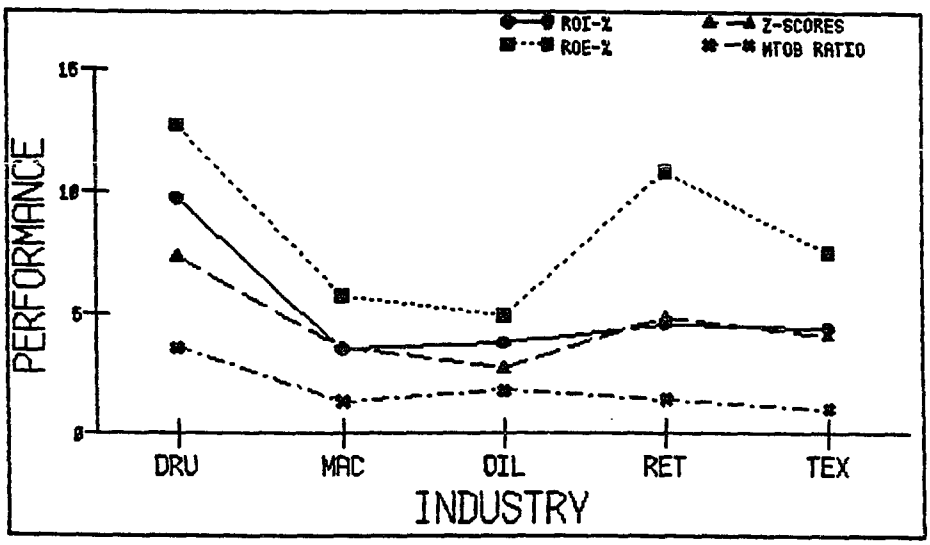


Figure 4.4

Performance Measures by Year



Time Effects

Differences over time are somewhat more complex, since they are the result of interaction of industry effects with more general economic factors. Figures 4.3 and 4.4 display the results in graphic form. Over the fifteen year period studied, there have been some general deliberate changes in financial strategy and practice. The increased dependence on debt shows up in the decreased values for X2, the ratio of retained earnings to total assets, and X4, the market value of equity to total debt ratio. The decrease in X1, net working capital to total assets ratio, is consistent with the increased emphasis on and sophistication of working capital management. Other variables are affected by changes in business cycle factors, such as interest rates. Interest rates directly affect the required return for investors and the cost of capital for companies. Consequently changes in interest rates drive changes in all return measures, such as ROI, ROE, and X3, EBIT.

Z-scores were highest in 1970, fell in 1975, rose in 1980, and reached their lows in 1985. The low Z-scores in 1985 are consistent with the generally low levels of profitability and high bankruptcy rates in that year. Mean ROI, ROE, and X3, EBIT, were all significantly lower in 1985 than any other year. Only a lower X4, equity/debt ratio, in 1975, when stock prices were depressed, kept 1985 from scoring the worst on every variable. The results are consistent with the generally weak

corporate profits in 1985, but accentuated by the industry selection. The oil and gas, machinery, and textile industries were among the weakest in the economy in 1985.

Market Effects

Although there were strong industry effects on performance measured in accounting terms, financial markets reacted to level out these differences. This is consistent with financial theory, particularly that relating to unsystematic risk and market efficiency. Investors buy earnings, and the variations in accounting-based performance measures are elements of unsystematic risk. The drug industry, with its high profitability ratios, commanded significantly higher stock prices, with a market-to-book ratio of 3.61 compared with values from .98 for textiles to 2.14 for oil and gas. For P/E ratios there was no statistical difference between industries. It should be noted that the price-earnings ratio is sensitive to both prices and earnings, and the P/E ratio was negatively correlated with both ROI ($r = -.195$) and ROE ($r = -.263$). The P/E ratio showed a significant time effect and no interaction effect. The market-to-book ratio serves as the intervening variable, with high values for firms with high ROE, and consequently the market-to-book ratio has the same strong industry effect as ROE. The market-to-book ratio is a measure of the market's evaluation of the firm's assets and the P/E ratio of the firm's earnings. Direct interpretation of P/E and

market-to-book ratios is difficult, since all of the accounting-based variables are measures of past performance, while stock prices are based on the expected value of future earnings. This creates special problems in evaluating variables for firms which are declining. High P/E ratios may reflect optimistic evaluations of long-term firm and industry prospects, or they may be high because of temporarily depressed earnings.

Size Effects

Size effects were generally not important. Total assets were used as the covariate in the ANCOVA analysis, and correlations with all the variables were calculated. The covariate was significant only for X2, retained earnings over total assets, and X3, EBIT. In the first case, one would expect large firms to be older and to have accumulated greater retained earnings over time. In the second case, the result may reflect economies of scale. None of the correlation coefficients for asset size and any of the ratio variables reached the .30 level.

Comparative Data

In order to test whether the sample was typical of a larger sample of firms, the ROEs and P/E ratios were compared to the information collected on an annual basis by Business

Week magazine for each of the four years included in this study. The performance values found in this study were not as close to those reported by Business Week as would be desirable, but the same general trends between industries and over time were found. The two samples are different in a number of ways. The firms included in the Business Week sample are larger, and in that report firms are added and dropped on an annual basis. Also the industry classifications are similar, but not identical, particularly in the oil and gas industry. The sample in this study included only firms which were classified as oil and gas producers and did not include those firms which Compustat classified as petroleum refiners. The latter as well as coal companies are included in the natural resources group in Business Week, which was the comparison group.

Another check of the results was made by comparing the Z-scores with the bankruptcy rates as reported in Dun and Bradstreet's Failure Record and Business Week. In general, the industry differences and trends in that data and the Z-scores in this study are consistent. The drug industry has high Z-scores and few bankruptcies. The oil and gas industry has low Z-scores, even in times in which bankruptcies are few, another indication of the risky character of the industry. The time trends in Z-scores and failure rates were consistent in direction, but there was a dramatic increase in bankruptcy rates from 1980 to 1985, about 40 per 10,000 firms to about 300, while the average Z-scores declined to a much smaller

degree, 4.85 to 3.81.

Use of the Altman Z-Score Model

Since the focus of this study was on Z-scores, some observations on its use may be in order. A major advantage in the use of the Z-score model is its multivariate character, including both accounting and market-based variables. That advantage is muted by the very high correlation, .93, with the market value of equity to total debt ratio. A second advantage of using Z-scores is that the five ratios included in the model are easy to calculate from readily available financial data, and each taken separately is an intuitively straight-forward measure of one dimension of financial performance. The difference in Z-scores across industries may be a problem in some studies, raising the issue of the extent to which bias is introduced by the industry composition of research samples. On the other hand, the differences may be a realistic reflection of differences in bankruptcy and other kinds of risk across industries and time. What is remarkable is how much the number of business failures in 1985 has increased given the modest decrease in mean Z-scores. Either the distribution of Z-scores has changed, or firms going bankrupt have higher Z-scores than in earlier years. The latter possibility is consistent with the widely publicized increase in the use of bankruptcy as a deliberate turnaround strategy, whereas longer ago bankruptcy had much more negative implications and was considered a last

resort.

Correlation analysis shows that Z-scores and all the component variables have positive correlations with each other. X1, working capital to total assets, and X5, sales to total assets, the most industry specific variables, have low correlations, less than .3, with Z-scores. The other correlations with Z-scores are X2, retained earnings to total assets, .36, X3, EBIT to total assets, .56, and X4, equity to debt, .93.

In summary, Z-scores would appear to be an attractive measure of financial performance for many studies in strategic management. Z-scores appear to be at least as robust as other measures of financial performance across industries and over time. Like all measures of performance they are not perfect, and their use requires careful attention to sample characteristics and the nature of the expected relationships between the research variables of interest and the performance measures.

Matching Sample Selection Considerations

The relative rarity of bankruptcy compared to nonbankruptcy presents a special set of problems for using statistical procedures in bankruptcy studies. In the typical study, the sample of bankrupt firms includes all known members

of the bankrupt population, and the comparison group of nonbankrupt firms is similar in size but constitutes a relatively small proportion of the population of nonbankrupt firms. The resulting biases and the effects on the accuracy of group classification have been discussed and tested by Zmijewski (1984). He found that the overall accuracy of classifications increased as the size of the nonbankrupt sample approached the size of the population from which it was drawn. However, the error rates for the groups are not proportional to the overall error rate. The error rates for the groups were most nearly equal when the groups were equal in size, and the error rate increased in the smaller group and decreased for the larger as the groups diverged in size. For example, using an unweighted probit model, Zmijewski found an error rate of 2.5% for bankrupt firms, 7.5% for nonbankrupt firms, and 5% overall when the sample sizes were both 40. With the same bankrupt sample of 40, but with a nonbankrupt sample size of 800 (taken as the population), the error rates were 30% for the bankrupt firms, 0.5% for nonbankrupt firms, and 1.9% overall. This is consistent with the frequently reported observation that for classification analyses in general using unequal sample sizes for parameter estimation tends to over-predict membership in the class with the larger sample size in the estimation model, and to under-predict in the class with the smaller sample size, with the overall classification accuracy rising as proportions in the estimation samples approach the proportions in the population (Green, 1978; Morrison, 1976). The worst of the

problem is that the accuracy usually declines in the category of greatest interest, bankrupt firms in this study.

In bankruptcy studies, whether in academic research or in bankruptcy prediction and credit rating for financial institutions, the costs of misclassification for bankrupt firms is higher than the costs of misclassification for nonbankrupt firms, so the decrease in overall error rates is little compensation for the greatly increased error rate for the bankrupt group. In most statistical techniques, comparing groups results are improved by using equal-size groups. Mutchler (1985) studied the effect of unequal group sizes using problem and nonproblem firms based on audit findings, and concluded that for both MDA and logit classifications researchers should use equal-size groups.

Sample selection is also subject to other biases. Zmijewski considered the bias introduced by the higher proportion of bankrupt firms excluded because of missing data. Differences in key factors, such as size, may also introduce biases. In most of the studies using equal-size samples, the nonbankrupt firms have been selected by matching the key variables such as size, data periods, and industry. In the studies using proportional-size samples, no attempts to detect biases introduced by divergent characteristics on important variables have been reported.

In order to better understand some of the issues discussed above, a number of experiments were conducted. Following the tradition in the field, most of the work in this study was done using an equal-size matching sample (n = 73) of firms matched for industry, size, and time period. The procedures used for selecting that sample are described in Chapter V. In addition, the classification procedures were carried out using both large matching samples, which were a reasonable representation of the population of firms of interest, and equal-size matching samples drawn randomly from that population.

The large matching sample was taken from the 1985 Compustat Industrial tape. It included all the firms on the tape with the following exceptions: (a) all financial and other service firms, SIC codes 6000 and up; (b) regulated public utilities, SIC codes 4800 to 4999; (c) all bankrupt firms, including those known to be legally bankrupt, those included in the bankrupt firm sample, and those with negative net worth. The firms with negative net worth were excluded on the basis that they met one of the standard definitions of bankruptcy, even though they had not formally declared bankruptcy. A total of 1276 firms met the criteria and were included in subsequent studies.

The firms in the large sample on average were larger and financially stronger than the firms in the matching sample. The latter conclusion is based on a comparison of the mean

Z-scores, the old Altman model and the two new models developed in this study. The data for the comparison is shown in Table 4.8, with the variable abbreviations those used throughout this study. Other implications of this data are discussed at several other points in this study.

Classification analyses using the large matching sample were run using both the two-variable model and the five-variable model and using MDA, logit, and probit procedures. In the case of MDA, the procedures depend on the designation of the prior probabilities of group membership. In SAS, the default is that the probabilities are equal, but the probabilities can be specified as proportional to the sample sizes. The procedure was run using both options. The results are shown in Table 4.1 on page 69. With one exception, the two-variable model using MDA with equal probabilities, the overall accuracy of the classification was better using the large sample than the equal-size matched sample. However, the increased overall accuracy was gained at the expense of accuracy in correctly classifying the bankrupt firms, which in every case was less accurate than that for the matched sample. In the MDA analyses, using the equal-prior probability option reduced the overall accuracy and increased the accuracy in classifying the bankrupt firms.

Table 4.8

Comparison of Matching Samples

Sample	Predictor Variables					
	X1	X2	X3	X4	X5	TASS ($ in mil.)
73 BR	.02	-.10	-.07	.27	1.75	380
73 NBR	.31	.32	.11	1.60	1.67	354
1276 NBR	.27	.29	.08	2.81	1.42	1529

Z-Scores

Sample	Z1	NZ5V1	NZ2V1
73 BR	1.56	-.31	-.21
73 NBR	3.81	2.29	2.36
1276 NBR	4.11	2.99	3.07

(BR = Bankrupt Firms, NBR = Nonbankrupt Firms, TASS = Total Assets; X1, X2, X3, X4, X5 are the Altman bankruptcy prediction model variables, Z1 = Altman's Z-Score; NZ5V1, NZ2V1 are the new Z-Scores developed in this work)

In order to separate the size effects from the matching effects, ten equal-size samples were selected from the large sample on a purely random basis. These ten samples were then used in classification tests, and the results are shown in Table 4.1 on page 69. Overall classification accuracies were less than than those for the large sample, but the accuracy in classifying bankrupt firms was improved even over the MDA equal-prior probabilities option. Compared to analyses using the matched comparison sample, MDA gave inferior results, and logit and probit gave superior results. The differences were not great, and there was no ready explanation for the differences.

As indicated above, the firms in the large sample from which the random samples were drawn were on average larger and healthier than the original matching sample, and, as it should have been, this was also true for the random samples. Since the mean Z-score differences were larger, better prediction results might have been expected. However, any effect that might have been there was lost in the interactions with other variables.

The results generally support the use of equal-size matched comparison samples. The correct classification of bankrupt firms is maximized, which in most studies is more important than overall accuracy. In practical applications, it is reasonable to assume that the cost of misclassification is greater for bankrupt firms than nonbankrupt, which supports the use of matched samples. The use of the smaller matched samples also reduces computational costs. Knowing the direction of the effects is useful, because it allows more informed decisions about procedure selection.

Comparison of Statistical Classification Procedures

Studies of financial distress, including not only bankruptcy prediction, but a much broader range of concerns, has made extensive use of several statistical classification procedures, primarily MDA (multiple discriminant analysis), logit, and probit analysis. This in turn has generated

discussion and testing of the relative strengths of the procedures and statistical problems in their application. While no attempt will be made here to review the technical aspects of these studies, some of the conclusions are worth noting.

Algorithms for MDA computation were generally available much earlier than those for logit and probit, both of which require iterative procedures. Consequently the pioneering work of Altman (1968) and other studies prior to about 1980 used MDA exclusively. Since that time the increasing availability of commercial statistical packages has allowed researchers access to the advantages of logit and probit. Logit and probit have a theoretical advantage over MDA in that they imply that causality flows from the independent variables to the dependent categorical variable, rather than the reverse in MDA. Logit and probit also have less restrictive assumptions and the calculated parameters are more readily interpretable. Logit and probit have much in common and typically give very similar results. Because probit is based on the more restrictive assumption of normal distributions and is computationally more difficult, it has generally been less used than logit in the social sciences (Haberman, 1978). Both have been used in bankruptcy studies, with probit being the more common choice. Gentry, Newbold, & Whitford (1985a, 1985b,1985c, 1987) used all three methods, but primarily reported the probit results. Zmijewski (1984) also chose probit for his studies, but Lo

(1986) and Mutchler (1985) utilized logit. Lo compared the appropriateness of MDA versus logit for bankruptcy analyses and concluded that the null hypothesis that MDA and logit were equivalent could not be rejected. Gentry, Newbold, & Whitford (1987) reported that classification results were about the same for all three models.

In all the analyses used to test the effects of sample size and selection described above, logit and probit analyses were run in parallel with the MDA, and the combined numerical results are shown in Table 4.1 on page 69. The results provide little basis for choosing one procedure over another. In the analyses using the matched comparison sample, classifications were slightly more accurate using MDA. In analyses using the large sample or random samples drawn from it, logit and probit gave slightly more accurate results, but the differences appear insignificant. There was no pattern at all in differences between logit and probit. As expected, the likelihood ratios fell sharply as the time before bankruptcy increased.

Table 4.9

Logit and Probit Coefficients and Asymtopic T Ratios
(Five Variable Model)

	Probit Coef.	T Ratio	Logit Coef.	T Ratio
		Year 1		
X1	-.45	-.45	-.57	-.32
X2	-2.62	-3.09***	-4.77	-2.65***
X3	-5.50	-2.61***	-8.94	-2.42***
X4	-.75	-2.05**	-1.49	-2.04**
X5	.12	.72	.18	.61
Constant	.83	2.36***	1.58	2.37***
Likelihood Ratio	104.86		105.04	
		Year 2		
X1	.71	.88	1.28	.91
X2	-2.47	-2.91	-4.46	-2.84
X3	-4.40	-2.58	-7.15	-2.39
X4	-.25	-1.73	-.53	-1.64
X5	-.02	-.13	-.03	-.13
Constant	.88	3.08	1.56	3.04
Likelihood Ratio	57.14		58.31	
		Year 3		
X1	-.12	-.17	-.17	-.14
X2	-2.12	-2.88***	-3.61	-2.80***
X3	-3.08	-1.99**	-4.74	-1.85**
X4	-.08	-.60	-.16	-.74
X5	.07	.55	.11	.52
Constant	.74	2.64***	1.26	2.62***
Likelihood Ratio	32.67		32.88	
		Year 4		
X1	-.50	-.69	-.77	-.65
X2	-1.74	-2.59***	-3.01	-2.50***
X3	-2.58	-1.66*	-4.19	-1.64*
X4	-.11	-1.23	-.18	-1.13
X5	.06	.48	.10	.49
Constant	.84	2.91***	1.39	2.88***
Likelihood Ratio	30.31		30.26	
		Year 5		
X1	-.89	-1.22	-1.41	-1.20
X2	-1.28	-1.93**	-2.18	-1.93**
X3	.87	.66	1.55	.69
X4	-.16	-1.40*	-.26	-1.37*
X5	.19	1.38	.31	1.35
Constant	.33	1.10	.54	1.09
Likelihood Ratio	18.62		18.65	

Table 4.9 (cont.)

Logit and Probit Coefficients and Asymtopic T Ratios
(Five Variable Model)

		Year 6		
X1	-.67	-.98	-1.04	-.95
X2	-1.42	-2.20**	-2.39	-2.15**
X3	.46	.41	.80	.43
X4	-.03	-.33	-.04	-.31
X5	.13	.93	.21	.89
Constant	.31	1.05	.51	1.04
Likelihood Ratio	12.53		12.58	

t tests: * pr < .1, ** pr < .05, *** pr < .001

Logit and Probit Coefficients and Asymtopic T Ratios
(Two Variable Model)

	Probit Coef.	T Ratio	Logit Coef.	T Ratio
		Year 1		
X2	-3.13	-4.45***	-6.00	-3.91***
X4	-1.27	-3.79***	-2.19	-3.29***
Constant	1.11	5.24***	2.06	4.89***
Likelihood Ratio	96.41		97.90	
		Year 2		
X2	-2.66	-3.58	-4.67	-3.48
X4	-.39	-2.35	-.79	-2.41
Constant	.90	4.76		
Likelihood Ratio	50.34		52.12	
		Year 3		
X2	-2.33	-3.50***	-4.04	-3.38***
X4	-.20	-1.84**	-.37	-1.84**
Constant	.75	3.97***	1.32	3.83***
Likelihood Ratio	28.22		29.04	
		Year 4		
X2	-2.09	-3.46***	-3.59	-3.23***
X4	-.19	-2.06**	-.31	-1.92**
Constant	.71	3.79***	1.23	3.63***
Likelihood Ratio	26.27		26.51	
		Year 5		
X2	-1.48	-2.52**	-2.47	-2.47**
X4	-.14	-1.49*	-.23	-1.44*
Constant	.53	2.99**	.88	2.92***
Likelihood Ratio	15.49		15.55	
		Year 6		
X2	-1.55	-2.77***	-2.59	-2.67***
X4	-.03	-.38	-.04	-.37
Constant	.43	2.41***	.71	2.38***
Likelihood Ratio	10.77		10.87	

t tests: * pr < .1, ** pr < .05, *** pr < .001

The logit and probit coefficients are useful in estimating the relative weights of the variables, as are the standardized discriminant analysis coefficients. The logit and probit coefficients for the two- and five-variable models are shown in Table 4.9. As would be expected, the relative weightings roughly parallel, but do not exactly match, those found using multiple discriminant analysis. As in the case of MDA, the use of a two-variable model is supported.

Conclusions about Alternative Techniques

The statistical theory and empirical evidence available suggests the following conclusions about the use of classification models in bankruptcy prediction studies and applications:

1. Logit and probit are less subject to adverse effects arising from deviations from normality and unequal covariance matrices for the estimation subsamples.
2. Interpretation of the coefficients in the classification models is more reliable for probit and logit models than for MDA, but calculating standardized coefficients for MDA analyses overcomes most of this disadvantage.
3. MDA models are intuitively simpler, use less computer resources, and are more easily reduced to simple classification models which can be applied without statistical computer software packages.
4. There is no clear evidence that any one of the three

models provides more accurate classifications than any other.

The conclusions do not provide a basis for designating any one best method. As in most decisions about research methods, the researcher must select among competing methods on the basis of research objectives and data characteristics. The evidence available would appear to provide little basis for criticizing or rejecting research studies and findings on methodological grounds. In the substantive portions of this dissertation, MDA was the only classification procedure used.

Chapter Summary

The Altman bankruptcy model has been tested and a new set of parameters developed. A revised model using only two of the Altman variables, the ratio of retained earnings to total assets and the ratio of market value of equity to the book value of total liabilities, proved to be equally as good in classifying failing and nonfailing firms as the original model in the year immediately prior to bankruptcy. The revised model was slightly more effective in distinguishing between failing and nonfailing firms five years before bankruptcy, but all models tested exhibited declining predictive power as the time before bankruptcy increased. The decline in predictive power appeared to be more a matter of decline patterns than model efficiency.

The Altman model was first published in 1968, so a test of the stability of the model over time and across industries was

conducted using a sample of one hundred firms, twenty in each of five industries, and using data for 1970, 1975, 1980, and 1985. Significant differences in Altman Z-scores across industries were observed, and to a lesser extent over time. However, in all cases the Z-scores and the component variable scores were closely correlated with more traditional financial performance measures. It was concluded that the Altman model is an appropriate tool for strategic management research.

Extensive comparisons of multiple discriminant analysis with logit and probit statistical techniques found little or no difference in their predictive power. The relative importance of the variables in the model were found to be the same, no matter which statistical technique was used. However, sample size and prior probability assumptions were found to be important considerations. Using large matching samples of nonfailing firms, in order to more accurately reflect actual population distributions, resulted in better overall classification of failing and nonfailing firms. However, that improved overall classificatory power was at the expense of accuracy in identifying failing firms, the category of primary interest. Maximum predictive power was obtained by using equal-size matching samples and equal priors.

Chapter 5

RESEARCH SAMPLES AND DATA COLLECTION

Chapter Introduction

The primary purpose of this chapter is to provide information on the research sample and data used in the several study segments reported in subsequent chapters. The processes by which the research sample of bankrupt firms and the matching sample of nonbankrupt firms were selected and the required data collected are described, and the decision rules for the classification of firms for the degree of diversification, industry, and decline type are explained.

Sample Selection

The selection of the bankrupt firms sample and the collection of the relevant data were time-consuming tasks. The collection of data on an adequately sized sample of bankrupt firms has presented problems to previous investigators, and the present study had requirements beyond those in most prior work. In prior studies the bankrupt firms were taken as a homogeneous group, and there were no research design elements that required partitioning the samples. The primary thrust of this study was to learn something about the relationships between such strategic factors as size, industry, and age and the financial

variables previously studied. These questions, as well as questions about bankruptcy process outcomes, required partitioning the sample, and therefore called for larger samples than otherwise would have been required. In addition, the question about outcomes generated the need for postbankruptcy as well as prebankruptcy data.

The two primary requirements for the sample were that the firms were on the Compustat files with complete annual report data for six years prior to filing for bankruptcy, and that the firm had entered formal bankruptcy proceedings, either voluntarily or involuntarily, after January 1, 1980. The cutoff date was selected on the basis that the provisions of the The Bankruptcy Reform Act of 1978 became effective on October 1, 1979. Firms with Compustat codes greater than 5999 were excluded from the study. The excluded firms were primarily banks, insurance companies, other financial services firms, and professional services firms.

Compustat is an excellent data source, but its use requires more careful attention than it frequently receives. As with any data base that collects information from sources over which it has little or no control and converts that data to a standard format with uniform definitions, Compustat output can contain distortions which are troublesome. Compustat is not a single file, but rather consists of a series of files, each produced on an annual basis. The files used for this

study included the Annual Industrial Data, Annual Over-the-Counter Data, Annual Industrial Research Data, and Annual Over-the-Counter Research Data. The original intent was to use only the Research files and to depend on the codings on those files for identification of bankrupt firms. The Research files are made up of firms which have been deleted from prior year files. The Research files have footnotes which indicate the reason for deletion of the firms from the regular files. However, the same footnote is used to identify bankrupt firms and liquidated firms. Some bankrupt firms are reorganized and not liquidated, and some of the liquidations reported on the Research tapes were voluntary, and in a few cases they were very profitable. Unfortunately some of the latter group have appeared in bankrupt firm samples in other studies. While at one time it was customary for the major stock exchanges to drop firms when they filed for bankruptcy, more recently the stocks of some large firms with ongoing businesses have continued to be listed on major stock exchanges without interruption. Also, some firms which had been in bankruptcy and delisted have been relisted after successful reorganizations. In general, Compustat has followed the lead of the stock exchanges in dropping and adding firms to the active Annual files, but not without exception. Also, some firms have been dropped from the active files without being added to the Research files.

Given the problems listed above, the search for bankrupt firms was broadened by searching periodical indexes and lists

in books and articles on bankruptcy and financial distress, including works by Altman (1983); Gentry, Newbold, & Whitford (1985a); Platt (1985); and Grace (1984). Ultimately a master list of about 500 firms bankrupt since 1970 was developed. The firms on that list that entered bankruptcy after January 1, 1980 and which had relatively complete data on any Compustat tape were taken as the research sample, a total of 73 firms. The bankrupt firms and the matching firms, whose selection is described below, are listed in Table 5.1. In a limited number of cases missing data on Compustat was collected from other sources, such as the business press, annual reports, SEC 10-ks, bankruptcy disclosure statements, Moody's Manuals, and Standard and Poor's Corporate Records. This data were entered manually, rather than reducing the sample size by discarding the cases with missing data. In no case was complete annual data for more than two years collected from sources other than Compustat. In five or six cases data were collected for two years, and for about an equal number one year only. In addition, a few individual missing data items, most frequently stock prices, were collected manually. In every case, data from the second source that duplicated Compustat data were checked for consistency before using that source. Nonfinancial data and narrative information on the bankrupt firms, including founding and bankruptcy event dates, were collected from the same sources as the missing data.

Table 5.1

Firms in the Study

BANKRUPT FIRMS	MATCHING FIRMS
AM International	Compugraphic Corp.
Advent	Cetec Corp.
Altec	Wells-Gardner Electronics
Amfesco Industries	Pauley Petroleum Inc.
Anglo	Tri-State Motor Transit
Argo Petroleum	Galaxy Oil Co.
Auto Train Corp	Florida East Coast Inds.
Barclays Ind. Inc	SMD Industries Inc.
Beker Industries	First Mississippi Corp.
Berry	Trico Industries
Berven	Masland C. H. & Sons
Bobbie Brooks	Noel Industries
Branch Industries	Mayflower Group Inc.
Braniff Intl. Airways	Aloha Inc.
CS Group	Raven Industries Inc.
Capitol Air	Republic Airlines Inc.
Charter	National Intergroup Inc.
Commodore	National Homes Corp.
Continental Airlines	Western Airlines Inc.
Continental Steel	Athlone Inds.
Cook United	Lowe's Inc
Cooper Jarrett	Purolator Courier Corp.
Crompton	Crown Crafts Inc.
Data Access	Anderson Jacobson Inc.
Eastmet	Foote Mineral Co.
Flame Industries Inc.	Camco Inc.
Garland Corp.	Movie Star Inc.
Gilman Services	Moore Medical Corp
Global Marine	Unit Drilling & Exploration
Glover	Cagle's Inc.
Good, L. S. Co.	Crowley Milner & Co.
KDT Industries	Heck's Inc.
K-tel International Inc.	Electrosound Group Inc.
LTV	Bethlehem Steel
Leisure Dynamics	Hasbro Inc
Lionel Corp.	General Host Corp.
Lynnwear Corp.	Hampton Industries
MGF Oil	Blocker Energy Corp.
Magic Marker	Hunt Mfg.
Manville Corp.	Owens-Corning Fiberglass Corp.
Marion	Pauley Petroleum Inc.
Mclouth	Cyclops Corp.
Mego International Inc	Wood Stream Corp.
Mesta Machine Co.	Monarch Machine Tool Co.
Mobile Homes Ind.	Vintage Enterprises Inc.
Morton	Spencer Cos. Inc.
National	Morse Shoe Co.

Table 5.1 (cont.)

Firms in the Study

BANKRUPT FIRMS	MATCHING FIRMS
Nucorp	Big Three Industries
Pathcom	Electrosound Group Inc.
Phoenix Steel	Bundy Corp
Poloron Products	Champion Homebuilders Co.
Revere	Handy & Harman
Richton International	Lazare Kaplan Intl.
Robins, A.H.	Bausch & Lomb Inc.
Robintech Inc.	Pantasote Inc.
Rusco	Intl Aluminum
Salant Corp.	Garan Inc
Sambo's Restaurants	Church's Fried Chicken Inc.
Saxon Industries	Lydall Inc.
Smith International	Cameron Iron Works
Solomon	Frigitronics
Steelmet	Ogden Corp.
Stevcoknit Inc.	Adams-Millis Corp.
Storage Technology Corp.	Dataram Corp.
Tacoma Boat	American Ship Building Co.
Tobin Packing Co.	Seaboard Corp.
Towle Mfg.	Oneida Ltd.
Transcontinental Energy	Zapata Corp.
UNR	Keystone Cons. Inds. Inc
Upson Co.	Federal Paper Board Co.
Wheeling-Pittsburgh Steel	NVF Corp.
White Motor	Paccar Inc.
Wickes Cos.	National Intergroup Inc.

Setting the data-cutoff period presented several problems, but the decision rule followed was to use the data for the last full fiscal year prior to bankruptcy, if available. Irregular fiscal years added to the problems. The months that the fiscal years ended for firms in the sample included nearly every month in the year. Compustat includes firms with fiscal months ending from June to December of the nominal year, and January through May of the following year on its annual tapes, and has a data item for the month in which fiscal year ends. Some troubled firms fail to make timely reports as they approach

bankruptcy, and in other cases the necessary data could not be located for the final year before bankruptcy. Firms with more than two years of missing data were dropped from the sample. As a result, the period between the last annual report and the date the firm filed for bankruptcy varied from 0.44 to 24.69 months with a mean of 9.38 months.

Some prior studies did not use the most recent annual data prior to bankruptcy, unless bankruptcy was declared prior to the receipt of the annual report by Compustat. This is a research convenience when using the Compustat Research files, as it matches the Compustat file convention. It is further justified by the assurance that the information in the report was publicly available prior to the bankruptcy date. However, with quarterly SEC reporting and the usual release of financial information prior to the publication of the annual report, the disadvantages of pushing the "last year" back a full year were deemed to outweigh the disadvantages of the shortness of time between the fiscal year end and the bankruptcy declaration. Given the range of options, the time period chosen for a study is arbitrary at best, and given the limited number of bankrupt firms, any reasonable decision rule that preserves the maximum number of cases is to be preferred.

Following the procedures described above, a sample of 73 firms was selected. The bankruptcy dates ranged from March 3, 1980, to August 26, 1986. Some key data on these firms are

presented in Table 6.1 on page 134, which compares the bankrupt firms with their matching counterparts. In reviewing the data on the bankrupt firms, it is important to note that many of the firms were relatively small and unknown. Although all were listed on the major stock exchanges or on nationally published over-the-counter lists, and most were described in either Standard and Poor's Corporate Records or Moody's Industrial manuals, detailed information in many cases was not available, particularly for the period immediately before bankruptcy. Firms in financial difficulty are frequently delisted by exchanges, and delisted firms are generally dropped in Standard and Poor's and Moody's publications. Except for the few firms given detailed qualitative attention in the mini-cases in the appendix, there was little value in collecting more information on any firm than that which was also available on the least well-known firms.

Classification of Bankrupt Firms

The firms in the sample were classified on the basis of diversification, industry, and reorganization outcome, as described below.

Diversification Classification

The effect of diversification on performance has been one of the dominant themes in strategic management research since

the pioneering work of Wrigley (1970) and Rumelt (1974). Also, all the business portfolio models either explicitly or implicitly include the reduced risk of bankruptcy as a benefit of diversification.

The classification of firms for this study was done using the Wrigley-Rumelt (Rumelt, 1974) four primary categories. To the extent that quantitative data were available, Rumelt's classification scheme was followed. Rumelt's subcategories for vertical integration and for constrained and linked diversification were not used, largely because the sample was dominated by relatively small single businesses and further fragmentation of the other already small classifications seemed inappropriate. The diversification definitions and decision rules which were used were:

Business Relationships:

1. A discrete business is one that is strategically independent of the firm's other businesses.
2. Businesses are related to one another when a common skill, resource, market or purpose applies to each.

Diversification Classifications

1. Single Business: 95% or more of a firm's revenue comes from one discrete business.
2. Dominant Business: 70 to 95% of a firm's revenue comes from one discrete business.
3. Related Diversification: less than 70% of a firm's

revenue comes from any one discrete business, but more than 70% comes from related businesses.

4. Unrelated Diversification: Less than 70% of a firm's revenue comes from related businesses.

Classification Decision Rules

The paucity of data on many of the smaller firms prevented a strict quantitative application of the Rumelt definitions in classifying the firms. In those cases for which quantitative data were not available, the following decision rules were used. The decision rules were largely based on SIC codes as reported by Standard and Poor's. The rules were applied in the order given below when making the classifications.

1. Firms with a single SIC code were classified as single businesses.
2. Firms with more than one SIC code were classified as a single business, if the codes were for very closely related products, e.g., 2331, women's blouses and shirts; and 2335, women's dresses.
3. Firms with more than one SIC code were classified as a single business, if the second code clearly indicated vertical integration, e.g., 2011, meat packing; and 5147, meat wholesaling.
4. Firms with only two SIC codes less closely related than specified in the previous rules were classified as dominant businesses.

5. Firms with three or more SIC codes were classified as related diversifiers or unrelated diversifiers, based on an evaluation of the SIC codes and available descriptive information. In most instances, firms with multiple businesses were large, and at least some quantitative segment data were available.

The distribution of firms by level of diversification is shown in Table 5.2.

Table 5.2

Firms by Diversification Classification

Single Businesses	50
Dominant Businesses	10
Related Diversifiers	10
Unrelated Diversifiers	3
Total	73

The unrelated diversifiers were Charter Co., LTV Corp., and UNR Industries.

Industry Classification

All firms were assigned a single four-digit SIC industry code. Of the 73 firms in the sample, 60 were either single businesses or dominant businesses for which the industry classification was relatively straightforward. For the diversified firms, the classification was determined by the firm's largest business segment and the segment most directly responsible for the firm's bankruptcy. Only one case was

encountered for which the largest segment and the failing line of business were not the same. In the case of the Charter Co., the failing business was petroleum refining, which was smaller than petroleum marketing or its unrelated businesses. Only the parent company and the refining subsidiary filed for bankruptcy. Other subsidiaries, including life insurance and petroleum marketing, did not file for bankruptcy. The firm was classified as a petroleum refiner for analytical purposes.

Sources of information used for the industry classification were:

1. Compustat Industry Codes: All the Compustat industry codes are four digit, but those with a terminal zero are generally equivalent to three-digit, and in some cases two-digit, SIC codes. Compustat industry codes generally parallel the SIC codes, but there are differences. For example, the SIC has a single code, 3573, for all electronic computing equipment, but Compustat has ten separate codes, 3680 to 3689, an unused SIC range, for computing equipment.
2. Standard and Poor's Corporate Register: The Register lists SIC codes at the four-digit level. Multiple codes are listed for firms participating in more than one four digit-industry. Codes are generally listed in order of segmsnt size.
3. Descriptive information from annual reports, Moody's, Standard and Poor's Corporate Records, and the business press.

The decision rules used for the industry classification in the order in which they were applied were:

1. If S & P listed a single SIC code, and it was the same as Compustat, that code was used.
2. If there was a single S & P code, and the Compustat code had the same first three digits with a 0 fourth digit, the S & P code was used. The assumption was that the firm participated in a single industry segment.
3. If there were multiple S & P codes, and the Compustat code had the same first three digits with a 0 fourth digit, the Compustat code was used. The assumption was that the firm participated in multiple industry segments, and that aggregated generic industry data better represented the firm's competitive environment than any single industry code.
4. If S & P codes were not consistent with Compustat codes, firm descriptions from available sources were used as a basis for classification.

The results of the industry classifications by firm are given in Table 7.2 in Chapter 7. As described in greater detail in Chapter 7, for certain analytical purposes the firms were aggregated into seven industry groups: petroleum, textiles and clothing, process, metals and mining, manufacturing, transportation, and distribution.

Growth and Decline Rates

Inflation-adjusted growth data were collected both by firm and by industry. The specifications and data collection method for each is described below. The rate of decline for each firm was calculated from income data as described below.

Industry Growth Rates

The growth rates used in the study are the inflation-adjusted annualized rate of growth (or decline) in sales for the five full calendar years prior to the bankruptcy declaration. The data used for calculating industry growth rates were taken from the Predicast Base Books, which are compendiums of industry data from a variety of sources. Data from the U. S. Bureau of the Census were used as a first preference. Predicast's data are provided by SIC code with aggregations from two- to seven-digit levels. To the extent possible, the industry growth rate assigned to each firm used industry data at the same level of aggregation used in the industry classification coding described above. The industry growth data left much to be desired in uniformity and completeness. In a few cases, the 1985 data required for the calculation had not been reported, so the available data was annualized over a four-year period. A variety of growth measures are reported for most industries, including input and output data, and dollar and physical unit denominated measures,

including both raw data and index values. Current dollar denominated values of shipments, sales, or revenues were used as the measure of first choice, and they were available in most cases. For industries with wide swings in prices during the research period, such as the petroleum industry, the growth rates in physical units and dollars were often divergent, but the advantages of using dollar data consistently over the range of industries in the sample appeared to outweigh considerations pertaining to a single industry.

An industry growth rate was calculated for each firm using the industry data for the five years prior to the year in which the firm declared bankruptcy. An inflation adjustment was made by dividing the industry data, typically total shipments in dollars, for the year preceding the bankruptcy by a five-year GNP deflator. The deflators for the periods involved were calculated from the annual GNP deflators as reported in the Economic Report of the President (1987). The actual values are shown in Table 5.3. The growth rate was the compound growth rate for the five-year period using only the beginning and ending data. The five-year overall growth rate was used on the basis that bankruptcy is more likely to occur as a result of long-term trends than year-to-year fluctuations. The use of the five-year growth rate can be misleading, if either the initial or final base years were not representative of the period for which the growth was being calculated.

Table 5.3

Factors used for Deflating Firm and Industry Growth Rates

Base Year	Last Year	Deflator Factor
1973	1978	1.459
1974	1979	1.456
1975	1980	1.445
1976	1981	1.490
1977	1982	1.486
1978	1983	1.438
1979	1984	1.375
1980	1985	1.303
	Mean Deflator	1.432

For example, one base year might have represented either a high or low year for a business cycle. As a result, in some cases industries which were classified as declining in one five-year period were classified as growing in a later period. The industry growth rates, at best, are only rough indicators of the health of a given industry, and given the number of different industries represented in the sample, any attempt to tailor the growth rate calculation to specific industries would have been onerous, and any advantages gained would have been lost in the aggregation necessary for the statistical analysis.

The problem of assigning growth rates was compounded by the requirement that every industry period had to be classified as either declining or growing, which meant that very small differences from year to year would change the classification, if the growth rates were near zero. Industry growth rates ranged from +22.45 to -15.92%, with a mean of 1.32% and a

standard deviation of 6.77%. The mean value was somewhat lower than national GNP growth rates, but that was expected since firms in declining industries were overrepresented in the sample.

Firm Growth Rates

Firm growth rates calculated were the five-year annualized inflation-adjusted rates for the five years prior to bankruptcy. The firm data were much cleaner than the industry data, because the sample had been limited to firms for which complete data were available. The rates were calculated on total firm sales, since business segment data were not available for most of the firms. As a result, it is possible that a firm could have had decreasing sales in a failing segment of its business, and yet be reported as having increasing sales as a result of high growth in other business segments. This was most troublesome for diversified firms in which the failure was largely the result of a decline in one industry segment. A prime example is LTV Corporation, whose bankruptcy was steel industry driven, while LTV had a large profitable defense business. Firm growth rates ranged from +90.68 to -31.30%, with a mean of 0.25% and a standard deviation of 15.41%, a much wider range and greater variance than the industry growth rates.

Firm Decline Rates

A declining firm was defined as a firm with negative net income. Quantifying the rate of decline presented a number of problems. If the absolute value of net income was used, the results were biased by different rates of firm growth. If net income was measured as a rate of return, the relatively small numbers exhibited a high variance. Using changes in net income over a five-year period led to additional problems. For example, a firm that grew at a modest rate for four years and had a major loss in the final year before bankruptcy might show an overall growth in net income and yet be bankrupt. The measure that was finally adopted was based on the number of years within the five-year study period for which a firm had a negative net income. The rate was calculated using Equation 1:

Eq. 1 $RD = 1/(YNNI + 1)$

where RD = rate of decline

YNNI = years with negative net income

The equation was based on the assumption that a firm that goes bankrupt after only one year with a negative income has declined more rapidly than a firm that had two or more years in which it was unprofitable. The reciprocal was used for numerical consistency: RD increases as the rate of decline increases. Adding one to YNNI was introduced to avoid a zero denominator for five firms which had no years with negative net

income. Table 5.4 below shows the number of firms with the number of losing years for the sample of 73 firms.

Table 5.4

Number of Losing Years

Number of Losing Years	Number of Firms
0	5
1	17
2	18
3	19
4	8
5	5
6	1
	73

Descriptive Information

General information on the bankrupt firms was collected from a variety of sources, including the Wall Street Journal, Standard and Poor's Corporation Records, Standard and Poor's Corporate Directory, and Moody's Manuals. Letters were written to all the firms for which current addresses were available, requesting copies of annual reports, reorganization plans, and disclosure statements. Most of the requests were directed to chief financial officers, and some to corporate relations or public information officers. The financial officers who did respond generally provided more detailed information, but the corporate relations officers were more likely to respond. Late in the study a limited number of firms were contacted by telephone for information on progress toward reorganization. Of the 73 bankrupt firms, addresses for 55 were found, and

responses were obtained from 25.

Founding dates for all firms were recorded. Choosing a founding date was not always a simple matter. In some cases the firms had existed prior to formal incorporation for unknown periods of time. Many of the firms had undergone name changes and been involved in mergers and acquisitions. The founding date of the parent corporation was used when the record was clear. For example, the founding date for LTV Corporation was taken as 1956, the founding date of the conglomerate, although the steel business responsible for its bankruptcy had largely been acquired from much older firms, such as Republic Steel.

Bankruptcy dates, including both filing and reorganization dates, were largely taken from the Wall Street Journal. In some cases the precise filing date was not known, only the date of the public announcement, but the differences were minor in all cases in which both dates were known. Reorganization dates presented more of a problem. As indicated previously, 12 of the 73 firms had not completed the process by the end of the data collection period. For firms that were reorganized, one of three different events is reported as the end of the process: the date of the filing of the reorganization plan, the Bankruptcy Court confirmation of the plan, or the completion of the execution of the plan. The date of the Court confirmation was used when it was available. For several uncontested plans by small firms, for which no further

information was available, the filing date for the reorganization plan was used. In some cases the information source noted only that the firm had emerged from bankruptcy on a certain date without specifying whether that date was a filing, a court order, or an execution date. For uncontested filings the length of time between filing and the court order was short, typically ten days. For contested filings the confirmation dates were generally available.

Classification of Reorganization Outcomes

The classification of reorganizations as successful or not depended on information on the size of the reorganized firm relative to its size prior to bankruptcy. For firms which survived as publicly traded firms this information was readily available. For other firms it frequently was not, so estimates were made when necessary. In some cases data from the pro forma financial projections in the reorganization plans were used. In other cases newspaper sources estimated the size of the reorganized firm in reporting the reorganization. In some cases qualitative information was sufficient to classify the reorganization as unsuccessful. More detail on this classification is provided in a later chapter which discusses reorganization in detail.

Comparison Nonbankrupt Firms

After the sample of bankrupt firms had been established an equal-sized matching sample of nonbankrupt firms was selected for comparison purposes. The matching firms are listed in Table 5.1 above. The matching firms were selected in the following way. First, all the firms on the 1985 Annual Industrial Compustat tape were listed by industry and company number with data on total assets for each year from 1973 to 1985. Then each firm in the bankrupt sample was matched to nonbankrupt firm from the same industry. The matching firm had complete data for the same six years as that recorded for the bankrupt firm, and most closely matched the bankrupt firm for size of total assets for the last of the six years. Firms which were known to have been bankrupt or had negative equity in the final comparison year were excluded. Statistical tests for differences in sample means indicated that there were no significant differences in sales or total assets in any of the six years for which data was collected.

As discussed in Chapter 4 and detailed in Table 4.1 on page 71, the matching firms were smaller and financially weaker than the population from which they were drawn. Bankruptcy risk is higher in some industries than others, and small firms are at greater risk than large firms, the two factors used in selecting the matching firms. This uniform bias is valuable in making strategic comparisons between bankrupt and nonbankrupt

firms, but it limits the extent to which the findings are generalizable and the extent to which bankruptcy prediction models based on these samples are applicable to other firms.

Chapter Summary

A research sample of 73 bankrupt firms was selected from the Compustat database. Of the 73 firms, 50 were classified as single businesses, 10 as dominant businesses, 10 as related diversifiers, and 3 as unrelated diversifiers using a modified Rumelt classification system. Each firm was assigned to an industry using the Compustat and SIC codes. The industries and industry groupings are reported in Chapter VII. Industry and firm growth rates for each firm for the five years prior to bankruptcy were calculated using inflation-corrected data. A sample of nonbankrupt firms matched for industry, size, and time period was selected for comparison purposes. A complete list of matched pairs of the bankrupt firms and nonbankrupt firms is provided.

Chapter 6

DECLINE AND FAILURE

Chapter Introduction

This chapter begins by providing comparative data on the bankrupt and nonbankrupt firms, which is then used to develop hypotheses about failing firms. Variables which are considered in seeking explanations of decline and failure include rates of profit decline, firm and industry growth rates, standard financial ratios, firm diversification, age, and specific firm and industry shock events. The results of the hypothesis testing are reported with some proposed explanations.

Prebankruptcy Characteristics of the Failing Firms

The primary question addressed here is: how are failing firms different from the general population of business firms and from a specific matched sample of firms? The selection of the sample of bankrupt firms and the matching sample was described in Chapter 5.

The bankrupt firms and the the matched sample were compared on a number of financial characteristics, including Z-scores. Table 6.1 gives the sample means for some of the key

variables and the results of significance testing for the difference in means between the samples. From Table 6.1 it can be seen that there were no differences between the samples on the size of asset or sales, either at the beginning or end of the study period. However, even at the beginning of the period, the bankrupt firms were weaker on some of the performance measures. The most important difference was in X2, the ratio of retained earnings to total assets. As will be developed in more detail in Chapter 7 in the discussion of failure patterns, retained earnings is an indicator both of past performance and the ability to absorb financial shocks. The new Z-scores are heavily weighted for this variable, which explains the differences on the Z-scores at the beginning of the period. Altman's Z-score is not so heavily weighted on this variable, so it does not pick up the differences so quickly.

In spite of the indicated weakness of the bankrupt firms, they grew more rapidly than the matching firms. On average the the bankrupt firms grew by 94.71% in total assets and 105.85% in sales compared to 78.21% in total assets and 84.33% in sales for the matching sample. Also, the firms in the bankrupt sample were more highly leveraged than the comparison firms. The ratios of the market value of equity to total liabilities were 1.02 for the bankrupt and 1.39 for the nonbankrupt firms. The difference was not statistically different (t-test $p < .14$), but it was in the expected direction.

Table 6.1

Comparative Data for Bankrupt Firms and a Matched Sample
(means with standard deviations in parentheses)

Variable	Bankrupt Firms ($ in millions)	Nonbankrupt Firms	Difference T-Test signif.
	Year 6		
Total Assets($)	224.28 (515.45)	260.94 (716.03)	
Sales($)	350.38 (981.89)	348.49 (906.68)	
Margin(%)	10.22 (10.22)	12.04 (10.69)	
ROI(%)	3.68 (7.87)	4.80 (8.80)	
Equity/Debt	.91 (1.12)	1.32 (.94)	*
X1	.24 (.20)	.31 (.17)	*
X2	.19 (.25)	.31 (.19)	**
X3	.10 (.12)	.11 (.11)	
X4	1.02 (1.61)	1.39 (1.45)	
X5	1.73 (0.86)	1.66 (0.78)	
Altman Z	3.21 (1.65)	3.66 (1.36)	
New Z(2V)	1.44 (1.66)	2.15 (1.47)	**
New Z(5V)	1.39 (1.61)	2.10 (1.44)	**
	Year 1		
Total Assets($)	380.01 (845.34)	353.98 (691.53)	
Sales($)	522.19 (1232.11)	443.81 (794.65)	
Margin(%)	0.76 (14.97)	11.27 (9.47)	***
ROI(%)	-16.52 (26.08)	4.80 (8.14)	***
X1	.02 (.35)	.31 (.19)	***
X2	-.10 (.38)	.32 (.21)	***
X3	-.07 (.23)	.11 (.09)	***
X4	.27 (.32)	1.60 (1.64)	***
X5	1.75 (1.03)	1.67 (0.86)	
Altman Z	1.61 (1.76)	3.81 (1.78)	***
New Z(2V)	-.21 (1.47)	2.36 (1.73)	***
New Z(5V)	-.31 (1.51)	2.29 (1.70)	***

* pr < .05, ** pr < .01, *** pr < .001

When the book value of equity was substituted for the market value, the t-test significance moved to p < .02. The sample means for the various Z-scores, which are composite indicators, all were lower for the bankrupt firms than the nonbankrupt firms at the beginning of the study, but they were well above the bankruptcy prediction cutoffs for all the models studied.

Hypotheses and Propositions About the Failing Firms

As a guide for this part of the analysis a set of hypotheses was developed before the data were analyzed. When it was discovered that some of the data for statistical testing were not available, several hypotheses were restructured as propositions. The propositions served as a guide for drawing qualitative conclusions based on either case data or general business and economic data. The hypotheses and propositions are listed below, each with a summary of the considerations and arguments on which they were proposed.

H1. For all failing firms the the rate of decline of net income for the firm will be positively correlated with the rate of sales growth of the industry during the five years prior to the failure.

Failures following slow declines will be the result of failure to act in response to long-term signals. At first the signals may be missed or ignored as temporary (Ansoff, 1984). Even when the signals are understood, a declining firm in a declining industry may find no easy way to reverse the decline. Industries tend to decline slowly, and few totally disappear, so firms that do not find value-preserving exit strategies continue in business. Barriers to exit (Harrigan, 1982; Porter, 1976) will probably be high. Existing market shares

will be strongly defended by other firms. Increases in volume can come only by sacrificing profit margins, and hence will not reverse the decline in net profits. It would be expected that failing firms in this category would be largely found in capital-intensive industries with specialized fixed assets which would be difficult to sell. Interested parties may have little incentive to force action (Hambrick, 1985). The disposal value of fixed assets is low, so lenders secured by mortgages on those assets will be reluctant to trade even poor repayment prospects for certain claims on unwanted collateral. Suppliers will have few alternate customers. Labor may be willing to cut wages to prolong survival. The typical behavior will be strategic drift with a business-as-usual character. The general psychological atmosphere will be one of hanging on and hoping that things will get better.

It is to be expected that managers in declining industries will tend to be risk-averse. They will not be inclined to escalate their commitments (Staw, 1981), but rather will minimize risky investments. In terms of the "gamblers ruin" (Wilcox, 1976), they will make small bets which will increase the amount of time required to bring the firm to its terminal failure event.

On the other hand, firms in growing industries are expected to fail rapidly. Many failures following rapid declines come in the shake-out phase of the industry life cycle (Willard & Cooper, 1985), when there are many small weak firms in a

growing industry (Strebel, 1983). The circumstances for these firms are essentially the reverse of those in declining industries. If declines are modest, turnaround strategies in growing industries are relatively easy to implement. In growing industries, high-risk strategies, often referred to as bet-your-company strategies, that appeared attractive may have disastrous consequences. Escalating commitment strategies (Staw, 1981) will appear more attractive in growing industries than in declining industries. These high-risk strategies may be taken with full awareness of the risks involved, or managers may neglect or discount available adverse information. However, other stakeholders may be impatient with the pursuit of strategies that are not quickly successful. Since the industry is growing, most stakeholders will have other opportunities for the use of both financial and human capital. Suppliers will have alternate selling opportunities, and assets will be valuable to secured creditors. The external psychological atmosphere will be one of taking the necessary losses and moving on to better things. However, managers and equity holders may prefer to initiate high-risk continuation strategies since they have little or nothing more to lose and the recovery of past losses is possible, if not likely (Golbe, 1981; Grabowski & Mueller, 1972; Jensen & Meckling, 1976; Kahneman & Tversky 1979;).

H2. For all failing firms the rate of decline will be positively correlated with the growth in firm sales.

This hypothesis is related to H1, which states that for all failing firms the the rate of decline of net income for the firm will be positively correlated with the rate of sales growth of the industry during the five years prior to the failure. Firm sales should follow the industry pattern. For firms with growing sales the roots of failure are likely to be found in poor controls and management that allow costs to rise more rapidly than sales. Rapid growth would also be expected in the cases of firms failing as a result of high-risk expansions or acquisitions.

The emphasis on the multiyear growth pattern is important, because in the year immediately preceding bankruptcy the fatal collapse may have already begun, particularly if the bankruptcy comes early in the following fiscal year. For this and all other hypotheses, inflation adjustments are necessary to prevent inflated prices from obscuring real declines in sales. Alternatively sales might be measured in some physical unit.

H3. For all failing firms changes in equity/debt ratios, profit margins, net working capital, and retained earnings will have significant positive correlations with changes in net income.

In the long run these variables are logically, if not precisely mathematically, related for all firms, but the

relationships are much more rigid for failing firms. Successful firms are far less constrained in their strategic and financial alternatives. They can increase net income either by cutting margins and increasing sales or increasing margins on decreasing sales, and capital structure decisions will be less constrained by previous investors.

The hypothesized relationship is consistent with Gentry, Newbold, & Whitford's (1985a) cash-flow propositions, and the four related variables in Altman's (1983) Z-score bankruptcy prediction model all have the same sign. If net income is positive, the firm is not likely to fail. If net income is negative, retained earnings will decrease by accounting definition. It is unlikely that a firm with declining earnings will have increasing profit margins; it is more likely that a declining firm would cut margins to maintain sales. For the firm with declining earnings the first effect is most likely to be a decline in working capital, especially cash, although it possible that bloated inventories might overbalance other working capital changes. Troubled firms are unlikely to be able to attract new equity at attractive prices, so increased debt is almost universal for declining firms. The equity/debt ratio, the inverse of the more traditional debt/equity ratio, is used to be keep the signs consistent and to be consistent with Altman's (1983) Z-score model.

H4. The rate of decline in market value for a failing firm will be significantly lower than the rate of decline in book value in the five years preceding firm failure.

This hypothesis is based on both theory and observation. As Golbe (1981) has pointed out, equity and bond holders have different return profiles; the upper limit for the bond holder is set by the coupon rate, and limited liability sets the lower limit for equity holders. Although all stocks can be seen as call options on the firm's assets, this is more obvious at very low or negative book values (Strebel, 1983). As the firms approach bankruptcy, some of the value of debt is transferred to equity holders (Gordon, 1971). Castanga & Matolcsy (1981) found that market performance was a useful predictor of bankruptcy, but stocks continued to have value right up to the failure. Fruhan (1979) reports data that indicate that market value/book value ratio declines as the rate of return declines until the rate of return becomes very low, and then it increases. More recent work by the Strategic Planning Associates (1984) on the relationship between market and book values points to the same conclusion.

This hypothesis is also consistent with efficient market theory in its weak and semistrong forms and argues against the strong form. Stock prices follow information. The book value of a firm is an important factor in determining the market value of the firm, even though changes in the book value of the

firm may not be accurate indicators of the true course of decline. Managers can use accounting and operational techniques to obscure poor earnings, and book values of obsolete or underutilized assets may greatly exceed their economic value. Some care needs to be taken in testing this hypothesis since market value calculated from stock prices is much more volatile than book value, which is usually estimated quarterly and presented on an audited basis only annually.

The following propositions about failing firms are stated in this form, because the data necessary for statistical hypothesis testing is not available.

P1. The probability of firm failure will be negatively correlated with the degree of firm diversification.

Financial portfolio theory has frequently been extrapolated to business strategy and used to justify corporate diversification. However, in spite of numerous studies (Bettis, 1981; Christensen & Montgomery, 1981; Rumelt 1974, 1982 and others), the value of diversification remains equivocal, especially unrelated diversification. The observed results appear to be affected by sample selection, with both industry and time period sensitivity. Similarly a larger body of work in finance on conglomerates, summarized by Copeland & Weston (1983), provides little support for increased returns or decreased risk for large diversified firms. Neither stream of

research has deterred corporate managers from pursuing diversification strategies (Salter & Weinhold, 1979). The critical factor may be in the differing perceptions or definitions of risk (Baird & Thomas, 1985). Survival risk may be more salient for managers than variance in returns, which is the most commonly used measure of risk in the finance literature. Bankruptcy is often cited as a risk factor in the finance literature, but it is difficult to quantify.

From another point of view (Williamson, 1975) conglomerates can be seen as internal capital markets which can buy and sell units and reallocate resources. When a unit of the diversified firm becomes unprofitable, the firm has a wide choice of exit strategies which avoid the high financial and public relations costs of bankruptcy. Since the conglomerates have relatively low dependence on any specific business and may lack the specialized skills necessary to intervene in business unit turnarounds, conglomerates tend to divest troublesome units (Dundas & Richardson, 1982). If the declining unit is not easily divested immediately, it can be sustained until better exit conditions can be found (Duhaime & Grant 1984), assets can be transferred internally, or new strategies can be supported until they are profitable. Typically the divested unit is acquired by another firm, but it may be spun-off as an independent firm, as in the case of Wilson Foods, which went bankrupt in 1983, less than two years after being spun-off by the conglomerate LTV Corporation.

P2. Failed firms less than ten years old will decline more rapidly than firms more than ten years old.

It was recognized from the beginning that investigation of this proposition would be limited, since the study was limited to firms with five years or more of operations. Altman (1983) reports that over 50% of all business failures occur in years two through five, but the percentage is probably much smaller for large firms, such as those studied in this project. This proposition is related to H2, which states that firms in growing industries will decline rapidly, and firms less than ten years old are likely to be found in new and growing industries. Also, firms with short histories will have fewer incentives to hang on in the face of an unfavorable prognosis for future profitability.

P3. The majority of firm failures will follow within five years of a major environmental change for the industry or a major competitive shock within the industry.

The success or failure of any organization depends on its ability to respond in life-sustaining ways to changes in the environment. In the absence of environmental shocks, there is a low level of uncertainty, and the outcomes of actions are relatively easy to predict. In a stable environment, firms have time to correct internal weaknesses or find value-preserving exits. If problems are the result of poor

management, owners may have time to replace ineffective management teams.

Changes in the environment, either in the general socio-economic environment or within a single industry domain, introduce uncertainty which makes new strategic moves risky and shifts the relative value of existing competitive advantages. However, it is environmental shocks, specific events--not gradual changes or ordinary cyclical patterns in the general environment--that are most likely to cause business failure. The failure of a firm will not be the direct result of the broad environmental change; rather the change induces stress that makes a weak firm more vulnerable to firm-specific adversity, while stronger firms survive. In some cases generalized changes in the environment may precipitate firm-specific events. For example, changing social and legal attitudes towards product liability may underlie specific product liability suits.

Deregulation of an industry is a classic example of an industry shock, and it is frequently followed by the failure of some firms to compete successfully in the new environment. Bankruptcies have been rampant in the airline industry since deregulation. A competitive shock may also be a technological breakthrough by a competitor or the entry of a major new competitor. The entry of IBM into the personal computer industry was a major factor in the multiple bankruptcies in

that industry. Other environmental changes may come more slowly and more diffusely, particularly in declining industries. New technologies diffuse slowly (Cooper & Schendel 1976), imports erode domestic markets, and economic swings are usually only a few percentage points. Elements of change may be complex and interrelated, and specific causes of failure may be difficult to pinpoint beyond the general industry malaise.

It is not so much the environmental shocks that determine the outcome, but the managerial responses to those environmental shocks. Successful strategies are dependent on appropriate responses to the environment (Ansoff, 1984, Pfeffer & Salancik, 1978). Managers may be slow to respond to diffuse or weak signals (Mintzberg, Raisinghani & Theoret, 1976), thus allowing strategic drift which so weakens a company that recovery is difficult when the threat is recognized. Other ineffective managerial responses include attempting to apply inappropriate old solutions to new problems and escalating commitment to current strategies (Staw, 1981). Long delays in problem recognition may allow threats to grow to the point that managers panic at their magnitude (Janis & Mann, 1977; Smart & Vertinsky, 1984).

P4. The rate of decline for firms which fail within five years of a specific failure-related decision or event will be significantly higher than for firms without such critical events.

The slow decline part of this proposition follows from H1 and H2, which postulate that slow decline is associated with declining industries. It is consistent with the observation of Schendel, Patton & Riggs (1976), who claimed that multiple causes and lack of managerial attention were responsible for the declines they observed. Harrigan (1979) also found that the reasons for industry decline are often complex, slow-emerging, and debatable. In the absence of crisis and strong signals, firms tend to drift along with traditional responses to immediate problems, not seeing the environmental changes that may be transforming the entire industry structure. Even in declining industries some firms remain profitable or find value-preserving exits. There may be a lot of criticism of managerial judgment in declining firms, but little consensus on the specific cause of failure.

For failing firms with rapid declines there will tend to be one or two specific, identifiable firm decisions or events that were directly responsible for the failure. These events are what are frequently labelled "strategic surprises" (Ansoff, 1984). It also part of the larger assumption that rapid decline is associated with healthy industries, and therefore failure will be the result of either bad decisions or accidents, not the long-term trends found in declining industries. If the decision or accident is not quickly fatal, then recovery, not long-term decline, will be the likely

outcome. The rapid decline may be the result of some high-risk venture that proves to have been a mistake. For example, the Wickes Company bankruptcy came immediately after the Gamble-Skogmo acquisition. Although a sudden failure may be precipitated by specific events, it is possible that longer-term problems may have weakened the firm so that it is unable to withstand a sudden shock. The Penn Central bankruptcy can be attributed to the merger of the Pennsylvania and the New York Central Railroads, but both were declining firms in a declining industry prior to the merger. Braniff Airways had serious operational weaknesses, but it was the unprecedented expansion following deregulation that directly led to its bankruptcy.

Separating out the industry effects of P3 from the firm-specific events of this proposition may be difficult. A sudden change in the environment may place demands on the firm that it is poorly equipped to meet. Managers with skills critical in an early phase of the life cycle may be unsuited for coping with new problems that arise later in the life cycle (Pearce & Robinson, 1985). An abrupt change in leadership may signal a firm-specific crisis, or it may represent a recognition of a growing mismatch between the leadership and evolving critical contingencies for managers.

Hypothesis Testing Results

The hypotheses were tested as originally formulated, and in addition some were tested on a reformulated version based on the performance of a matching sample of nonbankrupt firms.

H1. For all failing firms the the rate of decline of net income of the firm will be positively correlated with the rate of sales growth of the industry during the five years prior to the failure.

The correlation between the rate of decline and the rate of growth in the industry was positive and significant ($r = .28$, $p < .02$), when the rate of decline was defined as:

rate of decline = 1 / number of losing years + 1.

The rationale for that definition was provided in Chapter 5. However, if the rate of decline was defined as the percentage change over the five years prior to bankruptcy, then the correlation was positive but not significant. In growing industries, firms typically were profitable for several years and then failed rapidly the last year or two. The results for the entire sample are shown in Table 6.2.

Table 6.2

Rates of Decline of Failing Firms

Number of Losing Years	Number of Firms
0	5
1	17
2	18
3	19
4	3
5	5
6	1
	73

Berven Carpets held the record of six consecutive years with negative net income. During that period its sales declined by 71% (28% on an inflation adjusted basis), and its assets declined by 73%. Berven was liquidated. Among the firms with no losing years were Revere Copper and Brass and the Charter Company. Revere's profits on its copper business more than balanced its losses in aluminum, and Charter's losses in the oil business were covered by its profits in financial services. Revere used the bankruptcy proceedings to divest its aluminum business, but Charter sold off its most profitable units and emerged from bankruptcy with a major portion of its oil business.

H2. For all failing firms the rate of decline will be positively correlated with the growth in firm sales.

The correlation between the firm's rate of decline and the firm's growth in sales ($r = .51$, $p < .001$) was stronger than for industry growth. In this and every other analysis, firm

sales growth (or decline) was a stronger predictor of firm performance than industry growth.

H3. For all failing firms changes in equity/debt ratios, profit margins, net working capital, and retained earnings will have significant positive correlations with changes in net income.

The movements were all in the direction postulated, but high variances and irregular patterns of decline limited the statistical significances. Equity/debt ratios and profit margins fell quite uniformly, but working capital and retained earnings had slow early declines followed by rapid declines as bankruptcy became imminent. The ROI fell rapidly, then had a slight upturn two years before bankruptcy, and then plummeted.

H4. The rate of decline in market value for a failing firm will be significantly lower than the rate of decline in book value in the five years preceding firm failure.

The hypothesis was not supported. Except for the obvious and expected decline in both book and market value for the bankrupt firms over the five years prior to bankruptcy, the study of a variety of market measures failed to uncover any statistically significant effects. The mean book and market values for both the bankrupt and matching firms are shown in Table 6.3 and Figure 6.1. The market behavior was consistent

with an efficient market theory. Both groups of firms started out with book and market values very nearly equal, but throughout the study period the market discounted the book value of the bankrupt firms, with the discount increasing until two years before bankruptcy. This was the period during which the bankrupt firms were adding to their assets at a higher rate than nonbankrupt firms, a strategy that contributed to their eventual failure. This point is discussed in more detail in a subsequent chapter. For the nonbankrupt firms the mean book and market values remained very close to each other. In the final reporting year for the bankrupt firms, the declines in market value did not keep pace with the declines in book value, but the differences did not approach statistical significance. As in the case of a number of other variables, the variance for the book value for the bankrupt firms in the last year was large. In that final year some firms had negative book value, while others had only begun to decline. The market value did not exhibit a similar increase in variance, perhaps because the market value can never be negative.

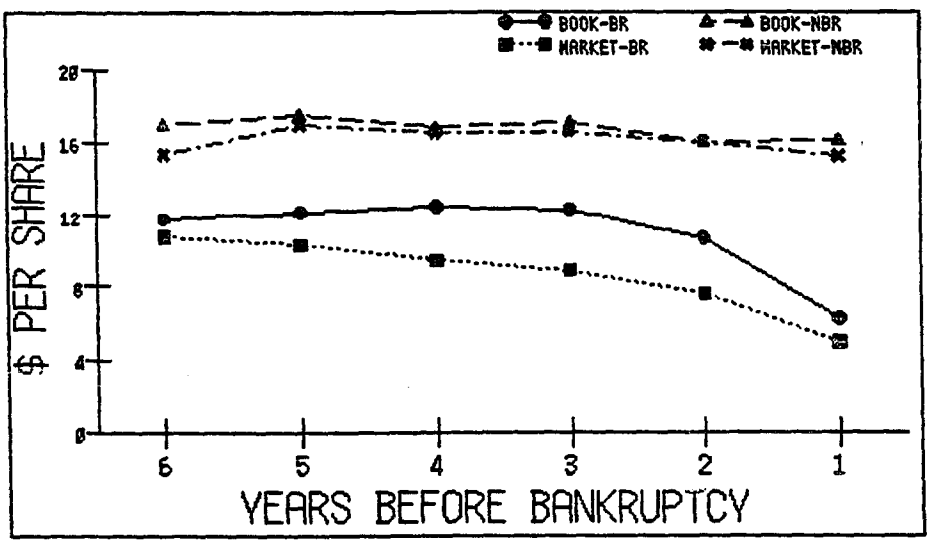
Table 6.3

Book and Market Value for Bankrupt Firms and a Matched Sample
(means with standard deviations in parentheses)

Year	Bankrupt Firms		Nonbankrupt Firms	
	Book	Market	Book	Market
6	11.75 (13.33)	10.72 (13.55)	16.98 (15.23)	15.37 (15.69)
5	12.15 (13.74)	10.28 (9.52)	17.52 (15.03)	17.00 (17.15)
4	12.47 (14.97)	9.41 (7.76)	16.85 (14.36)	16.59 (16.75)
3	12.24 (13.43)	8.83 (7.47)	17.10 (14.71)	16.60 (13.06)
2	10.66 (11.96)	7.58 (6.57)	16.04 (12.20)	16.07 (12.03)
1	6.24 (10.50)	4.92 (4.19)	16.18 (13.29)	15.27 (11.22)

Figure 6.1

Book and Market Values per Share
Bankrupt and Nonbankrupt Firms



Attempts to analyze market-to-book ratios produced erratic results, largely caused by near-zero denominators and negative book values for the bankrupt firms, which produced large variances. Using book-to-market ratios rather than the more

traditional market-to-book ratios avoided the problem of negative denominators, but some market prices approached zero. In the last year the book-to-market ratios for the bankrupt firms had a mean of 0.80 with a minimum of -10.20 and a maximum of 4.20. For the nonbankrupt firms the mean was 1.20 with a minimum of 0.42 and a maximum of 3.36.

Chapter Summary

The bankrupt and nonbankrupt firms were compared on a number of financial variables and bankruptcy prediction scores on a year-by-year basis for five years prior to the bankruptcy of the failing firms. At the beginning of the study period the bankrupt firms appeared to be weaker and more highly leveraged than the nonbankrupt firms, but the differences were not statistically significant, except for working capital, debt, and retained earnings ratios. By the end of the study period all the variables were significantly different, except for size as measured by sales and total assets.

The firms varied greatly on the length of the decline: one firm had six consecutive unprofitable years, while five had no unprofitable years prior to the year of the bankruptcy. The mean for the sample was 2.1 years. Two general patterns were observed. Some firms declined steadily in both sales and profitability, while others grew in sales and assets and failed after short periods of profit decline. Hypotheses about the

relationships between common financial ratios and between book and market value were not supported.

Chapter 7

BUSINESS DECLINE AND FAILURE PATHWAYS

Chapter Introduction

The preceding chapter focused on the internal characteristics of failing firms and their contrast with those of nonfailing firms. The primary emphasis of this chapter is on the relationship between internal firm characteristics and the industry environment of the the failing firms, with particular emphasis focused on firm and industry growth rates. Growth relationships are translated into risk factors based on concepts from strategic management and finance. These relationships and risks are then used to postulate a series of different decline pathways.

Theoretical Background

The decline and failure models proposed in Chapter 3 are sufficiently general to encompass a very large number and range of pathways that can lead from success to decline and failure. If they are to be useful, they need to be reduced in number and confirmed by application to actual case situations. If this can be done, they then can provide theoretical insights for the strategic management research literature and also practical

guidelines for managers in turnaround and decline situations.

There are two common, but quite conflicting, perceptions of the characteristics of failing organizations. One view is that of a once successful organization which is withering away either from maladaptation to an increasingly hostile environment or from internal ineptitude. The other view is that of an organization going down in flames, having unsuccessfully pursued a high risk strategy.

The withering-away view dominates the declining organization literature as summarized in Whetten's (1987) recent review article. Perhaps the most useful concepts from this research stream are decline typologies developed by Zammuto and Cameron (1985) based on the concept of changing environmental niches. Their four typologies are: (i) erosion, a gradual reduction in niche size; (ii) contraction, a sudden reduction in niche size; (iii) dissolution, a gradual change in niche shape (or a shift from one niche to another); and (iv) collapse, a sudden change in niche shape. In strategic management, the declining industry literature, dominated by the work of Harrigan (1979), is consistent with this view.

The going-down-in-flames view has multiple roots in the literature of strategy and finance. Strategy researchers note that new ventures, startups, industry entries, and product introductions all have high failure rates (Baird and Thomas,

1985). The turnaround literature adds to this viewpoint by making clear that it is profitability, not size, that is the critical measure of decline. That literature (Hofer, 1980; Hambrick, 1985) which distinguishes between strategic and operational declines/turnarounds also recognizes the distinction between internal and external causes of failure. A strategic decline or turnaround is seen to be externally oriented--what the firm does in response to its environment--whereas an operational decline or turnaround is internally oriented--how effectively a firm uses its resources. The finance literature (Altman, 1983, and others) emphasizes the business failure (bankruptcy) risks of excessive debt and highly leveraged strategies.

Failure Pathways

An organizational decline view of business failure leads to the expectation that failure will be associated with firms which are shrinking in size and/or operating in declining industries. The risk view would suggest that failure might well be associated with growth of the firm and/or the industry. The combination of the two views on a purely logical basis leads to four possibilities as shown in the simple two-by-two matrix in Figure 7.1.

Figure 7.1

Firm and Industry Growth Matrix: Failure Pathways

Firm Sales	Industry Sales: Declining	Industry Sales: Growing
Declining	1. Market Deterioration	2. Market Maladaptation
Growing	3. Fight for Market Share	4. Loss of Control

Not only are all four possibilities logically possible, but reasonable pathway scenarios can be depicted for each. One such set of scenarios follows:

1. Market Deterioration Pathway--A firm in a declining industry experiences declining sales and is unable to shift its resources to serve profitable product-markets. The industry decline is typically slow, but technological breakthroughs may precipitate a sudden collapse. Examples of slow decline along this pathway can be found in the steel industry.

2. Market Maladaptation Pathway--A firm experiences declining sales in a growing industry. Shakeouts in a growing industry are a common example of this pathway. Early leaders may find that their products cannot successfully compete with improved products from new entrants, or that they are unable to compete with firms which have lower costs or stronger marketing. Declining firms in volatile industries, such as toys and clothing, might follow this pathway.

3. Fight for Market Share Pathway--A firm pursues a growth

strategy in a declining industry, hoping to force competitors to exit or accept a disproportionate share of the industry decline. However, the firm experiences declining profits in spite of growing sales. The cause may lie within the firm, perhaps as a result of price cutting without compensating cost decreases. Alternately the cause may lie outside the firm, for example if competitors do not exit and escalate the fight for the available market. A fight for market share in a declining industry is a risky strategy, particularly if competitors have greater reserves of resources to cover losses.

4. Loss of Control Pathway--A firm experiences sales growth in a growing industry, but is unable to convert the sales growth into profitability. The cause may be internal, perhaps from allowing costs to increase without compensating price increases. Alternately the cause may lie outside the firm, for example if competitors develop advantages which permit price cutting or new entrants attempt to buy their way into the market. Industry deregulation and intense competition in the airline industry has driven a number of firms down this failure pathway.

All failing firms will fall into one of the four mutually exclusive categories. The identification of the pathway from this conceptual typology may have descriptive value, but it may provide little causal information. While declining sales in a declining industry may be a clear indicator of trouble, growing

sales in a growing industry would appear to be a favorable indicator. The question then becomes: are there some common factors which place some firms at greater risk of failure than others?

Risk Factors

In the context of a risk/return view of business performance, the pathways developed above are return-related, since decline is defined as negative net income. But since failure is also risk-related, it is important to consider risk factors as well. In selecting risk factors, an attempt was made to select factors which were causally related to failure and not just measures of risk, such as beta or the variance of financial data items. First, it seemed desirable to select factors which have been well-established, either in the theoretical literature or in conventional business wisdom. Second, for this cross-sectional study, it was important to define factors broadly to allow generalizability across firms and industries. The four factors selected are described below. Unlike the failure pathways described above, the risk factors are not mutually exclusive. All of the risk factors could appear in all the pathways, although some combinations may be unlikely, or unwise, if they are the result of deliberate choice. Although the descriptions of the risk factors will focus on their negative effects, particularly the increased risk of bankruptcy, it is important to recognize that risk may

be necessary to exploit opportunities or increase returns.

1. High-Growth Strategic Risk--High-growth strategies may be risky for several reasons. The assumptions on which strategy is predicated may be incorrect; e.g., markets may not develop and grow as anticipated, competitors may behave in unexpected ways, or new competitors may enter a market. The costs of expansion may be underestimated, or existing managerial competencies may be inadequate for an enlarged enterprise. There are numerous examples of firm collapses after excessive investment in high-growth strategies. Wickes went into bankruptcy less than two years after a merger with Gamble-Skogmo in 1980, which approximately doubled the firm size. Hindsight indicates that Wickes overpaid for Gamble-Skogmo. Other examples include the collapse of Penn Central following the merger of the Pennsylvania and New York Central Railroads, and the bankruptcy of Braniff following its rapid expansion after the deregulation of the airlines in 1978. In the Braniff case, Braniff's CEO Lawrence Harding mistakenly believed that deregulation was only temporary, leaving a brief "window of opportunity" for Braniff to move into the ranks of the major airlines.

2. Financial Leverage Risk--Financial leverage risk is one of the cornerstones of financial theory. Increasing the debt component of the capital structure is a risky strategy

(Hurdle, 1974). Increased debt may be associated with deliberate growth strategies, but this is not necessarily so. Operating losses may force the firm to borrow excessively just to survive. The bankruptcy of MGF Oil was primarily the result of excessive financial risk. In one year, MGF Oil increased its debt to $229 million from $80 million. At the same time its sales increased only to $114 from $72 million. During the next two years the firm lost over $170 million, leaving it with a negative equity of $38 million.

3. Environmental Risk--Increased environmental stress inevitably increases risk. Increase in stress may come as a result of a change in well-known existing factors, or it may come as a result of a radical change in the environment. Industry deregulation is good example of the type of environmental stress that can lead to business failure. Following the deregulation of the airline industry in 1978, there were 36 airline bankruptcies in eight years (Gladstone, 1986), including such large airlines as Braniff, Continental, Capitol, Air Florida, and Frontier. Other financially distressed airlines, including Eastern Airlines and People Express, have been forced into mergers to avoid bankruptcy. Increased regulatory intervention has driven several electric utilities with heavy investments in nuclear plants towards bankruptcy. Rapid growth in imports is another example of an external stress. It has been a major

factor in the numerous bankruptcies among textile and garment firms in the past ten years. The stress may not necessarily be industry-specific; it may be geographic or constrained in some other way. What is common to this pathway is that many firms are subjected to the stress, but the extent of the impact may be quite different from one firm to another.

4. Firm-Specific Risk--Firm-specific stress may be the result of a wide variety of causes, both natural and man made. For small firms, a fire or earthquake might result in failure, but even very large corporations are not immune to disasters that threaten their existence. Product liability bankrupted both Manville and A. H. Robins, although in the Manville case, asbestos liability was an industry-wide problem and not unique to the firm. The Bhopal disaster did not bankrupt Union Carbide, although the adverse effects helped drive a major restructuring of the firm. Criminal activity is another example of a firm disaster. The Equity Funding case is well known, and systematic looting of the firm over a period of several years by two CEOs was a major factor in the bankruptcy of Saxon Industries. A high level of managerial conflict is another example of firm-specific stress, as is the transition from family ownership control to professional management control. Control transition and the accompanying managerial conflict were critical factors in the decline of Pabst and Schlitz in the brewing industry.

The association of a failure with a pathway and the contributory risk factors can only begin to identify the most important elements in a specific failure. In most failures multiple elements will be evident, and compound stresses are difficult to manage. Actions taken to relieve one stress may exacerbate another problem, or a conventional solution to a problem may be ruled out by constraints from another quarter. Many failing firms find their financial options severely limited by restrictions imposed by prior lending agreements.

Pathway and Risk Factor Hypotheses

The prior examination of the pathways typology and the set of potential risk factors can be enriched by adding formal hypothesis testing to the descriptive approach taken so far. Only the four pathways and the first two risk factors are readily amenable to statistical analysis, as the last two risk factors are based on events that are unique to the firm or the industry. The following hypotheses are proposed on the basis of the discussion immediately above and the broader perspective of this research as a whole. The rationale for each hypothesis is summarized briefly here.

H1. Failing firms will increase their assets more rapidly than comparable nonfailing firms.

H2. Failing firms will increase their debt more rapidly than comparable nonfailing firms.

These two hypotheses are posited for firms in all four pathways. At an early stage the rapid growth in assets may reflect a deliberate strategy, but later it may be a risk-seeking response to failure. This hypothesis and the following one are largely based on prospect theory (Kahneman and Tversky, 1979) and escalating commitment theory (Staw, 1981; Whyte, 1986), which suggest that decision makers are more risk seeking in the face of failure than success. Asset and debt growth are linked by the financing of high-growth strategies with debt. The need to fund growth through debt may be more pressing for declining firms, because they may have less access to equity funding than strong firms.

H3. Failing firms in declining industries, the market deterioration and fight-for-market-share pathway types, will decline more slowly than failing firms in growing industries, market maladaptation and loss of control pathways.

Failing firms in declining industries will tend to decline parallel to the industry. In general, industries decline in response to evolving environmental conditions, and industries seldom suddenly disappear. On the other hand, failing firms in growing industries are more likely to be the victim of

firm-specific events, which tend to be played out over shorter periods of time. Also, firms in declining industries have fewer attractive exit strategies than firms in growing industries.

H4. Failing firms with decreasing sales, the market deterioration and market maladaptation pathway types, will decline more slowly than failing firms with increasing sales, fight-for-market-share and loss of control pathways.

Growth strategies are inherently risky, and decreasing sales may be an indicator of a risk-averse management unwilling to act decisively in the face of emerging danger signals. Decreasing sales suggest strategic weaknesses, while unprofitable growth suggests operational problems, which are generally more amenable to quick solutions. Also, the assets of firms with growing sales will be more attractive to outsiders, which may force action to resolve problems. The assets of firms with declining sales will have less value, and there will be less pressure from outsiders to act. This argument draws on the turnaround literature (as a leading reference, see Hambrick, 1985).

H5. Failing firms in growing industries will increase their assets more rapidly than failing firms in declining industries.

Industry growth provides an attractive environment, making investments in additional assets more attractive than in declining industries. The hypothesis would appear to be self-evident, except for the possibility that, consistent with prospect theory, declining firms in declining industries are willing to take greater risks than comparable firms in more favorable circumstances.

H6. Failing firms in growing industries will increase their debt more rapidly than failing firms in declining industries.

The arguments for debt are essentially the same as those above for assets, with the additional argument that firms in growing industries are more likely to find investors willing to accept additional debt than firms in declining industries.

H7. Failing firms with growing sales will increase their assets more rapidly than failing firms with declining sales.

H8. Failing firms with growing sales will increase their debt more rapidly than failing firms with declining sales.

Hypotheses 7 and 8 are the parallels to Hypotheses 5 and 6, substituting declining firm sales for industry decline as the failure threat. While industry growth signals an attractive environment, firm sales growth provides assurance

that the firm's strategies are working.

H9. For failing firms in growing industries increases in debt will be determined more by increases in assets than by declines in income, and the reverse will be true for failing firms in declining industries.

H10. For failing firms with growing sales increases in debt will be determined more by increases in assets than by declines in income, and the reverse will be true for failing firms with declining sales.

Failing firms by definition have negative net incomes, which is usually preceded by negative cash flows. When cash flows become negative, the firm's alternatives are either gradual self-liquidation or debt. Firms with declining sales or in declining industries will have less motivation to grow than firms whose sales are growing or which are in growing industries. However, with limited exit opportunities, firms may feel forced to borrow to keep going until a turnaround occurs or an exit opportunity arises.

Data Definitions and Calculations

In order to assign the failing firms in the research sample to the pathways and risk factors, the following classification rules and procedures were followed:

First, the rates of change in firm and industry sales, adjusted for inflation, for the failing firms were calculated for the last five-year period for which data were available. For a detailed description of the data collection and manipulation, see Chapter 5. On average both firm and industry sales exhibited slow growth during the period under study. The mean annual firm sales growth over the five-year period varied from + 90.68 to -31.30%, with a mean of + 0.25%. Industry annual sales growth varied from + 22.45 to - 15.92%, with a mean of +1.32%. The average growth in national industrial production was 2.40% for the same period. The growth rate for the sample would be expected to be lower than the industrial average, as declining industries were overrepresented in the sample. The firm sales growth rate was less than the industry growth rate, but this would be expected for failing firms.

Assets and debt include stock elements as well as flow, so meaningful quantitative inflation adjustments are more difficult for assets and debt than for sales. Consequently, high asset and debt growth were defined as a doubling in value (100% increase) for either variable over the five-year research period, rather than using an annually adjusted inflation factor. Given that the mean inflator for five years was 1.432, the doubling of assets and debt was comparable to a 40% increase on an inflation-adjusted basis. The mean noninflation-adjusted growth rate for failing firms was 95% for assets and 205% for debt. For nonfailing firms assets grew by

78% and debt by 69%.

Pathway and Risk Factor Assignments

Given the definitions and justifications above, the failing firms were classified using the following decision rules:

1. Market Deterioration Pathway--Any firm which had a negative sales growth in a negative growth industry.
2. Market Maladaptation Pathway--Any firm which had a negative sales growth in a positive growth industry.
3. Fight for Market Share Pathway--Any firm which had a positive sales growth in a negative growth industry.
4. Loss of Control Pathway--Any firm which had a positive sales growth in a positive growth industry.
5. High-Growth Strategic Risk--Any firm which reported total assets in the last annual report before bankruptcy which were double or more than those reported five years previously.
6. Financial Leverage Risk--Any firm which reported total liabilities in the last annual report before bankruptcy which were double or more than those reported five years previously.

Results

Path Classification Results

The classification of firms is summarized in Figure 7.2, and the detailed listings by pathway and industry are shown in Tables 7.1 and 7.2. Contingency table analysis indicated that the only significant deviations from random distributions were for the doubled debt and assets for firms with growing sales in growing industries.

Figure 7.2

Firm Sales and Industry Sales
Asset and Debt Growth Relationships

FIRM SALES	INDUSTRY SALES: Declining	INDUSTRY SALES: Growing	Totals
Declining	Path 1 TF 19 DA 1 DD 2	Path 2 TF 21 DA 1 DD 4	TF 40 DA 2 DD 6
Growing	Path 3 TF 10 DA 6 DD 6	Path 4 TF 23 DA 9 DD 17	TF 33 DA 15 DD 23
Totals	TF 29 DA 7 DD 8	TF 44 DA 10 DD 21	TF 73 DA 17 DD 29

(TF = Total Firms, DA = Doubled Assets, DD = Doubled Debt)

Table 7.1

Firms Classified by Decline Pathway

Firm	DNUM	CNUM		DOUBLED ASSETS	DOUBLED DEBT
Market Deterioration (Declining Sales, Declining Industry)					
Altec	3651	21438			
Auto Train Corp	4013	52755			
Beker Industries	2870	77266			
Berven Carpet Corp.	2270	86068			
Branch Industries	4210	105187			
Cook United	4210	216244			
Cooper Jarrett	4210	216687			
Crompton	2200	227129			
Eastmet	3310	277488			x
Garland Corp.	2300	366064			
K-tel International	3652	482724			
LTV Corporation	3310	565020			
Magic Marker Corp.	3950	559142			
Mobile Homes Ind.	5270	607386			
Richton International	3911	765516			
Smith International	3533	832110			
Tacoma Boatbuilding	3730	873452		x	x
Transcont. Energy	1381	895560			
Wheeling-Pittsburgh	3310	963150			
		Subtotal	19	1	2
Market Maladaptation (Declining Sales, Growing Industry)					
AM International	3550	1723			x
Barclays Industries	2400	67374			
Bobbie Brooks	2300	96779			
Continental Steel	3310	212072			
Glover Inc.	2010	379848			
Good, L. S. Co.	5311	382073			
Leisure Dynamics	3940	525400			
Lynnwear Corp.	2300	551675			
Mego International	3940	585163		x	x
Mesta Machine Co.	3540	590825			
Morton Shoe Cos.	5661	616390			
National Shoes	5661	637691			
Pathcom	3662	703191			
Poloron Products Inc	2450	731568			

Table 7.1 (cont.)

Firms Classified by Decline Pathway

Firm	DNUM	CNUM		DOUBLED ASSETS	DOUBLED DEBT
Market Maladaptation (Declining Sales, Growing Industry)					
Robintech Inc.	3079	771010			
Rusco	3442	781768			
Salant Corp.	2300	793897			
Stevcoknit Inc.	2250	860156			
Tobin Packing Co.	2010	888837			x
Upson Co.	2600	916745			x
White Motor	3713	964066			
		Subtotal	21	1	4
Fight for Market Share (Growing Sales, Declining Industry)					
Amfesco Industries	3069	31145		x	x
Berry Industries	3533	85776		x	x
Commodore	2450	202651			
Flame Industries Inc	3533	338486		x	x
Global Marine	1381	379352		x	x
Lionel Corp.	5999	536257		x	x
Phoenix Steel	3310	719151			
Revere Copper	3350	761406			
Solomon, Sam, Inc.	5999	834269		x	x
Steelmet Inc.	5093	858263			
		Subtotal	10	6	6
Loss of Control (Growing Sales, Growing Industry)					
Advent	3651	7551			
Anglo Energy	4210	35054		x	x
Argo Petroleum	1311	40138			x
Braniff Intl. Airway	4511	105425			x
CS Group	2300	126351			
Capitol Air	4511	140556			x
Charter Co.	5170	161177		x	x
Continental Airlines	4511	210795			
Data Access Systems	3683	237570		x	x
Gilman Services	5120	375847			
KDT Industries	5331	482455		x	x
MGF Oil	1381	552813		x	x
Manville Corp.	3290	565020			x

Table 7.1 (cont.)

Firms Classified by Decline Pathway

Firm	DNUM	CNUM		DOUBLED	DOUBLED
Loss of Control (Growing Sales, Growing Industry)					
Marion Corp.	2911	568695			x
McLouth Steel	3310	582273			x
Nucorp Energy	3533	670349		x	x
Robins, A.H.	2830	770706			
Sambo's Restaurants	5812	795872		x	x
Saxon Industries	2600	805567			
Storage Technology	3573	862111		x	x
Towle Mfg.	3914	892008			x
UNR Industries	3310	903185			x
Wickes Cos.	5411	967441		x	x
		Subtotal	23	9	17
		Totals	73	17	29

Table 7.2

Pathways by Industry

INDUSTRY AND FIRM	BR YR	SIC CODE	PATH	DOUBLE ASSETS	DOUBLE DEBT
Petroleum Industry					
Argo Petroleum	1986	1311	4		x
Anglo Energy	1983	1389	4	x	x
Charter Co.	1984	2911	4	x	x
Global Marine	1986	1381	3	x	x
MGF Oil	1984	1311	4	x	x
Marion Corp.	1983	1311	4		x
Nucorp Energy	1982	1311	4	x	x
Transcont. Energy	1984	1381	1		
		Subtotal	8	5	7

Table 7.2 (cont.)

Pathways by Industry

INDUSTRY AND FIRM	BR YR	SIC CODE	PATH	DOUBLE ASSETS	DOUBLE DEBT
Textiles and Clothing Industry					
Amfesco Industries	1985	3143	3	x	x
Berven Carpet	1983	2271	1		
Bobbie Brooks	1982	2330	2		
CS Group	1982	2339	4		
Crompton	1984	2211	1		
Garland Corp.	1980	2330	1		
Lynnwear Corp.	1981	2330	2		
Richton International	1980	3961	1		
Salant Corp.	1985	2310	2		
Stevcoknit Inc.	1981	2250	2		
		Subtotal	10	1	1
Process (Miscellaneous)					
Barclays Industries	1981	2400	2		
Commodore	1985	2450	3		
Glover	1980	2011	2		
Poloron Products	1982	2452	2		
Robins, A.H.	1985	2834	4		
Robintech Inc.	1983	3079	2		
Tobin Packing Co.	1981	2011	2		x
Upson Co.	1980	2661	2		x
		Subtotal	8	0	2
Metals and Mining					
Beker Industries	1985	2874	1		
Continental Steel	1980	3441	2		
Eastmet	1986	3312	1		x
LTV Corporation	1986	3312	1		
Manville Corp.	1982	3290	4		x
McLouth Steel	1981	3316	4		x
Phoenix Steel	1983	3312	3		
Revere Copper	1982	3351	3		
Rusco	1982	3442	2		
Steelmet Inc.	1983	3398	4		
UNR Industries	1982	3317	4		x
Wheeling-Pittsburgh	1985	3312	1		
		Subtotal	12	0	4

Table 7.2 (cont.)

Pathways by Industry

INDUSTRY AND FIRM	BR YR	SIC CODE	PATH	DOUBLE ASSETS	DOUBLE DEBT
Manufacturing					
AM International	1982	3550	2		x
Advent	1981	3651	4		
Altec	1983	3651	1		
Berry Industries	1984	3533	3	x	x
Data Access Systems	1983	3573	4	x	x
Flame Industries	1983	3533	3	x	x
Leisure Dynamics	1983	3944	2		
Magic Marker	1980	3953	1		
Mego International	1982	3940	2	x	x
Mesta Machine Co.	1983	3541	2		
Pathcom	1981	3662	2		
Smith International	1986	3533	1		
Storage Technology	1984	3573	4	x	x
Tacoma Boatbuilding	1985	3731	1	x	x
Towle Mfg.	1986	3914	3		x
White Motor	1980	3713	2		
		Subtotal	16	6	8
Transportation					
Auto Train Corp	1980	4011	1		
Branch Industries	1984	4213	1		
Braniff Intl. Airway	1982	4511	4		x
Capitol Air	1984	4511	4		x
Continental Airlines	1983	4511	4		
Cooper Jarrett	1981	4213	1		
		Subtotal	6	0	2

Table 7.2 (cont.)

Pathways by Industry

Distribution--Wholesale and Retail					
Cook United	1984	5311	1		
Gilman Services	1982	5122	4		
Good, L. S. Co.	1980	5311	2		
KDT Industries	1982	5311	4	x	x
K-tel International	1984	5099	1		
Lionel Corp.	1982	5945	3	x	x
Mobile Homes Ind.	1984	5271	1		
Morton Shoe Cos.	1982	5661	2		
National Shoes	1980	5661	2		
Sambo's Restaurants	1981	5812	4	x	x
Saxon Industries	1982	5111	4		
Solomon, Sam, Inc.	1980	5311	3	x	x
Wickes Cos.	1982	5211	4	x	x
		Subtotal	13	5	5
		Totals	73	17	29

The distribution of paths and risk factors by industry groupings appears to be consistent with industry reputations. Problems in industry classification and lack of information about the industry populations inhibited statistical testing of the results, but the simple count data were sufficient to make some qualitative observations. Also, it is important to recognize that all the quantitative industry growth rates used elsewhere in this study refer to narrowly defined industry classifications, while the industry groupings here are broadly defined and cover the entire research period. Consequently they typically include both growing and declining segments, so the results cannot be directly related to the results relating failure patterns to industry growth or decline.

The petroleum industry was characterized by high-risk strategies and high firm and industry growth, but the reported rate of growth in the petroleum industry needs to be interpreted with care. All growth rates were based on dollar volumes, and price increases for petroleum products were substantially higher during this period than the overall inflation rate.

For metals and mining firms differential price inflation rates may explain the lack of consistent growth patterns at both firm and industry level. However, both growing and declining firms were consistently risk-averse.

In the textile industry firms typically had declining sales and low-risk characteristics, regardless of industry growth or decline, which varied with industry segment and time period.

The process industries were a diverse group firms sharing a common emphasis on low technology conversion of raw materials to consumer goods, including meat and wood products. They typically had declining sales in a growing industry and were risk-averse.

Manufacturing firms, a very diverse group, were typified by declining sales and high-risk strategies. It may be that exit barriers were higher than for textile firms, or that banks

and finance companies were more willing to extend credit to firms with more capital assets to mortgage.

The transportation group included both trucking firms and airlines, which behaved very differently. All the trucking firms had declining sales in a declining industry and were low-risk. The airlines were growing firms in a growing industry and were relatively risk seeking.

The firms in the distribution group were highly diverse. The group included wholesalers, retailers, and one restaurant chain. Neither their pathway pattern nor their risk attitudes exhibited any significant consistency.

Quantitative Results

The previous section provided some qualitative and categorical analyses of the data on declining firms. This section will provide the quantitative data developed in this research and used in hypothesis testing, relying largely on the use of tables which are intended to be self-explanatory. The order of presentation will be rates of decline of failing firms, then comparative data for failing and nonfailing firms, and then comparative data by failure pathway type.

Table 7.3 shows the decline rates by path and path combinations. As described in Chapter 5 the decline rates were calculated using the formula:

rate of decline = 1/(number of years with net losses + 1).

Table 7.3

Rates of Decline

Path(s)	n	Rate	s. d.
1	19	.273	.109
2	21	.300	.111
3	10	.442	.215
4	23	.446	.248
1 & 2	40	.291	.110
1 & 3	29	.331	.171
2 & 4	44	.380	.205
3 & 4	33	.445	.235
Overall	73	.367	.206

The rates of decline for firms with declining sales, Paths 1 and 2, were nearly the same and much lower than for firms with growing sales, Paths 3 and 4, which were also quite similar. The differences in the rates of decline by path, using either single or combined path rates, were statistically significant only when the sample was partitioned on firm sales growth .

The comparative mean growth rates in sales, assets, and debt for the bankrupt and nonbankrupt firms are shown in Table 7.4. All the asset and debt growth rates in this study are based on data that was not adjusted for inflation. For comparative purposes the mean GNP deflator for the five-year

period studied for each firm was 1.42, so a nominal growth of 42% approximates real zero growth.

Table 7.4

Comparative Growth Rates in Sales, Assets, and Debt
Bankrupt and Nonbankrupt Firms
(means and standard deviations)

	Bankrupt % Increase over Five Years	Nonbankrupt	Difference (t test)
Sales*	106 (434)	84 (133)	n.s.
Assets*	95 (203)	78 (89)	n.s.
Debt*	205 (336)	88 (128)	pr < .01

Failing firms increased their sales, assets, and debt more rapidly than nonfailing firms, but only the difference in increases in debt was significant. As consistently noted throughout this study, the failing firms exhibited much greater variance in their behavior than nonfailing firms. Generally, small firms exhibited higher growth rates than large firms. This is demonstrated by growth rates for the sample means (the equivalent of size-weighted means) of the bankrupt firms which were: sales 49%, assets 69%, and debt 112%; for nonbankrupt firms: sales 27%, assets 33%, and debt 53%.

Figure 7.3, similar in format to the previous Figures 7.1 and 7.2, gives the quantitative growth rates by pathway, and Table 7.5 expands on that data.

Figure 7.3

Asset and Debt Growth by Pathway

Firm Sales	Industry Sales: Declining	Industry Sales: Growing	Totals
Declining	1. Market Deterioration n 19 AG 43.5 DG 91.8	2. Market Maladaptation n 21 AG -2.8 DG 92.0	n 40 AG 19.6 DG 91.9
Growing	3. Fight for Market Share n 10 AG 163.9 DG 245.2	4. Loss of Control n 23 AG 196.0 DG 383.1	n 33 AG 186.3 DG 341.3
Totals	n 29 AG 85.0 DG 144.7	n 44 AG 101.1 DG 244.2	n 73 AG 94.7 DG 204.7

AG = Asset Growth in %, DG = Debt Growth in %

Table 7.5

Assets and Growth Rates in Assets and Debt by Path
(means and standard deviations)

Variable	Path 1	Path 2	Path 3	Path 4
n	19	21	10	23
Total Assets ($ mil) Year 6	360.7 (922.2)	110.2 (193.4)	144.8 (201.7)	250.4 (301.7)
Asset Growth (%) Year 6 to 1	43.5 (166.0)	2.8 (40.3)	163.9 (153.4)	196.0 (277.8)
Debt Growth (%) Year 6 to 1	91.8 (216.2)	92.0 (180.3)	245.2 (206.5)	383.1 (477.0)

The relative size of the firms by pathway appears to be consistent with traditional wisdom about failing firms. Firms with declining sales in declining industries, Path 1, typically came from mature heavy industries and included the large steel

companies, LTV Corp. and Wheeling-Pittsburgh. It also included all three surface transport firms. The firms with declining sales in growing industries, Path 2, typically came from volatile consumer nondurables industries, such as textiles, clothing, toys, and retailing, which tend to be relatively small. Firms with growing sales in growing industries, Path 4, included most of the firms which had been subjected to specific firm or industry shocks. This group included three firms hurt by product liability litigation, Manville, A. H. Robins, and UNR Industries and three airlines which failed following the deregulation of the industry. The Path 3 group, growing sales in a declining industry, was small, and the firms in it were not easily categorized.

As can be seen from Figure 7.3 and Table 7.5, firm growth effects dominated industry growth effects. To further quantify the separate effects of firm and industry growth, a number of analyses were run using pooled data from pairs of pathway types. The results of those analyses are given in Tables 7.6 and 7.7.

The results decisively demonstrate the overwhelming dominance of firm effects, with both asset and debt growth showing significant differences between the groups of firms obtained by partitioning the sample on firm sales growth.

Table 7.6

Percentage Changes in Debt over Time by Groups
(standard deviations in parentheses)

Grouping Variable	Growing Firms		Declining Firms		Difference
	n	%	n	%	
			Five-Year Period		
Industry	44	244(391)	29	145(222)	n.s.
Firm	33	341(415)	40	92(196)	pr < .001
			Two-Year Period		
Industry	44	58(140)	29	45(80)	n.s.
Firm	33	80(152)	40	29(79)	n.s.

Table 7.7

Percentage Changes in Assets over Time by Groups
(standard deviations in parentheses)

Grouping Variable	Growing Firms		Declining Firms		Difference (t test)
	n	%	n	%	
			Five-Year Period		
Industry	44	101(224)	29	85(169)	n.s.
Firm	33	186(245)	40	19(119)	pr < .001
			Two-Year Period		
Industry	44	15(112)	29	8(47)	n.s.
Firm	33	80(152)	40	29(79)	n.s.

However, the differences arose relatively early in the five year prebankruptcy period; no differences were observed in the last two of those years. The strong effect of firm growth also outweighs the difference between failing and nonfailing firms. For failing firms with declining sales, assets grew more slowly than for nonfailing firms, while for failing firms with growing sales, assets grew more rapidly. Growth in debt displayed a

similar pattern, reinforced by the significant difference in debt growth between failing and nonfailing firms.

On average, the failing firms increased their debt more than their assets, a 205% increase in debt and a 95% increase in assets. Nonfailing firms also increased their debt more than their assets, but the difference for them was small, an 88% increase in debt and a 78% increase in assets. A possible added explanation for the failing firms' increasing debt was that they were using debt to cover income losses.

Table 7.8 shows the results of a regression analysis used to determine the relative importance of increasing assets and losses in income in explaining the increases in debt by the failing firms. The increase in debt, for each of the groups of firms and the pooled sample, was regressed on the change in operating income and net income and on the change in total assets, for the full five-year period prior to bankruptcy and the last two-year period. The results for operating income and net income were essentially parallel, so only the results for net income will be reported. In all cases R-SQ was high, ranging from .60 to .91. For each partitioned regression a Chow test was conducted to test for the equality of the coefficients, with the null hypothesis that they are equal (Chow, 1960; Hambrick and Lei, 1985).

Table 7.8

Regression Results: Change in Debt Regressed on Changes in Income and Assets (Pooled Sample, n = 73)

	FIVE-YEAR MODEL			TWO-YEAR MODEL		
	beta	t	sig.	beta	t	sig.
Change In:						
Assets	.83	10.67	***	.90	21.24	***
Income	-.02	-.25	n.s.	-.29	-6.73	***
R-SQ	.67			.87		
F	71.12			241.58		

PARTITIONED ON INDUSTRY GROWTH/DECLINE
FIVE-YEAR MODEL

	GROWING (n = 44)			DECLINING (n = 29)		
	beta	t	sig.	beta	t	sig.
Change In:						
Assets	.92	7.17	***	.93	11.53	***
Net Income	-.16	-1.28	n.s.	.05	.66	n.s.
R-SQ	.66			.84		
F	39.73			67.95		

Chow test difference not significant

PARTITIONED ON FIRM SALES GROWTH/DECLINE
FIVE-YEAR MODEL

	GROWING (n = 33)			DECLINING (n = 40)		
	beta	t	sig.	beta	t	sig.
Change In:						
Assets	.80	5.37	***	.82	8.70	***
Net Income	-.03	-.21	n.s.	.02	.20	n.s.
R-SQ	.60			.67		
F	22.92			38.25		

Chow test difference not significant

Table 7.8 (cont.)

Regression Results: Change in Debt Regressed on Changes in Income and Assets (Pooled Sample, n = 73)

PARTITIONED ON INDUSTRY GROWTH/DECLINE
TWO-YEAR MODEL

	GROWING (n = 44)			DECLINING (n = 29)		
	beta	t	sig.	beta	t	sig.
Change In:						
Assets	.92	20.02	***	.85	7.97	***
Net Income	-.32	-6.88	***	-.04	-.35	n.s.
R-SQ	.91			.71		
F	217.53			32.02		

Chow test difference not significant

PARTITIONED ON FIRM SALES GROWTH/DECLINE
TWO-YEAR MODEL

	GROWING (n = 33)			DECLINING (n = 40)		
	beta	t	sig.	beta	t	sig.
Change In:						
Assets	.96	15.75	***	.74	11.69	***
Net Income	-.01	-.22	n.s.	-.61	-9.66	***
R-SQ	.89			.85		
F	124.86			106.49		

Chow test difference significance $p < .05$

*** $p < .001$, * $< .05$, n.s. $p > .05$

For the five-year period before bankruptcy, change in assets was the only significant predictor of the change in debt in the pooled samples and all partitions. For the two-year period before bankruptcy, both the change in assets and the change in income were significant predictors of the change in debt in the pooled sample. When the sample was partitioned on industry growth/decline, change in income was significant for firms in growing industries, but not for firms in declining

industries. When the sample was partitioned on firm sales growth/decline, change in income was significant for firms with declining sales and not significant for firms with growing sales. However, change in assets had a higher beta coefficient than change in income, which indicates it was the more important predictor. In summary, increasing assets was the dominant driving force behind the failing firms' increases in debt. Income loss became important only in the last two years before bankruptcy, and then only for the group of firms in growing industries and the group of firms with declining sales.

Results of Hypothesis Testing

The results of the hypothesis testing are displayed in Table 7.9 below. The data used for hypothesis testing are provided in detail in the tables immediately preceding this section. In all cases the experimental results were in the direction hypothesized, but in several cases the results were not statistically significant. The relatively large variances for failing firm data items was a contributing factor in the failure to find statistical significance. In general, industry effects were weaker than firm effects.

Table 7.9

Summary Results of Hypothesis Testing

Hypothesis	Results*
H1. Failing firms in declining industries, market deterioration and fight-for-market-share pathways, will decline more slowly than failing firms in growing industries, market maladaptation and loss of control pathways.	Supported nss.
H2. Failing firms with decreasing sales, market deterioration and market maladaptation pathways, will decline more slowly than failing firms with increasing sales, fight-for-market-share and loss-of-control pathways.	Supported $p < .001$
H3. Failing firms will increase their assets more rapidly than comparable nonfailing firms.	Supported $p < .001$
H4. Failing firms will increase their debt more rapidly than comparable nonfailing firms.	Supported $p < .001$
H5. Failing firms in growing industries will increase their assets more rapidly than failing firms in declining industries.	Supported nss.
H6. Failing firms in growing industries will increase their debt more rapidly than failing firms in declining industries.	Supported nss.
H7. Failing firms with growing sales will increase their assets more rapidly than failing firms with declining sales.	Supported $p < .001$
H8. Failing firms with growing sales will increase their debt more rapidly than failing firms with declining sales.	Supported nss.
H9. For failing firms in growing industries, increases in debt will be determined more by increases in assets than by declines in income, and the reverse will be true for failing firms in declining industries.	Supported nss.

Table 7.9 (cont.)

Summary Results of Hypothesis Testing

Hypothesis	Results*
H10. For failing firms with growing sales, increases in debt will be determined more by increases in assets than by declines in income, and the reverse will be true for failing firms with declining sales.	Supported nss.

* Supported indicates the effects were in the direction hypothesized. Probabilities are given for statistically significant results; nss. = not statistically significant.

Discussion of Results

Chapters 10 and 11 of this dissertation are devoted to an extended and integrated discussion of the theoretical and managerial implications of all the results of the study, but there are some important observations about the results reported above which can appropriately be made at this point.

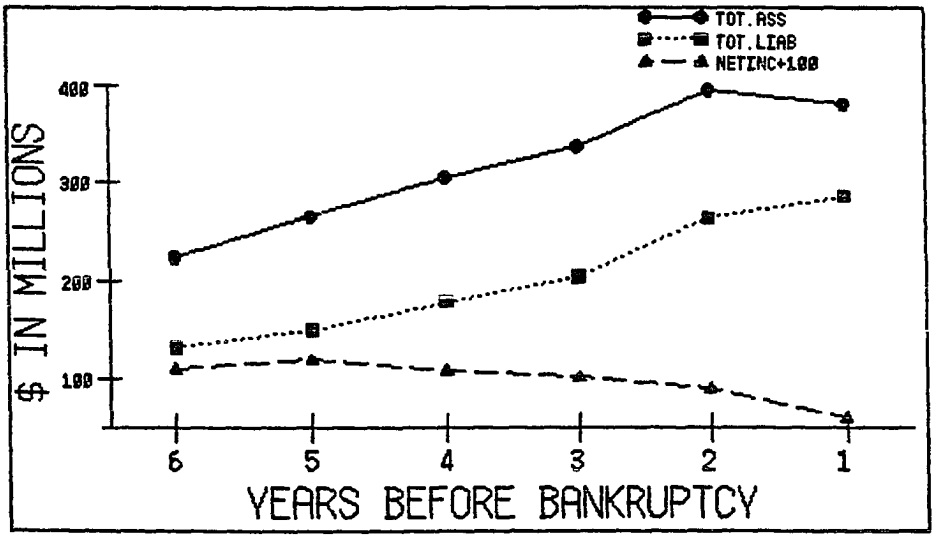
In the search for failure patterns, the sample of bankrupt firms was first compared to a sample of nonfailing firms. The sample of failing firms, taken as a whole, exhibited some important differences from a comparison sample of nonfailing firms. Although the comparison firms were matched for industry and size in the the selection process, the failing firms were somewhat weaker six years before bankruptcy on most financial indicators than the firms in a matched sample, which in turn were weaker than the general population of firms. The quantitative data for the sample of nonfailing firms used for

these comparisons were reported in Chapter 6, and the data for the larger population of firms were provided in Chapter 4.

In spite of, or because of, these weaknesses, the failing firms undertook greater risks, both strategic growth risks and financial leverage risks, than their more successful counterparts. Furthermore, they continued to pursue these risky strategies as performance declined, as is illustrated in Figure 7.4 (note that in that graph, net income has been adjusted by a constant increment of $100 million in order to make the relationships more visible). An extended investigation of this pattern of behavior is the subject of the next chapter in this study.

Figure 7.4

Assets, Debt, and Net Income



The failing firms were relatively evenly distributed across the four mutually exclusive, but collectively exhaustive, categories or pathways, based on whether the firms had growing or declining sales and whether the industries in which they operated were growing or declining. Of a total of 73 firms, 40 had declining sales, and 33 had growing sales; 29 were in declining industries and 44 were in growing industries. These results do not provide much help in developing a decline model, but they do dispose of any easy predictions about bankruptcy-prone environments, such as declining sales in a declining industry.

The behavior of the firms in each pathway were quite different from those in other pathways, and in some pathways quite different from that of nonfailing firms. Briefly summarized by pathway, the groups of firms had the following characteristics:

1. Market Deterioration Pathway. These were the firms with declining sales in declining industries. Asset growth was below average compared to both all failing and all nonfailing firms, and debt growth was about the same as for nonfailing firms, but lower than other failing firms. Like all failing firm groups, debt growth was substantially higher than asset growth. This group of firms declined most slowly.

2. Market Maladaptation Pathway. These were the firms

with declining sales in growing industries. Asset growth was much below average, actually negative, compared to both all failing and all nonfailing firms. Debt growth for these firms was the most disproportionate to asset growth of all firm groupings. These firms declined more rapidly than firms in Pathway 1, but more slowly than firms in Pathways 3 and 4.

3. Fight for Market Share Pathway. These were the firms with growing sales in declining industries. Asset and debt growth was above average compared to both all failing and all nonfailing firms. These firms declined more rapidly than firms in Pathways 1 and 2, but more slowly than firms in Pathway 4. The hazards of fights for market share are well-established (Fruhan, 1972).

4. Loss of Control Pathway. These were the firms with growing sales in growing industries. Asset and debt growth rates for this group were the highest of any group, and declines the most rapid. This was the largest subset of failing firms. It is not unreasonable to expect that managers in these circumstances which appear so favorable will be slow to recognize the hazards of rapid growth. The expectation that profitability will follow leads to the kind of overextension of resources that can result in sudden collapse.

The ordering of the groups on rate of decline, asset growth, and debt growth are about what would be expected.

Pathway 1, market deterioration, most clearly exemplifies the withering-away notion of decline, and Pathway 4 the going-down-in-flames notion. All elements of the study demonstrated the dominance of firm growth/decline effects over industry growth/decline effects, which reinforces the belief that the quality of managerial responses to environmental stimuli is critical for the survival of organizations in stressful environments. However, the strength of the deduction is limited by statistical considerations. Industry growth rates, which by definition are the weighted means of firm growth rates in that industry, should be less volatile than firm growth rates.

The greater variance in firm characteristics compared to industry characteristics was an obvious expectation, but the finding that failing firms were more volatile than nonfailing firms was less expected. One consistent observation throughout the study was that the variance for any data item was greater for the failing firms than for the nonfailing firms. The increased variance appears to be due to both strategy and time factors. In the face of stress and decline, firm responses were quite varied. Some firms pursued high-risk growth strategies, while others went into defensive hold or shrink strategies. Also, early in the five-year study period, some firms were quite profitable, and decline was late and rapid. Other firms followed other patterns, some declining early and hanging on, others declining steadily. As a result, in any one

year the research sample of failing firms was far less homogeneous than the nonfailing sample.

From a prescriptive standpoint, the most obvious warning coming out of the study is the high risk of debt-funded forced-growth strategies, particularly for weak firms or firms under stress. The firms in the study sample were all at least ten years old and sufficiently established for their stock to be traded on major exchanges, so it would be inappropriate to extend this prescription to businesses early in their life cycle.

There is little in the study to explain the motivation for strategies followed. Kahneman and Tversky's (1979) proposition that decision makers are risk seeking in the face of imminent losses, or Staw's (1981) escalating commitment propositions, may have been at work here. However, as Bowen (1987) has pointed out, it is difficult to distinguish between decision dilemmas and decision errors. It is possible that high exit barriers, either firm- or industry-specific, may have left some firms with few alternatives to staying in business until bankruptcy became inevitable. Any attempt to elucidate managerial motivation is limited by the exclusion of firm and industry-specific risks from the study, which in practice may dominate more generally applicable risks. For a firm-specific risk example, case data suggest that malfeasance in failing firms is a frequent contributor to failure.

A major tenet of modern finance, both in theory and practice, is the inverse relationship between risk and return. Unfortunately, the available data points only to the negative effects of increased risk. What is not known is whether there were comparably weak firms which successfully pursued similar high-risk strategies, and which were rewarded by survival and higher than normal returns.

Chapter Summary

Failing firms were found in all four quadrants of a matrix defined firm and industry growth, each quadrant representing a failure pathway. The pathways were: (i) market deterioration, declining sales in a declining industry; (ii) market maladaptation, declining sales in a growing industry; (iii) fight for market share, growing sales in a declining industry, and (iv) loss of control, growing sales in a growing industry. Two risk factors were defined as high-growth strategic risk and financial leverage risk.

Several significant relationships between the pathways and the rate of firm profit decline were observed. In general, firms with growing sales and assets declined rapidly in profits close to the bankruptcy date. Firms in growing industries also tended to decline rapidly. On average the failing firms exhibited higher growth rates than their nonbankrupt

counterparts. In general, the results suggest that high growth strategies carry significant failure risks. Debt for all failing firms grew more rapidly than for matching nonfailing firms. There was some evidence that while most debt was used to increase assets, some firms used debt to cover losses from operations.

Chapter 8

PATTERNS IN THE DECLINE OF THE BANKRUPT FIRMS

Chapter Introduction

The preceding chapter emphasized the growth and decline relationships between firms and the industries in which they operated. The focus of this chapter is on finding temporal patterns in the decline of bankrupt firms. The intent is to discover if there are sequential patterns in the financial indicators, which can be used to imply causal relationships. The financial indicators studied included the Altman bankruptcy prediction model variables, as well as the more traditional financial performance indicators. In addition, the patterns observed for the bankrupt firms are compared with those of the nonbankrupt firms. At this point no attempt will be made to analyze managerial behavior, but the case studies in the appendix may be useful in this connection.

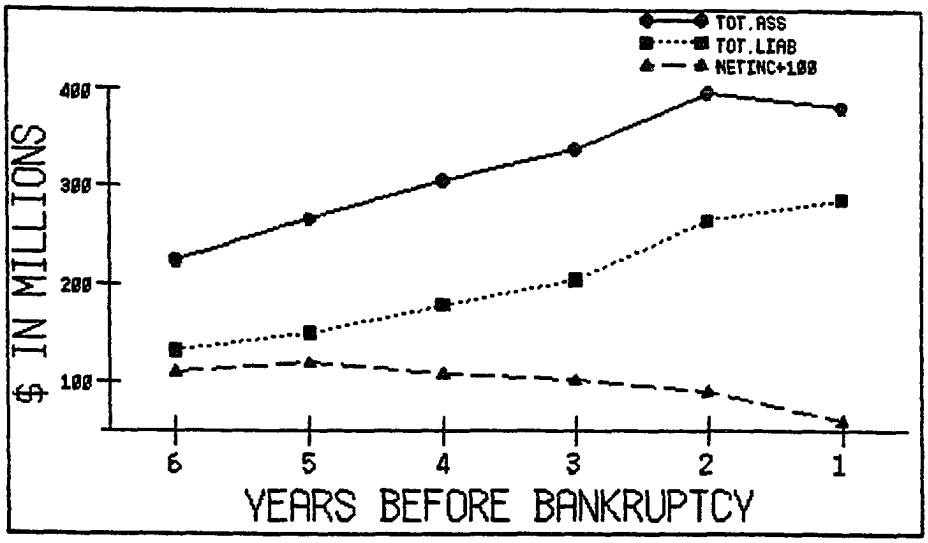
Patterns of Prebankruptcy Decline

At the end of the previous chapter it was briefly pointed out that on average the failing firms continued to expand their sales, assets and debts throughout the five-year period prior to bankruptcy in spite of an almost continuous decline in net income. In the five-year period under study, mean net income for the firms began to decline in year four and went negative in year two, yet the firms continued to increase their assets until the last year, when some were effectively in a self-liquidation phase. The firms continued to increase their debt to the very end. Figure 8.1, which is the same as Figure 7.4 in the previous chapter, provides a graphic display of this data. These observations led to a more detailed study of the behavior of the failing firms over time in order to elucidate the decline and failure process.

These patterns would appear to be indicative of escalating commitment (Staw, 1981) and/or risk-seeking behavior (Kahneman and Tversky, 1979), but insufficient information about managerial motivation was available to systematically pursue these possibilities. The case studies in the appendix do contain some information which would appear to be consistent with these explanations.

Figure 8.1

Changes in Assets, Debt, and Net Income



Quantitative Analysis of Prebankruptcy Decline

The original observations, which led to the the diagram in Figure 8.1, were based on the simple traditional measures of performance, assets, debt, and net income. In order to expand the exploration, a study was made of the changes in a number of key financial variables, with emphasis on the bankruptcy prediction variables introduced by Altman and expanded in this study. The bankruptcy prediction models were described in detail in Chapter 4. The Altman variables were attractive for two reasons. First, the Altman model has been widely used in academic studies and is extensively used by practitioners in

finance and banking. Second, the ratio variables used in the model have intrinsic value as measures of financial performance. In addition to the Altman Z-scores, the new Z-scores using the same variables, but with new coefficients, were examined. For information on the derivation of the new Z-scores see Chapter 4, page 67. In addition to a study of the behavior of the bankrupt firms, the performance of those firms was compared with that of the matched sample used throughout this study.

The means and coefficients of variation for all the Altman variables and Z-scores are shown in Table 8.1, together with the results of t tests which examine the significance of the difference between the means for the bankrupt and nonbankrupt firms. For easy evaluation of the variables and their changes as the firms approach bankruptcy, the results are presented in graphical form in Figures 8.2(a-f). Consistent with the findings at other points in this study the Altman variable X5, the sales to total assets ratio, had no distinguishing value either across time for the bankrupt firms or between bankrupt and comparison firms. For that reason, no further consideration will be given to that variable, nor will its exceptional behavior be noted in any generalizations that follow. For all the other variables and the calculated Z-scores, there were differences across time and samples.

Table 8.1

Progression of Indicators as Firms Approach Failure

Variable	Bankrupt Firms Mean	Bankrupt Firms Coef. Var.	Comparison Nonbankrupt Firms Mean	Comparison Nonbankrupt Firms Coef. Var.	Differences Ratio BR/NBR	Differences T Test Signif.
			Year 6			
MARGIN	.102	1.02	.120	.88	.85	
ROI	.037	2.14	.048	1.83	.77	
CASH/TA	.077	1.03	.092	.98	.84	
X1	.24	.83	.31	.55	.77	*
X2	.19	1.32	.31	.61	.61	**
X3	.10	1.20	.11	1.00	.91	
X4	1.02	1.58	1.39	1.04	.73	
X5	1.73	.50	1.66	.47	1.04	
AZ	3.21	.51	3.66	.37	.88	
NZ2V	1.44	1.15	2.15	.68	.67	**
NZ5V	1.39	1.16	2.10	.69	.66	**
			Year 5			
MARGIN	.098	1.04	.124	.79	.79	
ROI	.028	3.01	.056	.99	.50	
CASH/TA	.068	1.20	.098	.59	.69	
X1	.24	.75	.31	.55	.77	*
X2	.19	1.21	.31	.58	.61	***
X3	.09	1.22	.11	.82	.82	
X4	.84	1.12	1.48	1.13	.57	**
X5	1.80	.54	1.64	.45	1.10	
AZ	3.13	.47	3.70	.40	.85	*
NZ2V	1.31	.97	2.23	.72	.59	***
NZ5V	1.25	.98	2.17	.73	.58	***

Table 8.1 cont.

Progression of Indicators as Firms Approach Failure

Variable	Bankrupt Firms Mean	Bankrupt Firms Coef. Var.	Comparison Nonbankrupt Firms Mean	Comparison Nonbankrupt Firms Coef. Var.	Differences Ratio BR/NBR	Differences T Test Signif.
			Year 4			
MARGIN	.085	1.28	.124	.79	.69	
ROI	.002	80.87	.055	1.17	.04	
CASH/TA	.044	4.27	.098	.70	.45	
X1	.23	.83	.31	.55	.74	**
X2	.17	1.24	.32	.59	.53	***
X3	.06	2.17	.12	.67	.50	***
X4	.72	1.46	1.68	1.29	.43	***
X5	1.73	.62	1.71	.51	1.01	
AZ	2.87	.52	3.96	.45	.72	***
NZ2V	1.15	.99	2.42	.80	.48	***
NZ5V	1.10	1.01	2.35	.81	.47	***
			Year 3			
MARGIN	.073	1.68	.122	.86	.60	
ROI	.005	14.43	.054	.96	.09	
CASH/TA	.047	1.68	.095	.57	.49	
X1	.22	.86	.29	.62	.76	*
X2	.15	1.40	.32	.56	.47	***
X3	.05	2.00	.11	.73	.45	***
X4	.65	1.40	1.37	1.01	.47	***
X5	1.71	.66	1.66	.52	1.03	
AZ	2.73	.55	3.65	.39	.75	***
NZ2V	1.05	1.09	2.17	.65	.48	***
NZ5V	.99	1.11	2.10	.66	.47	***

Table 8.1 cont.

Progression of Indicators as Firms Approach Failure

Variable	Bankrupt Firms Mean	Bankrupt Firms Coef. Var.	Comparison Nonbankrupt Firms Mean	Comparison Nonbankrupt Firms Coef. Var.	Differences Ratio BR/NBR	Differences T Test Signif.
			Year 2			
MARGIN	.058	1.88	.116	.92	.50	
ROI	-.037	-2.80	.049	1.47	-.76	
CASH/TA	.010	8.69	.091	.75	.11	
X1	.16	1.63	.30	.67	.53	***
X2	.09	4.22	.32	.56	.28	***
X3	.01	10.70	.11	.91	.09	***
X4	.46	1.33	1.64	1.13	.28	***
X5	1.70	.68	1.66	.52	1.02	
AZ	2.34	.60	3.82	.45	.61	***
NZ2V	.69	1.62	2.40	.71	.29	***
NZ5V	.61	2.13	2.32	.74	.26	***
			Year 1			
MARGIN	.008	19.73	.113	.84	.07	***
ROI	-.165	-1.58	.048	1.70	-3.44	***
CASH/TA	-.110	-2.29	.092	.83	-1.20	
X1	.02	17.50	.31	.61	.06	***
X2	-.10	-3.80	.32	.66	-.31	***
X3	-.07	-3.29	.11	.82	-.64	***
X4	.27	1.19	1.60	1.03	.17	***
X5	1.75	.59	1.67	.51	1.05	
AZ	1.61	1.09	3.81	.47	.42	***
NZ2V	-.21	-7.00	2.36	.73	-.09	***
NZ5V	-.31	-4.87	2.29	.74	-.14	***

Coef. Var. = Coefficient of Variation
T Test Significances: * p < .05, ** p < .01, *** p < .001

Patterns of Behavior in Prebankruptcy Decline

Before moving to a consideration of the patterns for each variable, some general patterns are worthy of attention. For every variable, except sales/total assets, and every year, the bankrupt firms had lower mean scores than the nonbankrupt firms, although not all the differences were statistically significant in the early years. For the bankrupt firms the mean scores for all variables declined monotonically as the firms approached bankruptcy. For the comparison firms none of the variables showed any consistent or significant pattern of change over time. The degree of variability in the variables was consistently greater for the bankrupt firms than for the comparison firms, as indicated by the coefficients of variation presented in Table 8.1. Also, for the bankrupt firms the coefficients of variation increased as the firms approached their failure date.

Figure 8.2a

Changes in X1, Working Capital/Total Assets

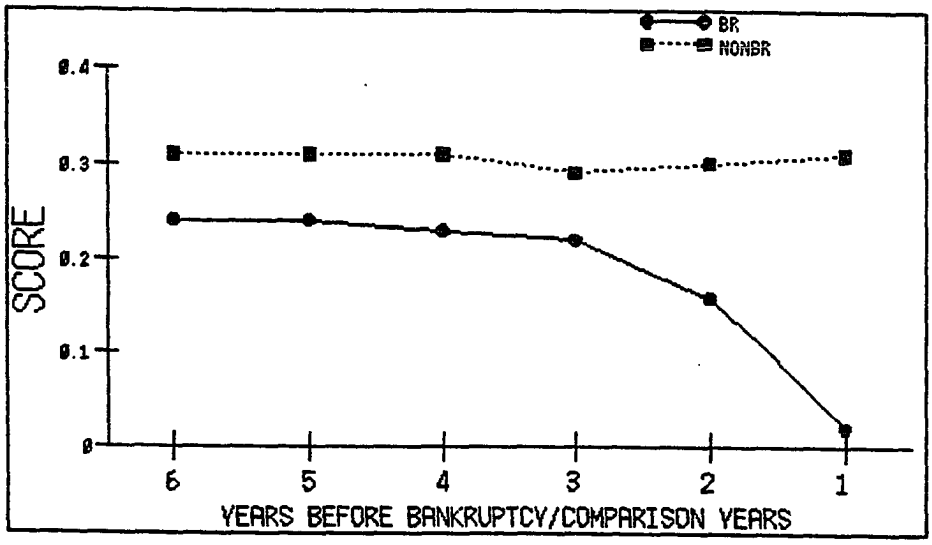


Figure 8.2b

Changes in X2, Retained Earnings/Total Assets

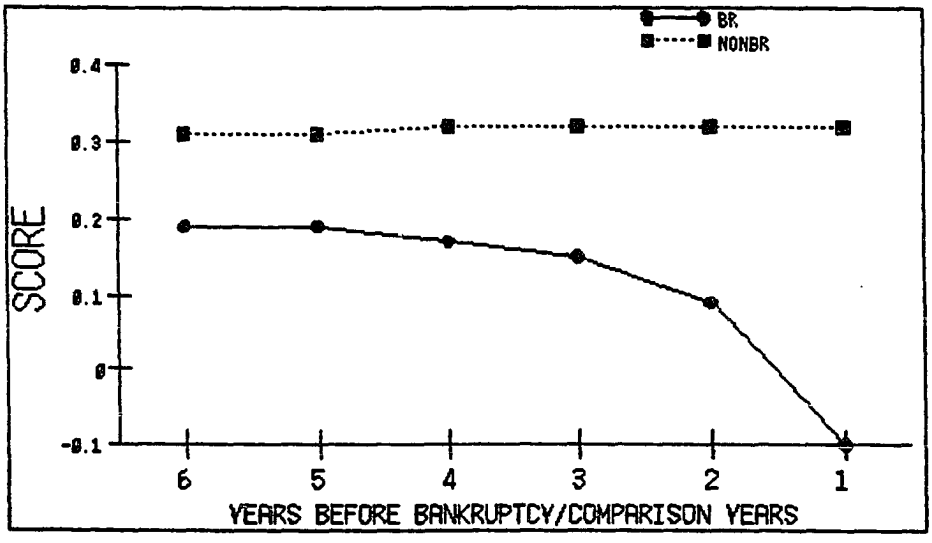


Figure 8.2c

Changes in X3, EBIT/Total Assets

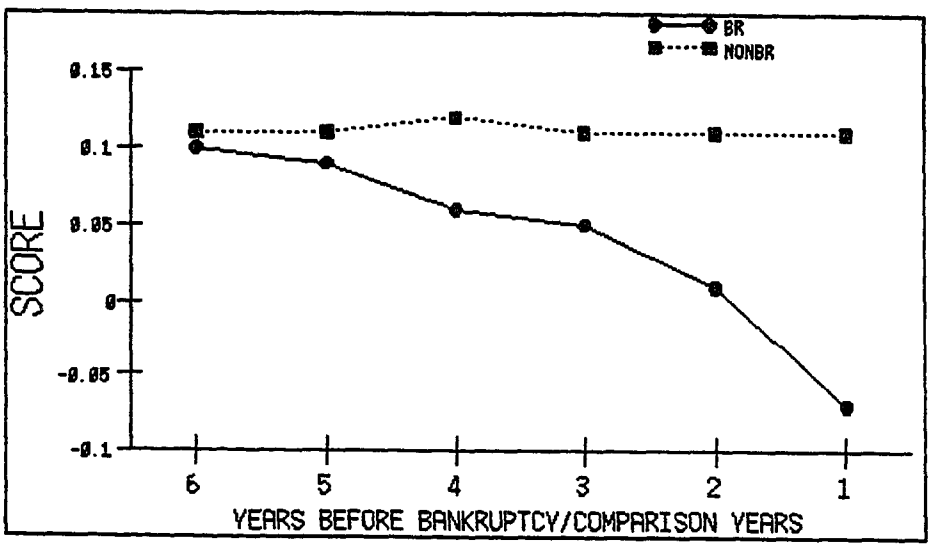


Figure 8.2d

Changes in X4, Mkt. Value of Equity/Total Liabilities

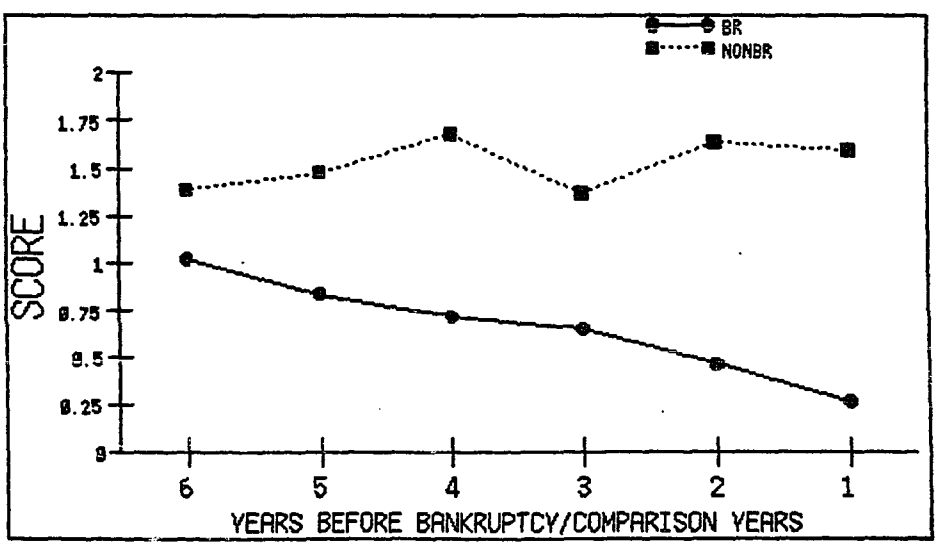


Figure 8.2e

Changes in X5, Sales/Total Assets

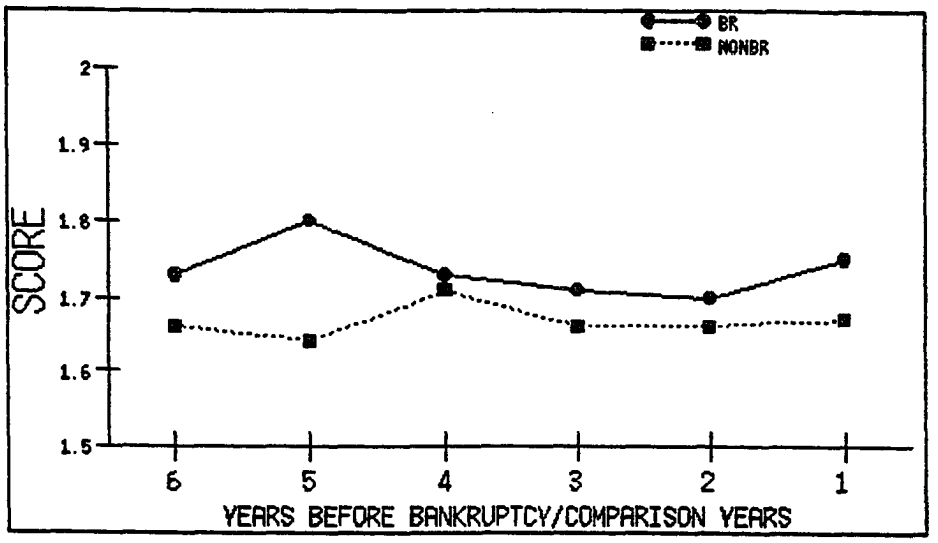
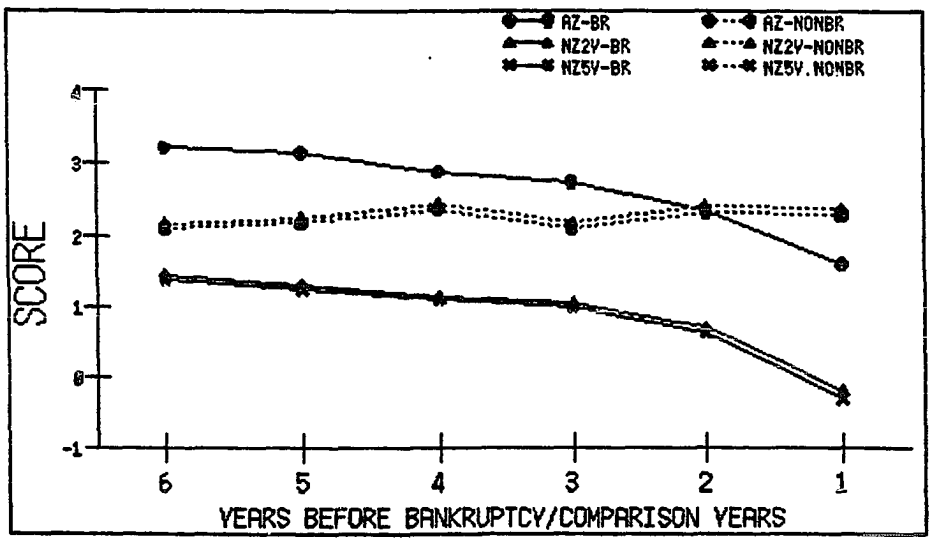


Figure 8.2f

Changes in Altman and New Z-Scores



The decline patterns for the separate variables were quite distinctive. Each will be considered separately, and then an attempt will be made to relate the separate patterns. The generalizations made here apply to mean values, and extensions to specific firms would be inappropriate. In many cases the increasing rates of decline were the result of more firms experiencing decline, rather than increasing rates of decline for individual firms.

The first variable, X1, the working capital-to-total assets ratio, was significantly lower for the bankrupt firms than for the nonbankrupt firms in all years before bankruptcy. However, it declined only slightly until the last two years and was the last variable to begin the steep decline. From year six to year three the ratio declined from .24 to .22, but then went to .15 in year two and to .02 in year one. The great decline in the last year was in part due to the reclassification of long-term debt to a current liability when it was called, because firms failed to meet their debt covenants. The mean long-term debt declined slightly, $125.55 million to $124.07 million, from year two to year one, while current liabilities increased from $122.03 million to $146.77 million. The observation here parallels Gentry, Newbold, and Whitford's (1985a) finding that the working capital variable in their funds flow model diverged dramatically for the bankrupt firms relative to the nonbankupt matched sample in the last year before bankruptcy.

The second variable, X2, the retained earnings-to-total assets ratio, was significantly lower for bankrupt firms than for nonbankrupt firms in all five years. It remained relatively stable in years five and four, and then began a steep decline. The decrease of the ratio in years four and three was marked by increases in total assets and slow growth of retained earnings. In years two and one the mean net income for the firms was negative, which reduced retained earnings and which in turn drove the ratio down.

The third variable, X3, the EBIT-to-total assets ratio, was lower for bankrupt firms in all years, but not significantly so in years six and five. The rapid decline began between years five and four and accelerated as the decline process continued. The acceleration in the rate of decline was the result of an increasing number of firms with negative EBITs, as well as increasing rates of decline for firms with early declining EBITs. Of the 73 firms in the sample, six never had a losing year, 17 had only one losing year, and 18 had only two losing years, all based on the more difficult to attain net operating income rather than EBIT.

The fourth variable, X4, the market value of equity to total book value of liabilities, was lower for bankrupt firms in all years, but not significantly so in year six. Between year six and year five it began to decline, largely as a result

of increased liabilities rather than declining market value. In subsequent years the decline in value came as a result of both declining stock prices and increasing debt. The decline over the five-year period was quite uniform, and unlike the other variables, did not exhibit a dramatic decrease from year two to year one. The extent to which it held up in the last year was in part due to equity-for-debt swaps by some firms.

The Z-scores, which are a composite measure of the individual variables, were calculated year-by-year using both the traditional Altman formula and the new formulas, NZ5V and NZ2V, developed in this work, as described in Chapter 4. The Z-score labelled NZ2V uses only the X2 and X4 variables, while NZ5V uses all five of the variables. All the Z-scores, Altman's and the new ones, were calculated using the coefficients derived from the data for the year preceding bankruptcy. The problems in using Z-scores based on coefficients derived in one year and variables based on data in other years were discussed in Chapter 4. In this case the use of coefficients derived separately for each year would have given slightly different numerical results, but several checks indicated that the observed patterns and the conclusions drawn would not have been affected.

The general patterns of results were about the same for all three models, but the new models showed some quantitative superiority over the Altman model. The two-variable and

five-variable models' results were essentially identical, which was consistent with similar findings about the descriptive importance of key financial variables presented throughout this study. The new models exhibited greater statistical significance in years six and five than the Altman model. The bankrupt-nonbankrupt ratios of the Z-scores deviated more from unity for the new models than for the Altman model, another indicator of the greater discriminating power of the new models. The new models weight X2, the retained earnings-to-total assets ratio, more highly than any other variable, and higher than the Altman model, and X2 was also the variable that exhibited the greatest difference between bankrupt and nonbankrupt firms in years six and five.

Discussion of Results

In discussing the results, an attempt will be made to develop a bankruptcy scenario based on the variable patterns. To do this one needs to consider the behavior of individual firms, as well as the collective behavior of the firms in the sample. As noted above, accelerating declines in the variables may have come from increasing rates of decline for individual firms or from an increasing proportion of the firms in the sample which were failing. Rather than attempting to separate these effects, the approach here will be to detach the scenario from the time line and assume that the basic patterns were similar in sequence, but varied in elapsed time.

Before looking at the firms' failure behavior patterns during the five or six years prior to bankruptcy, it is important to note that, on average, the firms in the bankrupt sample were weaker than the firms in the matching sample by every measure at the beginning of the study period. The greatest difference was in retained earnings, which is important for two reasons. Retained earnings are a component of common equity, which is an obvious consideration in measuring the financial strength of the company. In addition, retained earnings are derived from prior profits, which signals that the company had been successful at some time in the past. A strong equity position without retained earnings may signal a risky investment waiting for a disaster. Furthermore, the firms in the bankrupt sample were more highly leveraged than the comparison firms. The mean market values of equity-to-total liabilities ratios of 1.02 for the bankrupt firms and 1.39 for the nonbankrupt were not statistically different (t test $p = .14$), but they do point in the correct direction. When the book value of equity was substituted for the market value the t test significance moved to $p < .05$, indicating the significant differences between the debt levels of the bankrupt and nonbankrupt firms. The various Z-scores, which were composite indicators, all were lower for the bankrupt firms at the beginning of the study. Although the Z-scores were lower for the firms in the bankrupt sample, they were at or above the bankruptcy prediction model cutoffs until

year two.

Knowing that the bankrupt firms were weaker than the comparison firms at the beginning of the study period is not enough to understand why they went from weakness to failure. As developed in more detail in a previous section, the bankrupt firms increased their total assets and debt more rapidly than the comparison firms. This observation and the early decline in X4, the equity-to-debt ratio, suggests that one element of the road to ruin is forced growth. Forced growth was particularly dangerous for these failing firms, as they exhibited early and accelerating declines in operating margins. In other words, the failing firms were earning less on an increasingly larger asset base. In the absence of unit cost and price data, it was not possible to determine whether the declining margins were due to inadequate cost control or the inability to set profitable price levels. One might conjecture that the increasing fixed costs arising from increased asset bases compelled the firms to cut prices to maintain volume. In addition, the increased debt increased interest payments, but the margins declined before the debt service costs were factored in. As the operating income declined and debt coverage costs increased, net income became negative and retained earnings declined. Since one of the primary functions of retained earnings is to cushion the firm against financial shocks, declining firms lose their capacity to survive either external or internal shocks, such as recessions, competitor

surprises, or managerial mistakes. The problem may be compounded by the reduced willingness of current or prospective creditors to risk additional capital.

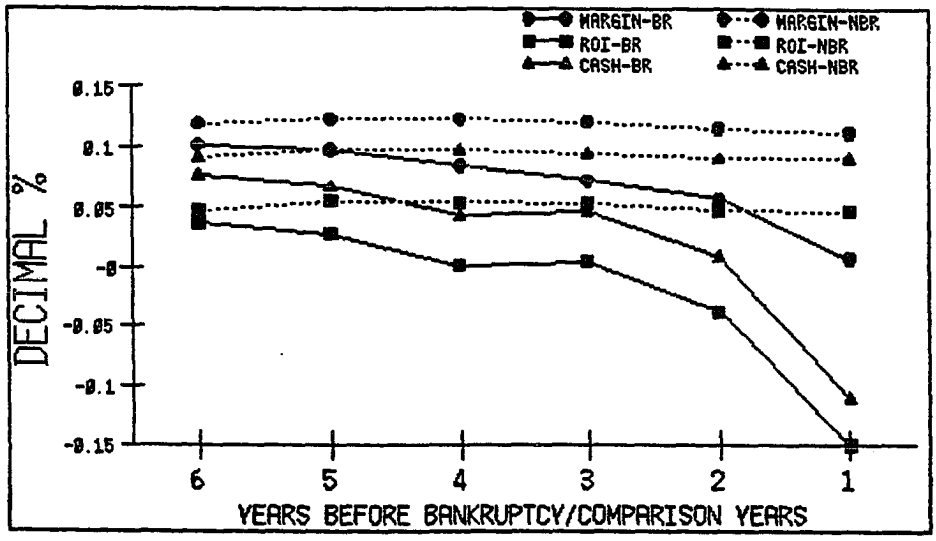
Once firms are weakened by declining income and increased debt, they become vulnerable to cash flow crises. The observed late and dramatic decrease in X1, net working capital, was one indicator of the cash flow problems. In order to gain further evidence on this point, cash flow was measured directly. For the purpose of the investigation, the simple definition of cash flow as the sum of net income plus depreciation charges was used. The relationships between operating income, net income, and cash flow are shown in Table 8.1 and Figure 8.3.

In large measure these variables duplicate the Altman ratios, except for the treatment of depreciation. Operating margins were based on earnings before depreciation, and X3, EBIT, after depreciation. Cash flow and net income moved almost exactly in parallel, and declined faster than operating margins in the last two years, although cash flow was negative only in the final year. Cash flow issues have received a great deal of attention in bankruptcy literature, but this analysis helps to separate balance sheet weaknesses from cash flow problems and shows the longitudinal relationships between them. Positive cash flow provides the financial slack necessary for change, innovation, and defenses against new threats. Reduced cash flow limits these life-preserving responses. Beyond the

point that a firm has inadequate cash to meet current commitments, the firm will be unable to survive without major interventions, such as sales of assets, mergers, or new ownership interests.

Figure 8.3

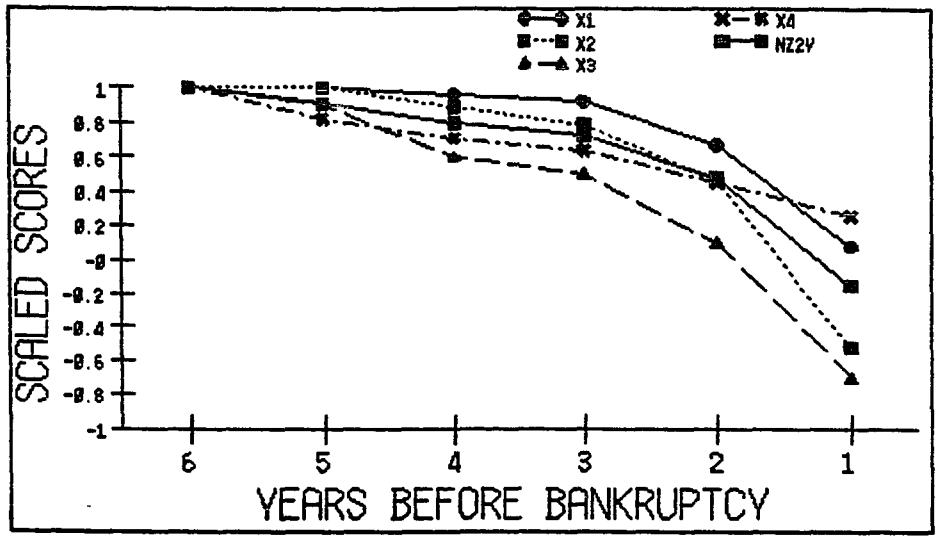
Changes in Margins, ROI, and Cash Flow



The interactions of the timing patterns for the decline were more interesting than the individual variable patterns taken alone. In Figure 8.4 the decline patterns have been plotted for the four significant variables and NZ2V, the Z-score based on the new two-variable model. In order to make the visual comparison easier, the variables and NZ2V have been scaled with the value for year six set to 1.00.

Figure 8.4

Changes in Key Indicators
(Scaled to Year 6 = 1.00)



From the graph, the pattern pointed out above can be clearly seen: X4, the equity/debt ratio, falls first; then X3, EBIT; then X2, retained earnings; and last X1, working capital. What is more striking is the accelerating rate of decline of the variables, except for X4, the equity-debt ratio. For the new Z-scores and for X1 and X2, the declines in the last year were greater than the sum of the declines for the four previous years. The picture that emerges fits the characteristics of the catastrophe model that was developed in Chapter 3. The decline appears to proceed over paths that were or could be reversible, until a point is reached where a collapse sets in that inevitably leads to a catastrophic conclusion. In the cases studied here, that conclusion was bankruptcy, but there

are other possible outcomes, such as voluntary liquidation, merger, or rescue by an external agency.

The timing patterns also help explain the difficulty in predicting bankruptcy much more than two years in advance. Starting from scores lower than those of the matching firms, the Z-scores for the bankrupt firms did not fall to the cutoff levels until about the the end of year three, and the decline in the following year was modest compared to the last year. The results reported here were similar to those reported by Altman (1983) in his study of the same trends for years five to three, but Altman found larger declines for year three to two than for the final year. The new Z-scores appear to pick up the decline a little bit earlier than Altman's, but the differences are small. In this analysis, as in all others, the two-variable and five-variable models performed essentially identically. In major part this is due to the heavier weighting of the variables in the two-variable model than in the five-variable model. The performance of the new Z-scores across the prebankruptcy period is stabilized by the early emergence of the importance of X4, the equity/debt ratio, and the late strength of X2, retained earnings.

The overall results suggest the following failure scenario. Weaker than average firms tend to pursue high-growth strategies, largely funded by increasing debt, even though the failing firms had higher debt ratios than the matching firms at

the beginning of the study period. As the debt increases, debt service costs increase, which reduces net income, which in turn leads to diminished retained earnings on an annual basis. The decreasing level of returns may be a direct effect of increasing cost of goods sold or an indirect effect of increasing the base on which returns must be calculated, or both. The accelerating problems of increased debt service and operational costs then jointly lead to cash flow problems. As the problems increase, so does their visibility, which in turn reduces the firm's credibility with customers, suppliers, and financial markets. In the late stages of the scenario, the downward spiral becomes irreversible and catastrophic.

The failure pattern observed in this study is consistent with a computer simulation model developed by Pondy (1986). His model, based in part on observations of bankrupt firms, and in part on theoretical considerations, had as its primary theme the hazards of growing assets more rapidly than sales. Pondy believed that firms overresponded to growth signals and invested too much in capacity increases which turned out to exceed demand.

Chapter Summary

The progression of mean values of financial performance and bankruptcy prediction variables were reported for each of six consecutive years for the sample of bankrupt firms. As

reported in several of the previous chapters, the bankrupt firms were weaker than their comparison counterparts at the beginning of the study period, and further deteriorated year by year. Also, as reported in previous chapters, the failing firms increased their assets and debts more rapidly than the nonfailing firms.

The pattern that emerges from the data is that firms first increase their assets using debt to finance the growth. This growth is followed by a decline in operating margins, then in the retained earnings to total assets ratio, and finally by a decline in net working capital. The increased debt and reduced retained earnings subject the firm to the risk of balance sheet bankruptcy; the decline in net working capital can lead to cash flow bankruptcy. Although the pattern seems to be fairly consistent in both slow and rapid declines, the length of time required for a firm to pass through the sequential stages varies substantially. It is this variation in elapsed time that makes early detection of bankruptcy difficult. The differences in elapsed time may be contingent on either environmental or firm-specific factors. Slow declines may be associated with capital-intensive declining industries, while rapid declines may be associated with risky managerial decisions.

Chapter 9

BANKRUPTCY OUTCOMES

Chapter Introduction

The three preceding chapters of this dissertation have been devoted to studies of the decline and failure of bankrupt firms. This chapter takes up the topic of bankruptcy outcomes. Bankruptcy is not a final event for a failing firm; it is a formal process for determining the eventual outcome, which can be either liquidation or reorganization or some combination of the two. The outcomes for the firms in the research sample will be reported, and an attempt will be made to identify the factors which determined those outcomes. This will be followed by a brief discussion of the development of models for outcome predictions.

Alternative Bankruptcy Outcomes

The previous sections of this study have examined and tracked the history of bankrupt firms during decline and through the declaration of bankruptcy. The declaration is not the end of the story, although there is a strong tendency in both academic writing and business practice to treat bankruptcy as a terminal event. The legal and social role of bankruptcy

is much more than a funeral ritual. Bankruptcy has evolved as a process for rehabilitating debtors and for the equitable distribution of assets of individuals and businesses unable to meet their obligations to creditors.

The United States Bankruptcy Code has separate provisions for reorganizations (Chapter 11) and liquidations (Chapter 7), but the legal distinctions between liquidation and reorganization oversimplify the range of possible outcomes. A better way of classifying bankruptcy outcomes is on the basis of whether or not the bankrupt firm has been perpetuated as an autonomous organizational entity and whether or not the core business of the bankrupt firm is continued. Each classification is independent of the other, so all four possible permutations are possible and commonly observed. Figure 9.1 summarizes the possible outcomes.

Figure 9.1

Possible Bankruptcy Outcomes

		ORGANIZATIONAL CONTINUITY: Yes	ORGANIZATIONAL CONTINUITY: No
BUSINESS CONTINUITY	Yes	Going Concern	Acquisition by Others
	No	Corporate Shell	Liquidation

Even the partition of outcomes exhibited in Figure 9.1 is oversimplified. For firms with multiple business units prior to bankruptcy, some units may continue as going concerns, while

others may be sold to other organizations or liquidated. Furthermore, the classification of businesses with organizational continuity, but with significant reduction in size, may come down to a judgment call.

Using the more formal model for bankruptcy developed in Chapter 2, bankruptcy can be seen as a procedure for the orderly redistribution of a firm's assets and resources when a firm's resources and outputs are insufficient to meet the legitimate claims on them. In the broadest sense those resources and outputs, both current and future, are assets to be restructured in settling the claims of stakeholders. The outcome of a particular bankruptcy then is the result of that restructuring. The assets to be restructured include both financial and organizational assets, and in most instances they are separable in many different ways. As a result, outcomes can vary from minimal change in the prebankruptcy structure to the complete disappearance of any recognizable remains. In order to understand the possible outcomes, a thorough review of the character of the assets to be restructured and the alternatives for their distribution or restructuring must be undertaken.

Previous discussions of bankruptcy have largely focused on financial assets and their distribution and restructuring, and organizational assets have been neglected. Financial assets would include the following:

1. Cash
2. Other working capital.
3. Capital assets, land, equipment.
4. Tax attributes.

Organizational assets which need to be considered include the following:

1. Corporate identity and charter.
2. Core business or businesses.
3. Ownership control.
4. Top management.
5. Other human resources.
6. Intangible assets.

These lists are not comprehensive, but they are sufficient to suggest that combinations and permutations of these assets can lead to a wide variety of outcomes. The problem in developing a conceptual framework is compounded by the extent to which the assets are separable as classes and divisible within a class. Also, in considering the restructuring of the assets, it is important to recognize that there are potentially many more participants in the process than those identified on the right hand side of the balance sheet of the bankrupt firm, and the restructuring may add new stakeholders during the reorganization process. The discussion that follows is intended to suggest a few of the many possible outcomes with emphasis on the experience of firms included in this study.

To simplify the analysis that follows, the restructuring alternatives are described in objective terms in order to suggest the range of possibilities and some criteria for selection among them. In reality, the bankruptcy process is always marked by divergent stakeholder preferences, and, as a result, the process tends to be characterized as much by human factors and conflict resolution as by objective financial analysis. Not only will stakeholders have differing estimates of liquidation values, potential future earnings, and other quantitative factors, but they will also differ in their subjective preferences, such as risk, time constraints, and personal commitment. To add to the complexity, the subjective and quantitative factors will interact as the stakeholders pursue their individual objectives. Some of the alternatives tend to produce winner-take-all outcomes, while others generate more opportunities for compromise. Straight liquidations tend to lead to the former, while reorganizations tend to have the flexibility to provide something for everyone.

Organizational Restructuring

Figure 9.1 presents one way of classifying bankruptcy outcomes based on whether or not the organization has been perpetuated as an autonomous legal entity. If it has, the firm has been reorganized; if it has not, the firm has been liquidated. Both the bankruptcy chapter and the corporate charter are convenient indicators of legal status, but they may

tell very little about the restructuring of the bankrupt firm's assets. In Chapter 7 liquidations, the assets may be sold in a single package to be operated under new ownership with little real change other than the ownership. Firms may also be liquidated under Chapter 11. Chapter 11 liquidations differ from Chapter 7 liquidations in that they are managed by the debtor in possession, rather than by a court-apppointed trustee.

In Chapter 11 reorganizations, distinguishing the differences between an amended charter, a rechartering, and a new charter can be just a semantic exercise. In some cases, the reorganized firm may be only a miniscule shell of its former self without productive assets and controlled by new owners, maintained only to preserve potentially useful tax attributes. This scenario is a reasonably accurate description of the outcome of the Mego International and Mobile Home Industries bankruptcies. In the Auto Train case, the bankrupt firm was involved in litigation which had a potential for payment of judgments which could be distributed to creditors at a later date.

Corporate Identity and Character

There is a question as to whether a publicly traded company that emerges from bankruptcy as a privately held company has maintained its identity or not. All of the firms

in the research sample were publicly traded prior to their bankruptcy, but several emerged as privately held firms. For an example of even greater complexity, in the case of Phoenix Steel, Guardian Ventures provided cash and loan guarantees in exchange for all of the common stock of the reorganized firm, but later at least a portion of the common stock was sold to the public and the firm is again publicly traded. Some reorganized firms are not publicly traded, because they are truly privately held, but in other cases the amount of stock in the reorganized firm available for public trading may be insufficient to meet exchange requirements. Historically, bankruptcy was immediate cause for delisting by major exchanges, but that is no longer true. At present the stock of smaller bankrupt firms is typically delisted or shifted to a lesser exchange, but other firms, such as Manville, LTV, and Storage Technology have continued to be traded on the New York Stock Exchange all through the bankruptcy process.

If the charter of the bankrupt firm is not preserved, the business organization may still survive relatively intact by being brought under the corporate charter of an existing firm. This may occur with little or no diminution of the organization's assets and the retention of its organizational identity. KDT Industries was acquired by Ames Department Stores, and Saxon Industries became a subsidiary, Paper Corporation of America, of Alco Standard in the bankruptcy process. This outcome is barely distinguishable from the case

in which the firm is reorganized, but is acquired or merged after the reorganization process is complete. Revere Copper and Brass was bought out by Jamie Securities in 1986 after emerging from a very successful reorganization in 1985. Corporate charters may be maintained to preserve tax attributes, but those attributes may also be preserved in mergers or acquisitions.

Effect on the Core Business

From practical economic and organizational viewpoints the effect of bankruptcy on the core business or businesses of the bankrupt firm may be more important than the effect on its legal status as a corporate entity. The effect may be either qualitative or quantitative. At one extreme the firm's entire business may be discontinued and the physical assets dispersed by piecemeal sales. If the business continues, either under the original organizational structure or under a new corporate parent, the size may range from larger than prebankruptcy to very much smaller. Continental Airlines emerged from bankruptcy larger than it went in, while Braniff emerged as an airline only about 10% of its prebankruptcy size. Diversified multibusiness firms may keep some businesses and dispose of others. Charter Company sold off profitable insurance and financial services businesses in order to rebuild its petroleum marketing business. Revere Copper and Brass used the bankruptcy process to unload a major portion of its

unprofitable aluminum business. The economic bases for making decisions of this type are essentially the same as for similar decisions by nonbankrupt firms, but the decision making process may be complicated by the complexity of conflicting stakeholder claims and preferences and by Bankruptcy Court bureaucracy. This may lead to the preservation of organizations and businesses with inadequate capital to effectively compete and survive.

Ownership Issues

Ownership and top management of a bankrupt firm can be considered either as assets or claimants on those assets. In many bankruptcy cases they have little asset value, and their claims are vulnerable. A classic definition of bankruptcy is the state in which the claims of creditors exceed the assets of the firm, so in effect the ownership claims are extinguished. Actually most of the ownership losses usually take place prior to formal bankruptcy. In publicly held firms with wide stock distribution, it is often difficult to identify individual losers, since losses are spread among many stockholders through sequential sales of stock at ever declining prices. In most bankruptcy reorganizations, common stock is either cancelled or severely diluted, but there are exceptions. In other cases the shares maintain their nominal value, but value of the owned assets is decreased. The bankruptcies of Continental Air and Revere Copper and Brass were executed with minimum loss to

equity holders, although there were major fluctuations in stock price during the process.

Ownership control and the value of ownership are separable. If a bankrupt firm settles its creditors' claims by selling off large parts of the firm's assets, there may be no loss of ownership control of the diminished firm that remains. Alternately, if the creditor claims are settled by an equity-for-debt exchange, then there may be a change in ownership without reduction in size or corporate identity. A variation on the straight equity-for-debt exchange is the sale of new stock to a third party with the proceeds used to pay off the creditors. Other variations include the acquisition of the bankrupt business by a solvent firm in exchange for stock in the acquiring firm to be distributed to the current creditors. A great many of these transactions involve the cancellation or dilution of old common stock and the issuance of new preferred stock. Preferred stock with its hybrid debt-equity character is well-suited to this use. The prior debt holders continue to have a priority claim on the firm's earnings, while the firm is given time to restore profitability with a reduced threat of a debt default which could precipitate another bankruptcy. Under the Bankruptcy Code, individuals are allowed only one bankruptcy every seven years, but there are no restrictions on the repetition of bankruptcy by corporations. In effect, the reorganized firm is treated as a new organization. The preferred stock is often broken up into a series of issues,

each with different preferences on earnings, future liquidation rights, voting, and conversion to common stock. Braniff issued six series of preferred stock, two of common stocks, and one of warrants in connection with its reorganization. The series was structured so that the Pritzkers, who provided the financing for the reorganization, had voting control and first claim on earnings, while the old creditors had first priority in claims for any future liquidation.

Managerial Control Issues

Successful firms often claim that their most valuable asset is their top management team. Conversely,there is a strong tendency to blame top management for business failure. All of the literature on turnarounds (Hambrick, 1985; Hofer, 1980; Bibeault, 1982; Schendel and Patton, 1976) stresses the importance of new leadership in the rehabilitation of failing firms. In addition, in the case of bankruptcy there is frequently a change in ownership control and strategy preferences. The old management may be replaced by new management or a bankruptcy trustee, and even if the old management remains as debtor in possession, debt holders and other creditors become powerful forces in decision making once the firm enters bankruptcy. The presiding bankruptcy judge also has extensive powers, particularly if the other parties cannot agree on issues. Characteristically the debt holders and bankruptcy court officials are more risk-averse than equity

owners and typical managers, and they may impose restraints on continuing managers or replace old managers, presumed to be loyal to the equity holders, with new managers selected for a different set of skills and loyalties. It should be noted that classification of managers as old or new may not be simple. Failing firms have often been declining for several years prior to filing for bankruptcy and may have had several rounds of managerial turnover. Braniff had a series of chief executive officers prior to bankruptcy, and Howard Putnam, who came in just prior to the bankruptcy filing, was replaced before the reorganization was complete. In the case of Wickes, Sanford Sigoloff, who was brought in to turn around a rapidly declining business, promptly took the company into bankruptcy. He retained his leadership position throughout the reorganization process and still controls the reorganized firm. It is extremely rare for a single individual to maintain control over the entire span of decline, reorganization, and postbankruptcy operations. In part this is a natural result of the time span involved, which on average probably exceeds the average tenure of chief executives. The periods during which managerial turnover is most likely to occur are the period of rapid decline just prior to the acceptance of the bankruptcy option and the period when the reorganization plan is being implemented. Once the bankruptcy process is initiated, there may be reluctance to change managers until the outcome is clear. Then a change in management may be the price for getting a settlement. For example, the approval of the

Manville reorganization was held up by demands for the replacement of J. A. McKinney, the chief executive officer who had been a senior manager of the firm for more than thirty years.

Preservation of Organizational Resources

Below the top management level human resources are treated much the same as financial and physical resources. If the business is to be perpetuated, the retention of quality personnel may be a high priority. On the other hand, the reorganization process may permit the elimination of unproductive employees on either an individual or unit basis.

Physical and financial resources could be considered as components of the organizational structure, but for the purpose of this discussion, they will be treated as a part of the financial restructuring. Before proceeding to that discussion, it is important to recognize that the successful reorganization and rehabilitation of a bankrupt firm cannot be accomplished without provision for an appropriate base of human, physical, and financial resources for the reorganized firm. If the reorganized firm is to be much smaller than it was originally, the base may be small. If the scope and scale of the firm is to be maintained, the success of the reorganization may depend not only on the retention of all existing assets, but also on an infusion of additional resources.

Financial Restructuring

Valuation Issues

Mapping financial restructuring in bankruptcy is simpler and more quantitative than organizational restructuring. It has also received more critical academic attention, but much of it has been overly simplistic. As in organizational restructuring, the first question is whether the bankrupt firm is to be reorganized or liquidated. In the standard financial literature, the essential question is whether the liquidation value of the firm is more or less than its value as a going concern (Bulow and Shoven, 1978; Ang & Chua , 1980). Neither value is known with certainty, and most of the suggestions for estimating the values are simply forms of financial planning, augmented by some rules of thumb for estimating liquidation values. Little or no academic attention has been paid to partial liquidations, a common outcome in practice. Presumably the estimation of liquidation and going concern values for business subunits would be quite similar to those for entire firms, and the selection of units for retention and disposal would be similar to the management of a portfolio of businesses in any diversified firm. The legal constraints, time limits, and conflicts of interest and control involved in bankruptcy tend to depress the sale value of assets of bankrupt firms, making the problems more difficult than those in normal business portfolio management and far from the simplicity of

theoretical choice models.

Public Policy Issues

While the financial literature focuses on valuation issues, bankruptcy law and practice have a public policy thrust, as well. The bankruptcy court has responsibility for the general social and economic welfare, as well as the financial welfare, of debtors and creditors. For example, the liquidation and dispersal of the assets of a public utility would not be an acceptable outcome, unless another supplier was immediately available. In some cases of this sort, such as Lockheed, Chrysler Corporation, and others, the problem was preempted by government action to prevent bankruptcy, rather than by working out solutions in the bankruptcy courts. In recent years, employee claims, including employment security and pension benefits, have increasingly become an issue in bankruptcy proceedings. For companies that fail after an extended period of unprofitablility, unfunded pension and health benefits for retirees may be their largest liability. In the case of Wheeling-Pittsburgh, unions and the big creditor banks had major battles over the amount of financial sacrifice they expected from each other. The LTV Corporation has transferred unfunded pension liabilities in excess of two billion dollars to the federal Pension Guaranty Board. In another case, United Airlines' pilot union blocked United Airlines from rescuing Frontier Airlines, which forced Frontier

into bankruptcy. Frontier pilots had accepted major wage cuts as part of a plan to save Frontier, and United pilots feared that the reduced wage contract would adversely affect their wage structure, which they had just won in a bitter dispute with United Airlines management.

Distribution of Assets

The bankruptcy process, whether for liquidation or reorganization, requires a complete accounting for the assets of the bankrupt firm and the projected distribution of those assets. If the firm is to be substantially reorganized, it is standard procedure to include pro forma balance sheets and income statements for several postbankruptcy years in the reorganization plan prepared for court approval. The numerical precision of the pro forma accounting statements is convenient for research purposes, but projections of future values is uncertain at best, and in bankruptcy cases the financial projections may be strongly biased by political considerations.

From the financial viewpoint the major consideration is usually the redistribution of assets between equity and debt holders, and between the various classes of creditors. Another way of looking at it is that the organizational restructuring emphasizes the left hand, or asset, side of the balance sheet, while the financial restructuring emphasizes the right hand, or liability, side. The Bankruptcy Code provides priorities for

the distribution of assets, but while their application is relatively straightforward when the assets are reduced to cash and the firm liquidated, the adjudication of claims in reorganization is not so clear and much more subject to negotiation. The evaluation of restructuring outcomes for classes of creditors is often simpler than for individual creditors within classes, particularly those holding negotiable assets, such as publicly traded stocks and bonds. Holding periods and the extent of accrued gains or losses may not be homogeneous within a class of creditors, which in turn will affect individual interests and preferences at decision points.

Valuation of the Reorganized Firm

If a firm is reorganized, any evaluation of the outcome must include an estimate of the future value of the reorganized firm. In theory this should be little different than the analysis of any other firm, but there are a number of differences. Overloads of debt, inadequate working capital, and similar problems may be more easily identifiable than some other factors. Revenue and earnings projections may be particularly difficult. The historical bases for such projections are less solid than for other firms. In addition, there is inevitably a bias for overly optimistic projections, since a projection for success is a prerequisite for reorganization. Also, proponents of reorganization may make unrealistic projections for political advantage. On the other

hand, the accounting for assets may be better than normal, since all assets must be reevaluated in the bankruptcy process. For example, book values for accounts receivable and fixed assets are generally more accurate after bankruptcy than before.

Tax Issues

Tax considerations are important and complex in many business situations, but probably none so extreme as in bankruptcy. Much of the complexity of reorganization plans and bankruptcy settlements is directly due to efforts to maximize the tax benefits of all parties concerned. Any unpaid taxes have a relatively high priority claim in bankruptcy, but the claims are usually limited to small amount of payroll, excise, and taxes other than income taxes. Primary concerns are the utilization of tax-loss attributes and the tax treatment of discharged debts by both creditors and debtors. Specific tax considerations are much too complex to treat in this discussion. The bankruptcy disclosure statements, which describe the distribution of assets and settlement of claims, frequently include a section on the tax consequences of the plan, but they do not relieve any parties of their responsibilities for tax computation and payment. The Bankruptcy Reform Act of 1978 and subsequent tax legislation have generally made it easier to preserve tax advantages. The new law has also tended to shift the emphasis from

line-of-business considerations to ownership considerations.

Research Results

Outcome Classification

The discussion of bankruptcy outcomes above has been quite extended, but the research on the outcomes for the firms in the study was limited in scope. The very complexity of the possible outcomes makes research design difficult, and the available data is quite limited. For a few firms, particularly large firms that were successfully reorganized, company records and the business press provide extensive data, but for a majority of the firms, little information on outcomes was available within the limits of the resources available. The section that follows outlines the data that were available and describes some simple analyses that were performed.

At the time that the statistical research data base was closed, 60 of the 73 firms had completed the bankruptcy process, or the process was so near completion that the outcomes were reliably predictable. For each firm that had completed the process, the date of the settlement was known and enough information was available to classify the outcome into one of the four following categories:

1. Successful reorganizations. These were firms which

maintained their corporate identity, and which had postreorganization assets or sales of at least 50% of prebankruptcy levels.

2. Partially successful reorganizations. These were firms which maintained their corporate identity, but which had postreorganization assets or sales of less than 50% of prebankruptcy levels.

3. Mergers or acquisitions. These were firms whose business and organizational structure was continued by another firm after acquisition or merger.

4. Unsuccessful reorganizations and liquidations. These were all the firms which had completed the bankruptcy process and did not fit one of the other categories.

Sufficient information was available to make the classification of firms as successful reorganizations clearcut, but the other classifications required some subjective judgments. Some firms may have maintained a legal corporate identity but were so reduced in size and visibility that it was not possible to distinguish them from liquidations. In some cases, bankrupt firms sold major blocks of assets to other firms, but unless some clear business identity was maintained, they were classified as liquidations. For example, Sambo's Restaurants sold a substantial number of stores to Vicorp Restaurants, but they were not operated as Sambo's, so the outcome was considered a liquidation. Magic Marker sold its name and trademarks to another firm, which took Magic Marker as

its new name, but that also was classified as a liquidation. It is ironic to note that the new Magic Marker subsequently went bankrupt, too.

The classification of outcomes was based on the data taken immediately after the emergence from bankruptcy. A number of firms which were reorganized, both successfully and unsuccessfully under the definitions above, disappeared shortly after reorganization. Some went bankrupt again and were liquidated, and others were merged or acquired by other firms. Firms emerging from bankruptcy are usually in a weakened condition with limited cash resources, weak credit ratings, and low stock prices. Reorganized firms with sound business cores may be attractive targets for acquisitive firms.

Table 9.1 list the bankruptcy outcomes for the firms in the study. The failure pathway for each is also shown. The list of outcomes shown in Table 9.1 was revised subsequent to the statistical testing reported later in this chapter. A number of reorganizations in progress when the statistical analyses were run had been completed prior to the final editing of this table.

Table 9.1

Bankruptcy Outcomes *

	Failure Pathway **
SUCCESSFUL REORGANIZATIONS (12)	
AM International, Inc.	MM
Continental Airlines	LC
Data Access Systems	LC
Leisure Dynamics	MM
Lionel Corporation	FMS
Phoenix Steel Corporation	FMS
Poloron Products Inc.	MM
Revere Copper and Brass Inc.	FMS
Robintech Inc.	MM
Salant Corporation	MM
Storage Technology Corp.	LC
Wickes Companies Inc.	LC
UNSUCCESSFUL REORGANIZATIONS (28)	
Amfesco Industries	FMS
Anglo Energy	LC
Argo Petroleum	LC
Berry Industries Corp.	FMS
Bobbie Brooks	MM
Braniff International Airways	LC
CS Group	LC
Charter Company	LC
Continental Steel Co.	MM
Cook United	MD
Eastmet	MD
Flame Industries Inc.	FMS
Garland Corporation	MD
Gilman Services	LC
K-Tel International Inc.	MD
Marion Corporation	LC
McLouth Steel	LC
Mego International Inc	MM
Mesta Machine Co.	MM
Mobile Homes Industries	MD
Morton Shoe Cos.	MM
Nucorp Energy	LC
Pathcom Inc.	MM
Richton International Corp.	MD
Rusco Industries Inc.	MM
Smith International	MD
Tacoma Boatbuilding Inc.	MD
White Motor Corporation	MM

Table 9.1 (cont)

Bankruptcy Outcomes *

MERGED OR ACQUIRED (9)	
Altec Corporation	MD
Commodore	FMS
KDT Industries Inc.	LC
National Shoes Inc.	MM
Saxon Industries	LC
Solomon, Sam, Inc.	FMS
Steelmet Inc.	FMS
Stevcoknit Inc.	MM
Towle Manufacturing Co.	LC
LIQUIDATIONS (16)	
Advent Corporation	LC
Auto Train Corp	MD
Barclays Industries Inc.	MM
Berven Carpet Corp.	MD
Branch Industries	MD
Capitol Air	LC
Cooper Jarrett	MD
Crompton Company, Inc.	MD
Glover Inc.	MM
Good (L. S.) Co.	MM
Lynnwear Corporation	MM
Magic Marker Corp.	MD
Sambo's Restaurants	LC
Tobin Packing Co., Inc.	MM
Transcontinental Energy Corp.	MD
Upson Company	
STILL IN REORGANIZATION (8)	
Beker Industries	MD
Global Marine	FMS
LTV Corporation	MD
MGF Oil	LC
Manville Corporation	LC
Robins, (A.H.), Company	LC
UNR Industries Inc.	LC
Wheeling-Pittsburgh Steel Co.	MD

* This list was revised subsequent to the statistical analyses reported on pages 255-259.
** Failure Pathways: MD = Market Deterioration, MM = Market Maladaptation, FMS = Fight for Market Share, LC = Loss of Control.

Stock Trading for Bankrupt Firms

Given that maintenance of corporate identity and a substantial financial base are key indicators of successful reorganization, an external validation of that achievement was seen as desirable. The major stock exchanges have a set of rather stringent standards for firms listing their stocks, so postbankruptcy exchange listing was selected as one indicator of successful reorganization.

The firms in the study were selected on the basis that they were publicly traded prior to bankruptcy. During and following bankruptcy there were many changes in the exchange listings for the firms, including those which were able to successfully reorganize. For purposes of analysis the stock exchange information was divided into five categories defined as follows.

1. Firms traded on the New York Stock Exchange.
2. Firms traded on the American Stock Exchange.
3. Firms not traded on the New York or American Stock Exchanges, but with trading information widely reported in financial journals and reference works. This category includes firms included in the daily over-the-counter section of the Wall Street Journal, firms trading on the Chicago Stock Exchange, and firms whose trading is reported in Daily Stock Prices.
4. Firms identified as having public stock in circulation

by such sources as Standard and Poor's Corporate Register, but not included in any of the preceding categories.

5. Firms with no publicly traded stock. This category includes firms which were liquidated, acquired by other firms, or taken private in the reorganization process.

While stock exchanges listings are good indicators of a firm's financial strength, they provide no direct information about changes in ownership or other financial restructuring. Many bankruptcy reorganizations result in the cancellation of all old stock and the issuance of new stock. Holders of the old stock may receive little or none of the new stock; most of the new stock may be distributed to creditors in lieu of cash payments. A number of reorganizations were dependent on major capital contributions by new investors who gained major ownership stakes and control, and, in the process, they left only relatively small amounts of public ownership of questionable value. However, if any stock remained in the public domain, the firm was classified on the basis of that stock. For example, the reorganized Braniff Airways is totally controlled and primarily owned by the Pritzker family, but there is a small amount of common stock which is publicly traded over-the-counter. In the case of Continental Airlines, Texas Air Corp. owned over 80% of Continental prior to and through the bankruptcy process, and after reorganization moved to 100% ownership, but Continental is classified in Category 2, because its stock was traded on the American Stock Exchange

until after the reorganization was consummated.

A summary of the exchange data is given in Table 9.2, and a complete listing for all firms is included in the appendices. Stock trading for failing firms during and after bankruptcy was determined by quantity and quality of the stock. Stock can be delisted either voluntarily by the firm, or it may be delisted by the exchange, if it fails to continue to meet the exchange's requirements, such as the market value of stock and the number of shareholders (New York Stock Exchange, 1986). In addition to the quantitative standards, exchanges have other criteria for delisting which may be applied.

Table 9.2

Summary of Stock Trading for Bankrupt Firms

Exchange	Before Bankruptcy	After*
1. New York Stock Exchange	24	16
2. American Stock Exchange	23	5
3. Over-the-Counter (published)	26	13
4. Other (nonpublished)		11
5. None		28

*Includes firms still in the reorganization process

Bankruptcy is a basis for delisting, but the delisting is

neither automatic nor universal. The policy of the major exchanges on the delisting of stocks of bankrupt firms has been evolving. As late as 1982, the NYSE and ASE delisted bankrupt firms immediately on declaration of bankruptcy, or before, if the firms had failed to meet the exchange's financial standards. For example, Wickes declared bankruptcy on April 24, 1982, and the NYSE delisted the stock on May 9, 1982. More recently, several bankrupt firms' stocks have traded without interruption on the NYSE, including Storage Technology, Wheeling-Pittsburgh Steel, LTV Corporation, and A. H Robins. Mobile Homes Industries, a relatively small firm, continued to trade on the NYSE following its bankruptcy in 1984 but was delisted after reorganization. Manville Corporation, which declared bankruptcy in 1982, was one of the first bankrupt firms which continued to trade on the NYSE without interruption; but that bankruptcy was unique in that there was no immediate threat to ordinary business creditors.

Outcome Prediction Hypotheses

After observing the bankruptcy outcomes and classifying them into a manageable number of categories, the next step was to look for ways of predicting the outcomes on the basis of prebankruptcy information. Prior to initiating the research, the following hypotheses about bankruptcy outcomes were developed:

H1. Successful reorganization will be positively correlated

with the rate of decline of the firm in the decline phase.

This hypothesis was based in part on the hypothesis in Chapter 6 that firms in growing industries would decline more rapidly than those in declining industries. Growing industries would normally appear to provide a better environment for reorganization than declining industries. For example, in declining industries there would be less motivation to preserve production capacity. Also, less erosion of assets would be expected in firms which had declined rapidly as compared to those that had declined slowly.

H2. Successful reorganization will be positively correlated with the mean book value of equity for the two years immediately preceding the filing.

Obviously the greater the assets the firm has, the more likely it is to be successfully reorganized. Larger firms would be more likely to have a mix of assets, some of which could be sold and others used as a core for the reorganized firm. The choice of using the mean value over two years was made to reduce the effect of rapid prebankruptcy restructuring and disposition of unprofitable assets.

H3. Failing firms will be able to reorganize successfully only if the firm can reestablish operations at a substantial level immediately or within three months of the bankruptcy filing date.

This hypothesis was based on the belief that if the firm's

businesses were of significant future utility, then there would be strong motivation to reorganize. Even if the assets were valuable, the erosion of their value standing unused and the startup costs of remobilizing them would make reorganization more difficult.

H4. Failing firms will be able to reorganize successfully only if the firm has a new top management team.

If firm decisions are a critical factor in business success, then business failure is at least an indicator of faulty management, which is not likely to perform significantly better in reorganization. Perhaps more important than actual performance, creditors and other external forces will tend to give higher credibility to new managers than old managers, and consequently will be more likely to grant the concessions necessary for reorganization. This has been one of the most consistent themes of the turnaround literature, and bankruptcy reorganizations differ from other turnarounds only in the extent to which the firms have declined before the turnarounds are initiated. In some cases, bankruptcy may have been the result of a failed turnaround, which makes it even more likely that new leadership will be sought.

Results of Hypothesis Testing

In order to test the hypotheses and to relate the outcomes to the failure pathways, the outcome results were

crosstabulated with the pathways as shown in Figure 9.2

Figure 9.2

Bankruptcy Outcomes and Failure Pathway Relationships

FIRM SALES	INDUSTRY SALES: Declining	INDUSTRY SALES: Growing	Totals
Declining	Path 1 Outcomes 1. 1 2. 4 3. 1 4. 7 5. 6	Path 2 Outcomes 1. 6 2. 6 3. 2 4. 6 5. 1	1. 7 2. 10 3. 3 4. 13 5. 7
Growing	Path 3 Outcomes 1. 3 2. 2 3. 3 4. 0 5. 2	Path 4 Outcomes 1. 5 2. 9 3. 2 4. 3 5. 4	1. 8 2. 11 3. 5 4. 3 5. 6
Totals	1. 4 2. 6 3. 4 4. 7 5. 8	1. 11 2. 15 3. 4 4. 9 5. 5	1. 15 2. 21 3. 8 4. 16 5. 13

(Paths: 1 = Market Deterioration, 2 = Market Maladaptation,
3 = Fight for Market Share, 4 = Loss of Control
Outcomes: 1 = Success, 2 = Partial success, 3 = Merger,
4 = Liquidation, 5 = In Process)

The large number of alternative outcome cells relative to the number of cases precluded statistical analysis, but the data in each of the cells in Figure 9.2 appears to be consistent with expectations. Reorganizations, both successful and partially successful, in growing industries outnumbered those in declining industries. This suggests that firms in growing industries had core businesses worth preserving. The relatively high proportion of reorganizations still in progress

for declining firms in declining industries points to the difficulty of settling accounts when the assets are tied up in unattractive industries, especially when the firms are large. These firms declined slowly and are reorganizing slowly. As in most other analyses in this study, firm effects appeared to outweigh industry effects. Firms with declining sales tended to be liquidated, but firms with growing sales in declining industries had a good reorganization record.

Moving to the statistical hypothesis testing, for Hypotheses 1 and 2 about reorganization outcomes, the data were consistent with the hypotheses, but not statistically significant. A number of variables were tested as predictors of successful reorganizations, including rate of decline, book value prior to bankruptcy, z-scores, and size using stepwise discriminant analysis. The only variables with a significant univariate F value were size related variables. A discriminant prediction model using the natural log of total assets in the year before bankruptcy as the only predictor correctly predicted 76.9% of the successful reorganizations and 77.1% of the unsuccessful reorganizations. Of the 13 reorganizations in process, the model predicts ten successful reorganizations, including LTV Corporation and Wheeling-Pittsburgh Steel Company. This would be a very high proportion of successes, but the firms tend to be very large including LTV, Wheeling-Pittsburgh, and Global Marine.

It is important to note that size was a direct predictor of reorganizational outcomes and was not mediated through performance variables. Size was not significantly correlated with performance ratios either for the bankrupt sample or in the independent study reported in Chapter 4. Looking at the individual cases, three explanations of the relative success of large firms in reorganizing come forward. The very large firms have a broader array of assets, some of which may be productive and valuable as a business core for a reorganized firm. Also, the very size of the assets may make it more difficult to find financially capable buyers, and antitrust considerations may inhibit mergers. Away from financial considerations, large firms would be expected to have a larger and more diverse group of stakeholders who would be in a position to exercise political influence to preserve the firm. This would follow from the Chrysler situation in which a broad package of subsidies was put together by unions, suppliers, distributors, and governments to insure Chrysler's survival. A major argument in the Chrysler case, and later in the Continental Illinois Bank case, was that the firm was too large to let it die.

Of the firms in the sample with assets in excess of a billion dollars, only two, Braniff Airways and Charter Company, were classified as unsuccessful reorganizations. Both survived, but were greatly reduced in size. Braniff delayed declaring bankruptcy until it was in desperate financial

condition, and suspended all operations throughout the reorganization period. The Braniff bankruptcy was one of the earliest large bankruptcies, and its experience may have served as a warning to Continental Airlines and other large firms that went bankrupt later in the period. The Charter Company was a relatively loose federation of unrelated activities, many of them in financial services, which had been acquired in a recent conglomerate expansion. As a result, the divestment of large units was easily accomplished with little loss to anyone.

Statistical testing for the last two hypotheses would have required more detailed operational data than were available for most of the cases. As indicated in earlier discussions, many of the firms were relatively small with little or no available narrative data. The hypotheses appeared to be consistent with the available case data, which were heavily biased towards large firms and successful reorganizations. Braniff was one of the few large firms which suspended operations on declaring bankruptcy.

Testing H4, which posits that new leadership will be required for successful reorganization, would require a flexible definition of <u>new</u> leadership. The essential point is that the managers who controlled the firm during decline are unlikely to be able to manage a successful reorganization. In a number of cases, these leaders were replaced just prior to the filing for bankruptcy, and the decision to elect the

bankruptcy option was the first decisive action by the new leadership. In the case of Braniff, Harold Putnam made the bankruptcy decision almost immediately on his appointment, but he did not survive the reorganization, In the Wickes case, Sandy Sigoloff took the bankruptcy action, served as CEO throughout the reorganization, and has continued in that capacity ever since. In the Continental Airlines case, Frank Lorenzo carefully orchestrated first the takeover of Continental, then the merger of failing Texas International Airlines into Continental, and then the bankruptcy of the combined airlines. All this was accomplished without bankrupting or financially jeopardizing the parent holding company, Texas Air Corporation.

Discussion of Results

Much of the traditional thinking about bankruptcy outcomes has been oversimplified by considering only the simple dichotomy of liquidation vs. reorganization. The academic finance literature is largely consistent with this view in its emphasis on choosing between the alternatives on the basis of the relative values of the firm's liquidation value and its value as a going concern (Bulow and Shoven, 1978; and others). This view fits the situation reasonably well for small firms with a single business, but is grossly inadequate for large firms with multiple business units.

For large multiple-business firms, some units may be reorganized and others liquidated or sold, which means that there is a variety of possible outcomes. Given that there are a number of alternative outcome possibilities, the more interesting question is what should the firm in bankruptcy do with each business unit. The two broad criteria that should be used to make that judgment are the relative business strength of the unit and the financial resources of the firm which can be allocated to that business. The matrix in Figure 9.3 displays these considerations and some choices.

Figure 9.3

Bankruptcy Business Unit Alternatives

		Business Unit Strength	
		Strong	Weak
Available Financial Resources	Adequate	Continue/ Grow	Turnaround/ Liquidate
	Inadequate	Divest	Liquidate

The matrix suggests appropriate decisions on a unit-by-unit basis, but for multiple-unit firms, the overall task is to select the best portfolio of business units. On the business-strength dimension, synergies between business units must be considered. On the financial-resources dimension, the critical issue is the allocation of a relatively homogeneous

resource; funds allocated to one unit are not available for any other unit or activity.

From a business strategy viewpoint the matrix is essentially an "instant BCG" portfolio matrix. Stars and dogs are still stars and dogs. Cash cows are now to be slaughtered, not milked. Question marks are turnaround candidates. From a finance viewpoint, the question is a classic problem of capital budgeting, made more difficult by severe budget scarcity. The real problem is to select a portfolio business for the restructured firm. There can be no general rule for defining the optimum portfolio, but a review of bankruptcy reorganizations suggest two quite different strategies for asset pruning. One strategy is to prune weak business units as necessary to create a small portfolio of adequately financed strong businesses. An alternative strategy is to divest units with good market value and focus on a portfolio of risky businesses with potential for profitable turnover. In either case, the decision is not purely managerial, but rather the subject of negotiations between all claimants to the bankrupt firm's assets. Strong risk-averse creditors may force the divestment of strong business units, leaving the risky portfolio the only option open to owners and managers. In other cases, the critical question may come down to the choice between a smaller, safer portfolio or a larger, riskier one. Obviously combination portfolio strategies are possible and may be wise.

The model can also serve as an explanation of the observation that most small bankrupt firms were liquidated. The minimum requirement for a reorganization that perpetuates the firm is one relatively strong business with adequate financial resources. A small firm with a single business unit would not be bankrupt, if it met those requirements. A large firm with multiple business units is much more likely to have at least one viable business and the financial resources to support that unit.

It is possible for firms to reorganize as nothing more than corporate shells. That is, they retain their identity, but without any surviving core business. The most common motivation for this kind of reorganization is the preservation of valuable tax-loss carryforwards, but corporate shells may have some other valuable assets, such as name recognition. Some of the firms which are classified here as unsuccessful reorganizations have survived and turned their attention to new businesses. White Motor Company was reorganized as Northeast Ohio Axle Company, which has not only survived, but under its new name of NEOAX has become an aggressive growth firm.

Other reorganizations were used to reverse bad business decisions. Revere used bankruptcy as a mechanism for divesting most of its aluminum business, a diversification that had not worked out. Charter Company used bankruptcy as a mechanism for

unbundling a recently assembled conglomerate that had failed to achieve its objectives. In summary, bankruptcy can be a tool for achieving a variety of outcomes.

The portfolio approach represents the perspective of the management of the bankrupt firm, which emphasizes the legal and financial aspects of reorganization. However, as indicated above, there may be business continuity without formal organizational continuity. A division, subsidiary, or other business unit may be divested, but the ownership change may be relatively unimportant to many stakeholders, such as employees, customers, and suppliers. The value of the unit may be so great for some stakeholder group that it will support the continuation of the business by supplying financial support. One example would be an employee buyout of a business unit, perhaps supported by other local stakeholders. Finding and capitalizing on such interest groups may be an important key to value preservation in the bankruptcy process.

Chapter Summary

Bankruptcy outcomes can be defined in legal, financial, and organizational terms. The legal definitions of liquidation and reorganization are excessively simplistic. Reorganized firms may emerge from bankruptcy as viable organizations with little or no loss in size, or they may emerge as legal entities with few assets and no viable business. Bankrupt firms may be

legally liquidated, with the organization transferred essentially intact to a new owner. In any case, outcomes are as much a function of human factors as financial and legal factors, because bankruptcy is essentially a conflict resolution mechanism.

Of the 73 firms in the research sample, 15 were successfully reorganized, 21 were reorganized with major reductions in size, 8 were acquired by other firms, 16 were liquidated, and 13 were still in bankruptcy at the end of the study. All 73 firms had their stock traded on major exchanges prior to bankruptcy, but only 34 were traded on those exchanges after bankruptcy.

Of the number of variables tested as predictors of successful bankruptcy, only prebankruptcy size was useful. Three possible reasons for the size effect are that large firms are more likely to have some productive assets, that liquidation of large firms may be more difficult, and that a more diverse set of stakeholders makes political compromise settlements more likely. Firms that filed for bankruptcy voluntarily relatively early in their decline appeared to have a better chance of reorganizing than firms which delayed bankruptcy until forced into it by their creditors.

Chapter 10

IMPLICATIONS FOR THEORY AND OTHER STREAMS OF RESEARCH

Chapter Introduction

Previous chapters in this dissertation have been empirically oriented, with emphasis on research designs, data, and experimental results. The purpose of this chapter is to relate the empirical findings to several important research streams, with emphasis on the contributions to theory development. The two major research streams which are most relevant for this study are the strategic management work on turnarounds and declining industries, and the organizational behavior work on organizational decline and life cycles. No attempt was made in this study to directly capture managerial thinking, but the observed behavior of the failing firms can serve as an indicator of managerial choices. For example, work in cognitive psychology on escalating commitment and prospect theory may help explain some of the observed behavior of the failing firms.

Corporate Turnarounds

Bankruptcy and business failure have received little direct attention in the strategic management field, but there are two related areas which have been studied: turnarounds and

declining businesses. Obviously a failure can be seen as an unsuccessful turnaround, and the possibility is recognized in the turnaround literature, but the major emphasis has been on factors leading to successful turnarounds. For example, Hambrick & Schecter (1983), after describing a number of successful turnaround strategies, note that they found no consistent pattern of strategy among unsuccessful turnarounds. Failures were excluded from Hambrick & Schecter's study, since their sample was limited to firms which had suffered two years of decline and either turned around in the two subsequent years or failed to do so. Any firm that failed, or otherwise was dropped from the data base, was excluded from the study. Schendel & Patton (1976) and Schendel, Patton, & Riggs (1976) similarly excluded firms that failed to survive.

The most useful contribution of the turnaround literature to the study of business failure and bankruptcy is the identification and classification of the roots of the decline that creates the need for a turnaround. In his review of the turnaround literature, Hambrick (1985) lists three major sources of decline: maladaptation, poor controls, and excessive risk taking. He also makes a distinction between mild and grave situations, somewhat similar to Zammuto & Cameron's (1985) distinction between continuous and discontinuous change. Hambrick's maladaptation category is suggestive of Zammuto & Cameron's changing niche shape category, but neither the poor controls nor excessive risk taking categories have any

necessary connection to environmental change. In both the maladaptation and excessive risk categories, Hambrick prescribes a revenue push, if the severity of the situation is mild, and major retrenchment, if the situation is grave. Poor control declines call for cost cutting. The Hambrick prescriptions flow rather directly from Hofer's (1980) strategic and operating turnaround strategies. Hofer saw operating turnarounds as doing the same things better, and strategic turnarounds as doing different things. Poor control declines call for operating turnarounds, and maladaptation and excessive risk declines call for strategic turnarounds. Strategic turnarounds can be subdivided into a number of subclasses. Maladaptation may require changes in product-market strategies, while excessive risk declines, and many severe declines of whatever source, may require strategic reallocation of resources, including asset sales or divestment of entire business units.

Much of the turnaround literature, academic and practitioner oriented, consists of a rehash of standard strategic management principles dressed up for the turnaround situation. Improved environmental analysis, evaluation of a firm's strengths and weaknesses, improved decision making and control, and human resource management under adversity are the staples. The most useful example of this approach is Bibeault's 1982 book, Corporate Turnaround.

Research on specific environmental and structural influences on decline and turnaround has been limited. Ramanujam (1984) explored a number of variables and found few that were significant on a univariate basis, but he was able to develop a significant classification model for successful and unsuccessful turnarounds using multivariate discriminant analysis. Of all the variables he investigated, size and size-related variables dominate. Firms with successful turnarounds grew more rapidly than unsuccessful turnarounds in the predecline and postdecline phases and less rapidly in the decline phase. The only significant environmental variable was industry growth in the postdecline, which parallels a finding by Hambrick and Schecter (1983).

Given the reasonable expectation that firm decline and failure will be closely related to industry decline, Harrigan's (1979) work on strategies for declining industries should be relevant. She identified three primary reasons for industry decline: technological obsolescence, demographic or sociological changes, and changing fashion. Her strategy prescriptions are based on applications of the widely used industry attractiveness-competitive strengths matrix. The prescriptions range from increased investment to immediate exit. In a later paper, Harrigan (1982) discusses some of the problems of exit decisions in mature or declining industries. One of the major difficulties in applying Harrigan's work, and also much of the turnaround literature, is that she used a

product-market level of analysis, while this study had firms as its level of analysis. Of the declining industry cases she studied in detail, only two firms failed or disappeared, and both were joint ventures organized to produce a single product in a declining industry. In Harrigan's 1982 paper on product/market exit decisions, only cases in which the firms survived the exit were included.

The results of this study tend to support the previous findings, but they also suggest that the total picture is even more complex than that provided by existing research literature. Most of the failing firms in this research would have matched the previous definitions of decline and were in need of a turnaround, but others would not. For some of the firms the failures can better be categorized as catastrophes than as declines. For others--for example, the product liability cases--the losses were projected, not realized.

Although the academic strategy literature defines decline on the basis of unsatisfactory profitability, the behavior of the failing firms suggests that the managers were more responsive to sales performance than profitability. The data shows that failing firms with declining sales held their assets steady or reduced them, on an inflation-adjusted basis. The firms with growing sales increased their asset bases much more rapidly than the comparison nonfailing firms, which were also growing on an inflation-adjusted basis.

The evidence appears to suggest that managers were not very responsive to their environments, specifically industry growth in this study. Industry effects were consistently weaker than firm effects. Particularly surprising on this point was the observation that among all firms with declining sales, firms in growing industries actually shrank their assets, while firms in declining industries grew at just about the rate of inflation. For firms with growing sales, industry growth appeared to be irrelevant.

Although the statistical data and the bulk of the case data support the picture of firms failing in their attempts to grow out of their declines, the clarity of the picture is reduced by some cases in which the pattern was one of success-driven growth followed by a sharp decline in profitability. To the extent that the failing firms show little evidence of asset pruning and cost reduction, the study appears to validate the turnaround prescriptions. In comparison with the previous turnaround studies, this study gives a more fatalistic impression of turnarounds and failures: firms fail under a wide variety of circumstances pursuing a variety of strategies. Another less fatalistic view is that success and failure factors are more contingent and less generalizable than the turnaround literature suggests.

If bankruptcies are seen as failed turnarounds,

reorganizations can be seen as second opportunities for turnarounds. Many of the same issues and strategy choices occur in both, but under altered conditions. In reorganizations, firms have the advantage of temporary protection from creditors and other claimants, but the freedom of managers to choose among strategy alternatives is substantially limited. While evidence from the turnaround literature and from the decline phase of this study suggests that major asset pruning will be strongly resisted whenever possible, in bankruptcy asset reduction is nearly inevitable. Among the 60 firms which had completed the reorganization process by the conclusion of this study, only 15 emerged from reorganization with as much as 50% of their prebankruptcy assets. There are a number of possible explanations of this shift in strategy, some related to reduction in strategic alternatives and other to managerial choice. One consideration is the shift of decision-making power from operations managers to investors and creditors. Another explanation may lie in organizational learning. Asset pruning became more acceptable once the firms learned that their growth strategies did not work. It should not be assumed that growth strategies were solely determined by operational managers. For this sample of firms, debt growth was even greater than asset growth, which means that creditors must have at least acquiesced to the growth strategies.

The organizational learning argument focuses on collective

judgments, but the role of individual decision making should not be neglected. Major changes in strategy may be possible only with the replacement of managers with commitments to old strategies. The necessity of replacing the managers for successful turnarounds is one of the most common themes of the turnaround literature. Information on management turnover was not collected systematically in this study, but there were repeated reports of managerial turnover during reorganizations or just prior to the bankruptcy filings. Change in management leadership is not necessarily a requirement for organizational learning or change. Change in leadership may meet the need for visible symbolic change or improved credibility, even when the old leadership is willing and able to implement new strategies. Also, reorganizations are much more difficult than turnarounds, and they may require new skills. The capacity to manage the legal and bureaucratic demands of the bankruptcy process may be more important than running the business, not to mention the necessity of doing both at the same time.

Declining Industries

Previous work, particularly that of Harrigan (1979, 1982) on declining industries was influential in the development of this study, but the results were less closely related than expected. Fewer of the failing firms were in declining industries, 29 of 73, than in growing industries, and in general industry effects were smaller than firm effects. The

low proportion of large diversified firms in the sample of failing firms would appear to suggest that these firms have the opportunities and resources to deal with unprofitable units in declining industries without destroying the firm as a whole.

Within the declining industry group there were significant differences between firms with growing sales and those with declining sales. The ten firms in declining industries which had growing sales pursued aggressive growth strategies increasing their assets and debt at a faster rate than the sample as a whole or the sample of nonfailing firms. On the other hand, the firms with declining sales grew at a slower than average pace compared to either sample; their asset growth was very close to zero on an inflation-adjusted basis. Debt grew about twice as fast, but much of the debt growth was driven by income deficits.

The two groups of firms in declining industries exhibited significant differences in the post bankruptcy period. Firms with declining sales had great difficulty in reorganizing successfully. Of 19 firms with declining sales, none was successfully reorganized, eight survived with major decreases in size, one merged, seven were liquidated, and three were still in bankruptcy, which is consistent with Harrigan's (1982) observations about the lack of exit opportunities in mature industries. However, of the ten firms with growing sales, none was liquidated and only one was still in bankruptcy at the end

of the study period. Three of the ten were taken over by other firms in the reorganization process. These results indicate that successful fight-for-market share strategies are valued by investors.

Organizational Decline and Life Cycles

Another source of understanding for bankruptcy and failure can be found in the stream of research and writing on organizational decline, with Whetten (1987) as a leading reference. The organizational decline research stream has its roots in the life cycle paradigm. According to the paradigm, organizations are like living organisms which are born, grow, mature, decline, and eventually die in a complex external environment which can be either hostile or friendly. Within this general context, numerous life cycle models have been developed. Unfortunately, from the standpoint of this research, the decline and death stages have received minimum attention, and the primary focus of the attention they have received is on the management of decline.

Not only has the work on decline been limited in concept and scope, but the work that has been done is flawed in a number of ways. Problems in the definition of decline are compounded by confusion over environmental decline and organizational decline. Most of the work on decline has been directed toward not-for-profit organizations, such as

hospitals, universities, and social service agencies. In these organizations, definition of decline as a decrease in size or budget may be appropriate, but it does not cover a business that is growing in size, but declining in profits.

One approach to the relationship between decline in the environment and the organization is that of Zammuto & Cameron (1985). They classify environmental decline into four categories based on environmental niche change and the continuity of the change. Continuous decrease in niche size is called erosion; discontinuous decrease is called contraction; continuous change in shape is called dissolution; and discontinuous change in shape is called collapse. Zammuto & Cameron then proceed to discuss the relationship between organizational types and their abilities to compete and survive under the four categories of environmental decline. When niches are decreasing in size, organizations which stress efficiency in narrow domains will be most successful. When niches are slowly changing in shape, organizations which stress efficiency over broad domains will be most successful. When niches collapse suddenly, entrepreneurial first-mover organizations will be most successful. Zammuto & Cameron conclude by suggesting some appropriate structural and strategic responses to the niche changes. For niche erosion they prescribe domain offense, emphasizing an increase in market share. For niche contraction they prescribe domain defense, emphasizing externally oriented strategies to protect

the domain. For shifting niche shapes, they prescribe domain creation, emphasizing the search for new opportunities. Zammuto & Cameron's analysis is thorough and sophisticated, but practical applications may be difficult. Strategic responses to environmental change can be expected to encounter all the difficulties outlined by Ansoff (1984). These include failure to detect early warnings, lack of consensus on diagnoses and prescriptions, and lack of resources to carry out desired strategies.

The complexity of decline is further demonstrated by the divergent views that have emerged from the decline studies. Starbuck & Hedberg (1977) and Nystrom and Starbuck (1984) have stressed the sudden collapse of very successful organizations, the "success breeds failure" syndrome. Whetten (1980) has stressed "decline as stagnation": slow decline, often unrecognized until it is too late to take effective action.

The results of this study clearly demonstrate that organizational decline and failure are more complex than would be expected from reading the existing decline literature. Organizations have multiple attributes, and the rise or decline of any one attribute may not be closely linked to other attributes. Business firms may be somewhat unique in their emphasis on the single attribute of profitability. Other attributes may be highly valued by some stakeholders, but no other value can be sustained over time, unless the firm is

profitable.

The major contribution this study makes is its extension of previous work, largely based on research on not-for-profit organizations, to business decline and failure. The shift away from size and growth as the key test of decline to profitability is not the only difference between business decline and other organizational decline. The very institution of bankruptcy makes business unique. The bankruptcy system makes explicit the expectation that some organizations will fail and that some will be resurrected. Furthermore, it provides a uniform system for coping with the failure. With no external agencies to signal organizational death, and no accepted mechanisms which provide hope for rebirth, it is not surprising that so many not-for-profit organizations hang on to their existence beyond any hope of recovery.

The results of the study do suggest that the wide variety of decline typologies and environments previously reported may still be too small. Both the sudden collapses described by Starbuck and the slow stagnation declines of Whetten were observed. Failures were observed in environments in which the firm's niche was decreasing in size, declining industries in this study, as suggested by Zammuto & Cameron. However, the failures of growing firms in growing industries do not seem to fit any of Zammuto & Cameron's categories. They may be examples of Starbuck's "success breeds failure" typology. The

predominance of single businesses in the sample may provide support for Zammuto & Cameron's proposition that specialist strategies are not effective in changing environments.

Probably the largest body of work relating to decline has dealt with the management of decline, including problem recognition, managerial selection and motivation, and the management of retrenchment. This study has largely been limited to issues that could be addressed with financial and other objective data. Clearly there needs to be an integration of the financial and the behavioral approaches. In addition, for business decline and failure the firm-level analysis emphasizing financial data needs to be integrated with operational and functional strategies, such as product lines, marketing strategies, and technology utilization. Finally, it would be useful to consider bankruptcy as a device for managing death as a follow-up to Sutton's (1983) work on the management of death.

Escalating Commitment and Prospect Theory

One of the most common questions following a business failure is: why did the firm continue a losing endeavor for so long? The observed behavior frequently appears to be irrational to observers and contrary to traditional utility theory. Two major streams of research are related to this question. One is escalating commitment (Staw, 1981, 1987;

Teger, 1980), which proposes that decision makers are most likely to allocate additional resources to a project when the prior investment has been unprofitable and the decision maker feels personally responsible for the prior decision. These authors suggest that the continued allocation is driven by the need for self-justification. The second is prospect theory (Kahneman & Tversky, 1979), which proposes that decision makers are risk-averse with regard to gains, but risk-seeking with regard to losses. The difference is driven by the frame of reference of the decision maker. In gain situations, the decision maker tends to frame the decision in terms of current wealth and possible gains. In loss situations, the decision maker tends to frame the decision in terms of cumulative losses, or some initial state of wealth, and possible losses.

Escalating commitment and prospect theories were developed independently, but subsequently there have been attempts to reconcile and integrate the theories. Whyte (1986) suggests that escalating commitment provides a specific explanation for behavior that can better be explained in terms of the broader concept of prospect theory and framing of decisions. Bowen (1987) points to the need to distinguish between the "decision errors" of escalating commitment and "decision dilemmas" in which there is insufficient information to make correct decisions. DeMeza & Dickinson (1984) raise an issue which may be particularly relevant for corporate bankruptcy. They suggest that transaction cost considerations may lead decision

makers to continue a course of action that would be costly to reverse. They couch their argument in terms of durable and nondurables, but it would appear to be applicable to fixed assets and operating expenses. Changing decisions about fixed assets would have higher transaction costs than decisions about operating costs.

Most of the work on prospect theory and escalating commitment has focused on individual behavior, although Bowen points out the importance of interpersonal and organizational factors in what may appear to be cases of escalating commitment. In the case of organizational decision making in general, and bankruptcy in particular, the expected outcomes for various stakeholders may not be the same. In some cases, the differences may depend on the way that the decision is framed. In other cases, the differences may be substantial, no matter how the decision is framed. As Gordon (1971) from the finance literature has pointed out, if the liquidation value of the firm is less than the creditors' claims, the expected value of liquidation for stockholders is zero. Therefore, in that situation stockholders should prefer any survival alternative, regardless of its risk.

Williamson (1963) recognized that managers and owners may have divergent interests. The same observation is the basis of agency theory (Jensen & Meckling, 1976), which points to divergent interests of managers and owners in a number of firm

decisions and resource allocation. The differences may be even more marked in the case of failing firms. Amihud & Lev (1981) propose that managers seek conglomerate mergers in order to diversify their "employment risk," even if the mergers may provide stockholders no more protection than a portfolio diversification, which could be achieved at lower cost, and bankruptcy is the ultimate employment risk. There is evidence (Laughhuunn, Payne, & Crum, 1980) that managerial risk preferences are affected by the potential magnitude of the loss. They found that managers shifted from risk seeking to risk averse when losses shifted from nonruinous to ruinous. It is possible that managers' perceptions of their risk may vary with the degree of decline of the firm. As long as the apparent alternatives to the manager are continued employment in the surviving firm and loss of employment in bankruptcy, one risk/payoff calculation may be dominant. However, when loss of the current employment is certain, then the manager's risk aversion may reflect a concern for avoiding the reputation of being an irrational risk-taker when he seeks future employment. Another problem for managers in the bankruptcy situation is the identification of the holder of the payoffs. In the bankruptcy process the locus of control may pass from old owners to creditors or new owners.

Research Results

The results of this research are consistent with the prior

work described above, but they make little contribution to the unraveling of the complex relationships between escalating commitment and prospect theory. This is to be expected, since the differences between escalating commitment and prospect theory are rooted in human thought and decision-making processes. The purpose of this study was to explore the financial and objective characteristics of failing firms using publicly available extra-firm data.

The research results provide a clear support for the proposition that organizations, like individuals, are risk-seeking in loss situations. On average, the bankrupt firms were weaker on most measures than the nonbankrupt firms six years before bankruptcy, yet they consistently pursued higher-risk strategies. The bankrupt firms grew by 95% in total assets in the five years prior to bankruptcy, while the comparison firms grew by 78%. The total debt, current liabilities plus long-term debt, of the bankrupt firms increased by 205%, compared to 88% for nonfailing firms. There was some support for DeMeza & Dickinson's (1984) thesis that because of transaction cost differences, decision makers will resist changes in durable (fixed asset) spending until the loss differences overwhelm the transaction costs. The bankrupt firms' fixed assets grew by 96.8% and their current assets by 41.8% over the five-year period prior to bankruptcy. In the final year before bankruptcy, both fixed and current assets declined, but the fixed assets declined more, suggesting that a

transaction cost barrier may have been overcome. This unwillingness or inability to reduce fixed assets may be a major contributing factor to the commonly observed cash flow problems of declining firms.

No quantitative evidence was obtained, but the anecdotal evidence supports the propositions about the divergence of interests and risk preferences among stakeholders and individuals. In numerous cases, for example Braniff and Wickes, failing firms resorted to bankruptcy only after managers in the decline period were replaced. Although, as far as is known, all the bankruptcies were voluntary--i.e., they were initiated by management--it is known that many were driven by creditors. In at least one case, Braniff, unsecured creditors supported high-risk strategies that were detrimental to secured creditors, a point established in legal proceedings brought by bondholders against the banks during the reorganization process.

Although there is no direct evidence to the point, it seems reasonable to surmise that stockholders and the boards that represented them may have supported managers in their resistance to bankruptcy, as proposed by Gordon (1971). It appears clear that in many cases, firm value losses would have been reduced by an earlier declaration of bankruptcy. What is not clear, without access to the minds of the decision makers, is why they chose to delay taking value-preserving actions.

The list of possible explanations is long, and the evidence minimal. Owners and managers may have pursued high-risk strategies when they no longer had anything to lose and gains were possible. Managers may have been following the pattern of self-justifying escalating commitment. In a few cases, Braniff and Wheeling-Pittsburgh, for example, managers have been quoted as being motivated by concern for employees, thus making value judgments about the distribution of wealth.

Laughhuunn, Payne, & Crum's (1980) thesis about risk preferences in the face of ruinous and nonruinous losses may provide at least a partial explanation for the persistence of managers in declining firms. The risk-seeking growth and debt strategies may have persisted because managers framed their decisions as risking nonruinous losses, and it was only when managers recognized that the bankruptcy option was a lower-risk option than continuing a potentially ruinous survival strategy that they were willing to choose the bankruptcy option.

Chapter Summary

The results of this study suggest that some failures are the result of unsuccessful turnaround efforts, but others are more catastrophic in character. Strategic turnarounds may have been difficult for the many relatively small single-business firms in the research sample. It is clear that asset pruning, a frequently recommended turnaround strategy, was not a popular

choice. Since this study involved entire firms, it was difficult to relate the results to Harrigan's work on declining industries, but 44 of the 73 failures were in growing, not declining, industries.

A major contribution of this work to the previous work work on organizational decline is its demonstration that new definitions of decline are necessary, if the prior work is to be applied to business decline. In most of the organizational decline work, decline is defined as decreasing size. In this study, most of the failures were preceded by growth in size. The findings here are more consistent with Starbuck's "success breeds failure" model than with Whetten's "decline as stagnation."

The observed pattern of growth that preceded failure in most firms is consistent with concepts of escalating commitment, but it is not clear what the growth motivations were. A similar problem is encountered in relating the study to work on prospect theory and risk preferences. The persistence of firms in the face of decline is consistent with increasing risk seeking in losing situations, but the heterogeneous mixture of stakeholders in bankruptcy situations and information uncertainty and lag make it difficult to assess the level of awareness of risk taking for individual decision makers.

Chapter 11

IMPLICATIONS FOR MANAGERS, INVESTORS, AND CREDITORS

Chapter Introduction

While the theoretical implications of the study discussed in the previous chapter are sometimes ambiguous, the implications for managers and and other stakeholders are more straightforward. This chapter attempts to spell out those implications for each of several stakeholder groups. Recognizing that the various stakeholder groups have divergent interests which change as the firm moves through the failure process, emphasis is placed on the importance of bankruptcy as a mechanism for conflict resolution. Attention is also directed to implications for the management of the declining firm and the bankruptcy process. In addition to consideration of direct stakeholder concerns, the chapter ends by raising some public policy issues.

Strategies for Failing Firms

One of the primary objectives of this study of failure, bankruptcy, and reorganization was to make direct suggestions about appropriate decision making for failing firms, including insights into both the avoidance of failure and also the

management of declining, failing, and reorganizing firms. The contributions were not aimed at managers alone, but also at investors, creditors, and other stakeholders. This chapter will attempt to identify some of the most important lessons which can be learned and applied in a general way. In addition to these generalities, there is reason to believe that a thoughtful, detailed consideration of the study would have even more value to a decision maker in a specific situation.

There will be an initial brief review of the main findings together with some general conclusions. This will be followed by a series of observations about specific problems faced by different stakeholder groups, including strategies for the maximization of the failing firm.

A Summary of Basic Findings

Four general observations on the failing firms as a group clearly emerge from this study. They are as follows:

1. The bankrupt firms were weaker five years before they failed than a matched group of nonfailing firms, and the matching group were weaker than the population from which they were drawn.
2. They pursued higher-risk strategies, greater debt, than comparable firms.
3. There were much wider ranges and variances of behavior and performance among the failing firms than among the

matched sample.

4. Bankruptcy outcomes were generally not favorable.

The detailed data on which these generalizations are based can be found throughout this dissertation. While these generalizations are true on average for the group of failing firms, they are not necessarily true for the individual firms, which exhibited a wide range of behavior.

Another very important observation was that intrafirm factors played a much larger role than environmental factors. It is true that the failing firms tended to be concentrated in industries under stress. Several of the industries suffered from foreign competition, including oil and gas, textiles, steel, and machinery. Deregulation was important for the transportation group, including both airlines and trucking. The distribution group, both wholesale and retail, was hurt by high interest rates. However, industry growth/decline was not found to be a significant predictor of behavior or performance. Also, the study on effects over time showed little effect over the period from 1970 to 1985. The use of a comparison sample of firms matched on industry, size, and time period may have masked some of the industry and time effects. On the other hand, the presence of these successful firms reinforces the point that in every environment some firms fail and some succeed.

There is one important limitation of the study that compels caution in interpretation of the findings and applications of the study. This is the fundamental issue of risk and return. It could be argued that the failing firms were a part of a larger group of firms which knowingly were pursuing high-risk strategies in pursuit of high returns, and that these firms represented only the low end of the distribution of returns. This would be consistent with Bowman's (1982) work on risk seeking by troubled firms. One piece of evidence that suggests that this is true is that the failing firms had lower operating returns and the matching successful firms had higher operating returns than the population from which they were drawn. Even if it was the case that the failures represented only the low segment of distribution of returns of a high-risk set of firms, the findings should still be useful in helping such high-risk firms control their losses.

Failure Definitions and Causes

In drawing any lessons from the study, it is necessary to both define failure and locate its causes. There can be many definitions of failure, and the only definition of failure that applies to every firm in the study sample is legally bankrupt. Some of the firms were failures by almost every imaginable definition, and some were successful by most standards. A brief discussion of failure may be helpful in interpreting the

results of the study.

The most common financial definitions of failure are that a firm has a negative net worth, or that its current cash inflows are insufficient to meet current obligations. Several of the firms went bankrupt on the basis of potential liabilities. This included the product liability cases, Manville, Robins, and UNR, and some others for which either wage or pension obligations created the potential for bankruptcy. Other firms declared bankruptcy because of the failure of one or more units, even though the firm as a whole was solvent, as in the cases of Charter and Revere.

It is probably fair to say that every firm represented a human failure of some sort. As was discussed in more detail in the introduction to this study, one of the foundation perspectives of this study was that the circumstances of failure may, or may not, be under the control of human decision makers, a classic example of determinism vs. free will (Bourgeios, 1984). Failure may come as a result of acts of God, such as natural disasters, or as the result of acts of individuals or organizations, such as industry deregulation by government, over which the firm and its managers have little or no control. However, even in those cases for firms as large as those studied here, outcomes are determined by the human response as well as the external event.

There is widespread evidence that bankruptcy is a costly solution to financial problems. These costs include both direct costs and indirect costs (Copeland & Weston, 1983; Bibeault, 1982; and others). There is further evidence of that in this study. Of 61 firms that had completed the bankruptcy process, only 12 continued in business with as much as 50% of their prebankruptcy business. In retrospect, nearly every firm would have been better served by avoiding bankruptcy, but the reasons for allowing the bankruptcy to occur were diverse and complex. Possible failure points include the failure to recognize a decline and its seriousness, the failure to act in a timely fashion, the pursuit of individual advantage over the common good, and failure to execute good decisions in an effective manner.

One useful way of looking at bankruptcy is as a failed negotiation. Once a decline has proceeded to the point that decisive action is required, almost every action requires the cooperation, or at least the consent, of two or more parties, which in turn requires negotiation. If there are significant bankruptcy costs, then the sum value of the firm available for distribution to claimants is reduced by that much by the bankruptcy process, and the common good would be better served by a negotiated prebankruptcy settlement. For a more extended discussion of this point, see Chapter 3. Therefore, a bankruptcy can be seen as the result of failed negotiations, just as a strike is the result of failed labor negotiations, or

as a war is the result of failed diplomacy. Also, as in the case of a strike or a war, bankruptcy is not a substitute for negotiations; it is part of the continuing negotiations. It may affect the relative strength of the parties, and it certainly alters the character of the negotiations by changing the rules and introducing new parties to the negotiation.

If bankruptcy is viewed as a failed negotiation, the question becomes why do the negotiations fail. Without repeating the extended discussion of divergent stakeholder claims in Chapter 9 on bankruptcy outcomes, the negotiations fail for two interrelated reasons. One is that the value of any outcome for any stakeholder cannot be known with certainty, so stakeholders have different perceptions of the expected values. The second is that individual stakeholders may seek outcomes that maximize their individual benefit, even if that outcome reduces the total value for all. The difficulties in evaluation are compounded by the use of bankruptcy and threats of bankruptcy as tactical maneuvers, side payments beyond legal claims, and the injection of subjective values, all of which may result in suboptimal outcomes.

Strategies for Value Maximization of Failing Firms

Avoiding failure and turning around declining businesses are large topics, and the literature is full of recipes, so this section will be limited to lessons that are particularly

relevant to the findings of this study. As in almost all management advice, and every other kind of human advice, it is not difficult to find exceptions to the prescriptions. Going against conventional wisdom is often a winning strategy, but it should be an informed strategy, with clear awareness of the risks involved.

Opportunities for preserving firm value arise at several different stages of the decline and failure process. The following sections describe some of those opportunities in the order in which they commonly occur.

Avoiding Decline and Failure

One of the strongest findings of the study is that pursuing high-risk strategies from weak positions compounds the risk. Five years before bankruptcy and while they were still profitable, the failing firms had less retained earnings as a fraction of their total assets than the nonfailing firms. Failing firms increased their assets and their sales more rapidly than the nonfailing firms, but not significantly so. The failing firms increased their debt by twice the amount of the matching firms, a highly statistically significant amount. While sales were increasing, margins were falling significantly, and the return on investment fell even faster.

From these observations,a reasonable scenario can be

constructed which suggests that as the failing firms increased their assets with borrowed money, they were forced to cut prices to maintain cashflow to cover their increased expenses. The lack of retained earnings, which would have provided a cushion for temporary losses, accentuated this problem. Increasing debt also meant increasing interest expense, and net income declined even faster than operating income. The sequence is supported by the finding that the increase in assets and debt occurred early, the increase in sales was continuous, and the sharp decrease in profitability came late. This sequence of events was developed more fully in Chapter 8. The case information supports this pattern most clearly for growth based on volume expansion. The study is dominated by single businesses, so the evidence is less clear in the case of growth based on acquisitions. In the one clear case of Wickes it appears that the pattern was similar, but the time frame was compressed.

The results are consistent with the work in finance on sustainable growth. Among the studies are those by Higgins (1977), Donaldson 1985), and Rappaport (1981). Growth can be limited by long term concerns over capital structure and leverage, and it can also be limited by cash flow considerations. The cash flow concerns have been stressed by Gale & Branch (1981) and Stancill (1987). The cash flow considerations may have been particularly important for the weak firms, since their access to capital markets may have been

limited.

In summary, the lesson appears to be that using increasing leverage to grow out of weakness is not a good strategy. The lack of any finding of significant industry effects suggests that the strategy may be just as inappropriate in a growing industry as in a declining one. In this stage of decline, the decision making is likely to be primarily managerial, but the lesson may also be important to creditors that underwrite the expansion.

Coping with Impending Failure

The lessons on avoiding decline and failure that can be drawn from this study are quite general and make little contribution to the existing literature. The study should make a larger contribution to the management of failure once it becomes imminent. More formally, the question might be stated as follows: how can the firm escape from a bad situation with the least value destruction for stakeholders? The problem has two important stages; one making the decision to terminate the business, the other executing the termination.

The problem of "knowing when to pull the plug'" as Staw & Ross (1987) call it, has received more attention at the project or business unit level than at the firm level. Harrigan (1982) has addressed the particular problems of exit in mature

industries. The problem is compounded by the interaction of rational analytical factors with subjective issues of a psychological and political nature. Both factors increase in difficulty when the continued existence of the organization is at stake.

In almost all the failures studied, the firms declined precipitously in the last year or two before bankruptcy, a finding consistent with the repeated observation that bankruptcy prediction models work quite well near bankruptcy, but that they have limited long-term predictive power. For some of the firms, the rapid failure followed an extended period of slow decline; for others it came with little warning. The evidence from the cases, together with the broader observation of the business world, suggests that the failures without the slow decline were primarily the result of a single bad decision or unfortunate circumstance. Wickes' purchase of Gamble-Skogmo is one example. Manville presents a somewhat more difficult case to categorize. While the asbestos liability problem had been developing over a long period of time, the potential liabilities were not included in regular financial reports, except as footnotes on litigation, until they filed for bankruptcy.

It is the firms with the slow declines which have major problems with knowing when to take decisive exit actions. The literature on escalating commitment (Staw & Ross, 1987)

suggests two ways of reducing prolonged commitment to a losing course of action. One is to set predetermined cutoff points, and another is to shift the exit decision to managers other than those who initiated the project. Good information and accurate analysis are also important and frequently difficult to obtain. Although the study provides no direct evidence on the point, it would appear that inadequate consideration was given to the costs of bankruptcy and the low probability of successful reorganization. Calculation of sunk costs and the direct costs of abandoning unsuccessful projects seems to be better developed, and both tend to encourage continuation of projects. Staw & Ross's recommendation to create incentives for managers to admit failure is more difficult to apply in firm failure than in project failure.

Once firm failure becomes a likely outcome, the question shifts from projects and short-term financial strategies to exit or reorganization strategies. At this point, a firm should determine as accurately as possible what its value and prospects are. Failing firms can generally be divided into three categories:

1. Firms whose businesses are fundamentally sound and need only temporary relief to rearrange their affairs and return to profitability.
2. Firms which have viable business units or product-markets but lack the corporate resources to maintain and operate those businesses.

3. Firms which do not have viable businesses.

In none of these cases is bankruptcy the first-choice option. In every case, as has been pointed out repeatedly in this dissertation, a negotiated settlement that avoids the direct and indirect costs of bankruptcy will optimize the joint value for stakeholders. In the first case, debt restructuring or some other similar action is indicated. In the second case, a merger or sale of the firm as a whole to a stronger parent is indicated. In the third case, liquidation is indicated.

In practice, the cases may not be so clear-cut, and cases may be mixed. A firm may have one or more sound businesses and one or more failing businesses. Those cases may require the divestiture or liquidation of the failing unit or units. In some cases, a firm may have to divest profitable units in order to protect other units more central to its core business. If the firm is in dire straits, it may be forced to divest units it would choose to keep because they are salable and use the proceeds to rebuild less attractive businesses. Just as in the decision to admit failure, there may be strong psychological pressures to resist rational choices. Long-term identification of the firm with some failing business, or personal attachments of key managers may inhibit divestiture of some units, a phenomenon observed by Duhaime & Grant (1984) in their work on divestments.

Decisions surrounding the exit-bankruptcy decision are

complicated by conflicts of interests among stakeholders. If a firm is sufficiently profitable, it can meet all of the legitimate claims that are made on it. Once it cannot, then stakeholders come into conflict, and a unified organizational strategy may be difficult to achieve. Bankruptcy is one mechanism for conflict resolution when voluntary agreement cannot be reached, but it is an expensive mechanism. If the costs and outcomes were known perfectly, it would be relatively easy for the stakeholders to settle their differences. This could be accomplished by making suitable side payments to some stakeholders. For example, if the liquidation value of the firm exceeded the claims of secured creditors, but it was not sufficient to meet the claims of unsecured creditors, and the firm's going concern value exceeded its liquidation value, the unsecured creditors might make a side payment to the secured creditors in order to get their approval of the reorganization. The side payment might take the form of an equity holding in addition to their continuing debt holdings. The major barrier to achieving consensus is in evaluating risk and in getting agreement on how much increase in return is required to compensate for increased risk. Bankruptcy does not eliminate the need to negotiate the outcomes; it merely changes the venue of the negotiations, adds the Bankruptcy Court as party, and increases the cost. If the firm is liquidated, the value of the assets tends to be less in a forced bankruptcy sale than otherwise.

Maximizing the Value of the Bankrupt Firm

The evidence seems to suggest that there are several strategies which can contribute to maximizing the value of the bankrupt firm. The relevance of these strategies for reorganizing firms may be more obvious than for liquidating firms, but the situations are really very similar. The same strategies which maximize the value of the reorganizing firms will also maximize the value of the assets of the liquidating firm. The first principle is if bankruptcy is inevitable, go sooner rather than later. Another is to, as far as possible, maintain normal operations during the reorganization process. The first is related to the second as the more resources the firm has when it goes bankrupt, the easier it is to maintain operations. The results for the airline firms in the study reinforce these principles. Braniff held off bankruptcy as long as possible and shut down all of its flight operations the day it filed for bankruptcy. It did not fly again until the reorganization was complete. The operations then were only about 10% of its prebankrupcty level and after several years of operation are still not profitable. Continental entered bankruptcy in order to relieve itself of potentially ruinous labor contracts, but did so while it was still solvent. Continental temporarily reduced operations, but in spite of a pilots' strike, it very soon was back in full operation and emerged from bankruptcy larger than it went in. Capitol Air was unprofitable five of the six years prior to bankruptcy and

had a negative net worth nearly as great as its total assets. It was driven into bankruptcy as a result of petitions for involuntary bankruptcy by unpaid employees and was liquidated by the Bankruptcy Court.

Mergers or acquisitions of bankrupt firms by other firms are somewhat of a middle ground between reorganization and liquidation. This strategy is particularly appropriate to the class of firms which have viable businesses, but which lack the corporate resources to maintain them. There are several possible forms of these acquisitions or mergers. Saxon Paper Company was acquired by Alco Standard and is now operated as a major subsidiary to that firm. In other cases, the acquirers were financial entities organized for the purpose of acquiring and recapitalizing the bankrupt firm. Braniff and Charter are examples. Another variation on this theme is the acquisition of the reorganized firm after the bankruptcy reorganization. Leisure Dynamics was acquired by Coleco, and Revere was taken over in a leveraged buyout.

Management of the Bankrupt Firm

Managing a firm in bankruptcy presents all of the problems of managing any other firm, plus many additional complications. The quality of management at this stage can have a major impact on the preservation of value of the firm. Managers of bankrupt firms have dual responsibilities: one is to manage the ongoing

activities and the other is to manage the bankruptcy.

If the firm is to be reorganized, managers must first decide what kind of a firm they want it to be, subject to the resources available. Existing assets and operations can be included in the reorganized firm, or they can be sold or liquidated. The problem is complicated by the necessity of satisfying the creditors, which may have diverse interests. The instrument for creating the new firm is the reorganization plan which is to be presented to the creditors and the Bankruptcy Court. Successful execution of the reorganization plan requires both planning and negotiating skills. The time pressures under which this must be accomplished may be intense. The Court may set time limits, and if the schedule is not met, then the creditors or a Court trustee may submit competing plans.

While the reorganization planning is going forward, continuing operations must be managed under difficult circumstances. Major elements of successful operation include the retention of key personnel, maintaining customer confidence, and securing cooperation from suppliers and financial institutions, which may also be unpaid creditors. Bankruptcy does provide some temporary benefits: interest on prebankruptcy debt is postponed, and unfavorable contracts can be cancelled. Good management of assets and units which are to be sold or liquidated is as important as that of managing

operations to be retained, since their sale value will affect the welfare of the reorganized firm. The management of the continuing operations is very similar to the management of the turnaround of an unprofitable, but not bankrupt, firm. One advantage the managers of the bankrupt firm may have is what they have learned from the firm's failure experience, a kind of retrospective learning. Managers of bankrupt firms may be disadvantaged by requirements for Court and creditor approval of routine decisions and the inability to control strategic information.

Management of the bankruptcy process requires special skills in negotiating and in legal affairs. The primary tasks of the manager of the bankruptcy are to bring a value-preserving end to the bankruptcy and to insulate to the extent possible the operational managers from the bankruptcy process. If business units or major assets are to be sold, making the best deal is complicated by the buyer's knowledge that the transaction is bankruptcy-driven. The biggest problem of all may be balancing the conflicting demands of the various creditor groups.

Stakeholder Perspectives

The strategies discussed in the previous section were related to the common stakeholder goal of value maximization of the failing firm. This section will take up strategies for

maximizing the value of specific stakeholders after the firm is unable to meet all of its legitimate claims. One of the important functions of bankruptcy is to establish priorities among the claimants. Without going into detail, the general order is postfiling claims, secured creditors, unsecured creditors, and stockholders. Legally, managers have no priority rights; they serve at the pleasure of the stockholders. After bankruptcy, the Bankruptcy Court may supervise or replace management.

The conflicts of interest that arise before bankruptcy frequently reflect jockeying for position in an anticipated bankruptcy. In determining the stakeholder interests it is necessary to maintain timely analyses of the value of the firm, as stakeholder interests shift as the value of the firm declines. At any point at which a claimant group's claim diminishes to zero, that group then has a vested interest in preserving the firm, but the shift may take place before the zero point is reached.

Stockholders

Stockholders are nearly always the biggest losers in bankruptcy, and at the same time are usually the least able to protect their rights. By the time the firm is financially, if not legally, bankrupt, stockholder value is technically zero. Therefore the best strategy for stockholders is to push for an

early nonbankrupt exit strategy. In pursuing this strategy they have two major disadvantages. First, stockholdings are usually widely dispersed, and stockholders are not organized. This may be particularly true of failing companies, as institutional investors tend to limit their holdings to large and relatively low-risk firms. This does provide an opportunity for large investors to buy up the distressed stock at bargain prices and force a new strategy. Second, as bankruptcy approaches, stockholders may be poorly served by their managers, who have a strong vested interest in firm survival. Information provided by managers for stockholders may be delayed or distorted. There is a widely held belief that new management is required for successful turnarounds (Hambrick, 1986; Bibeault, 1983, and others). This can be extended to bankruptcy reorganizations. Owners would be well advised to force changes in management, or at least create new incentives for managers to pursue new strategies. The CEO of UNR Industries has a contract that provides bonuses for completing the reorganization and for increasing stock prices prior to reorganization. Wickes is an example of bringing in new management either just before or after bankruptcy and giving the new management team an equity interest that rewards managers for preserving shareholder wealth. Manville and Robins both had their bankruptcy settlements delayed by intense personal opposition by creditors and claimants to entrenched managers. Limited stockholder control of managers may make effective action difficult, especially if the managers also

have major ownership interests, as in the Robins' case.

The bankruptcy process is complex and demanding. The best strategy in many situations may be to separate the responsibility for bankruptcy proceedings from that for continuing operations. This may be easier to say than to do. The restrictions imposed by bankruptcy affect many operational decisions. Court approval may be required for operational decisions, such as short-term financing, disposal of assets, and even personnel selection for key positions. On the other hand, the managers of the bankruptcy process need current and accurate information on the current and prospective value of operations, and they are the persons in contact with influential creditors. A common practice appears to be to make the bankruptcy management a corporate-level staff function and to minimize operational-level management involvement, but all under the direction of a single chief executive.

In summary, the best strategy for stockholders is to push for early exit and/or new management teams. If early exit is not accomplished and stock has no clear claim on assets, then stockholders may want to hold out as long as possible in order to maximize the possibility of obtaining side payments from other claimants. Claimants with valuable claims may be willing to buy their cooperation, thus reducing legal costs and delays in settlement. Many of the reorganizations studied gave old stockholders some stock in the new firm, but the value of the

stock was frequently limited by massive dilution and complicated capital structures with prior claims vested in new issues of preferred stock.

Secured and Unsecured Creditors

The interests of secured and unsecured creditors follow similar paths, but different time lines. At every point, creditors have to calculate the tradeoffs between uncertain liquidation values and risky going-concern values. Going-concern values may include the value of future business and other operational values as well as the face value of debt obligations. Reorganizations may require either paying off creditors in full or adding equity to debt holdings or other side payments. Side payments are not limited to monetary payments, but may include enhanced decision-making or manager-selection roles. In assessing current values, it is important to consider that firms in bankruptcy do not pay interest on prebankruptcy debt and have substantial freedom to cancel prebankruptcy contracts and leases, but they can execute contracts, borrow money at interest, and take other actions necessary to preserve the estate and conduct operations in bankruptcy. It is obvious that a debtor-in-possession can manipulate creditors by using these rights.

Information adequacy is a major problem for creditors. One advantage of bankruptcy is the opening up of the books of

the firm to all parties. However, the larger problem is in estimating expected values for alternative course of action. Neither liquidation nor going-concern values can be known with certainty under ideal circumstances, and where there are conflicting interests, estimates are regularly manipulated, intentionally or unintentionally, by stakeholders to further their own interests. Stakeholders should expect little direct assistance from the Bankruptcy Court, as its role is more to ensure due process than substantive equity. One of the ways it does this to organize committees of different classes of creditors and provide them with professional staffs.

The outcomes for creditor claims depends not only on the priority of the claim, but also on the management of the claim. The general observation is that banks and large financial institutions with large unsecured claims tend to be the best protectors of their own interests. Bondholders have the assistance of institutional trustees, but trustees may not play aggressive roles, particularly in the critical prebankruptcy phase. In the bankruptcy phase, they tend to play an appropriate low-risk role, demanding full payment for bondholders, either prior to reorganization or by liquidation. Individual bondholders and the bond-rating agencies are typically risk-averse. As a result, bonds are frequently available at bargain prices for declining and bankrupt firms. Banks and other suppliers of lines of unsecured credit can exert great influence over weak firms by imposing conditions on

the granting of credit extensions, both prior to and in bankruptcy. One of the advantages for owners and managers of early bankruptcy with continued operations is that the stronger the bankrupt firm is, the greater its ability to deal with creditors.

Managers

Managers of declining and failing firms occupy high-risk positions, with little or no legal claims on continued employment. The resulting tendency to be risk-seeking has been adequately discussed in the prior section on theory. A major problem of declining firms is the loss of key managers who choose to depart before crisis and failure are public knowledge. Managers that remain tend to get locked into old strategies and ways of doing business, which is why it is so important for owners to change managers or restructure their reward systems. The primary strategy for managers should be the traditional maximization of firm value, but it would be expected that they would give special attention to the maximum value for those who are in the best position to reward them.

Public Policy Issues

The focus of this chapter has been on private sector stakeholders, but the bankruptcy process also has major implications for public policy makers. Rather than attempting

to draw any conclusions, the approach will be to raise a limited number of questions which are suggested by the research and reflections on the more objective results.

1. Does bankruptcy, as it exists under the Bankruptcy Reform Act of 1978, meet its objective of fairly distributing the assets of failing companies and of providing a a new start for temporarily distressed firms?

The extent to which successful reorganization is determined by the size of the firm suggests that small firms are less well served than large firms. It also appears that large creditors may be better served than small creditors.

2. Has bankruptcy become an expensive and awkward substitute for other conflict resolution mechanisms?

The Texaco-Pennzoil case raises this issue most directly, but Continental Airlines and others have used bankruptcy as a mechanism for resolving labor disputes. These cases raise the possibility that bankruptcy becomes a court of last resort for the losing side in more conventional conflict resolution forums.

3. Does bankruptcy permit failing firms and creditors to shift costs unfairly to public agencies?

Currently the most critical concern has to do with pension costs, but the issue extends to unemployment, local taxes, long-term health problems, toxic waste cleanups, and many other issues.

4. Does the bankruptcy process allow excessive delays to the benefit of those with deep pockets at the expense of those who need quick resolution of their claims?

The Manville and other asbestos-related bankruptcies have gone unsettled for years as the victims have suffered and died without compensation. In those cases, lawyers for the claimants have contributed their share to the delays, again to the detriment of those who can afford it least.

5. Does bankruptcy provide a protective shield for criminal and unethical behavior?

The proportion of cases in which criminal activity was either proved or charged was so large that it appears that criminal activity is either a major cause of bankruptcy or that failing firms provide an attractive opportunity for the unscrupulous.

Many more questions could be raised, but this listing provides a more than adequate list for discussion and further investigation.

Chapter Summary

The study clearly points out that intrafirm factors are more important than environmental factors; firms are nearly as likely to fail in growing industries as declining industries.

It is also clear that most business failures are the result of human failures, not uncontrollable external events.

Perhaps the clearest message from the study is that high risk strategies, either strategic growth strategies or financial leverage strategies, for weak firms are undesirable. Pushing asset growth ahead of sales growth can only lead to declining returns. Declining returns lead to decreased strategic flexibility, and if the decline cannot be arrested, outcomes will be dictated by creditors and forces external to the firm. The evidence appears to suggest that stockholders and creditors would benefit from forcing exit decisions early, while the firm still has value. However, forcing early exit may require more effective negotiations and conflict resolution than is typically observed in decline situations.

The implications for stakeholders after the declaration of bankruptcy are much the same as those prior to bankruptcy. Prompt conflict resolution is value-enhancing for all, even if some claimants are given inducements beyond those legally required in order to secure their cooperation in expediting the bankruptcy process. Although the study provides little systematic evidence, the case evidence confirms the traditional advice that new management will provide better leadership than old management. The necessity of simultaneously managing the bankruptcy process and the ongoing operation of the firm makes the management task extraordinarily difficult.

The findings of the study and the discussion of managerial implications raise some important public policy issues. Bankruptcy may impose disproportionate costs on small stakeholders and also on public agencies.

Chapter 12

DIRECTIONS FOR FUTURE RESEARCH

Chapter Introduction

The purpose of this chapter is to suggest some problems that were not adequately covered in this study or which were raised by the findings. In some cases, issues recognized as important were deliberately excluded in order to keep the scope of the study manageable. In other cases, the available data were insufficient to address the issue. The suggestions made here clearly will not exhaust the possibilities for extensions of this work.

Research Methodology

This study is one of the first comprehensive studies of bankruptcy from the strategic management point of view. The study used multiple research methods, including the use of quantitative and qualitative data, cross-sectional and longitudinal data, and statistical and case study techniques. As would be expected with an exploratory study of this nature, it raised more questions than it answered, and it pointed to other interesting research topics for which even the questions cannot be properly formulated without further exploration. The

methodological contributions of this research are twofold. First, arguments over the virtues of logit and probit techniques over multidiscrimant analysis, while technically interesting, are probably not practically important in bankruptcy research, since data limitations dominate issues of statistical sophistication. Second, the careful use of matching sample methodologies to compare successful and unsuccessful firms points to a viable method for examining relative success and failure in strategy research.

Perhaps most importantly, the present work provides another demonstration of the power of using multiple methodologies and both cross-sectional and longitudinal data. Not only were multiple quantitative methods used, but the rich qualitative data of the case studies did much to illumine the statistical evidence. Harrigan (1983) and Miller and Friesen (1982) have argued eloquently for this broad approach to strategy research. However, this study also has proven that this approach is time-consuming and that significant findings are slow to develop.

Methodological Extensions

The study has tended to strengthen the position of existing work on bankruptcy prediction, particularly the Altman-based models. Applying the funds flow models of Gentry, Newbold, & Whitford to the firms in the data base developed in

this study would be a useful extension. Questions about the selection of matching samples remain. While careful matching of firms on one or more relevant criteria apparently improves the classification accuracy of prediction models, it raises questions about the use of models based on samples biased in this way in more general applications, such as credit rating.

This study made effective use of matched samples not only for the statistical classifications, but also for more qualitative comparisons. However, except for some subjective case analyses, the comparisons were made on a sample-to-sample basis. The data base would allow for at least limited paired case-by-case analyses. This technique was used effectively in the SAPPHO innovation project described by Freeman (1982) in his book on industrial innovation.

Data collection remains more of a problem than methodolgy. The basic conflict is between the use of incomplete and barren statistical databases and the labor-intensive pursuit of case information from bankrupt firms, Bankruptcy Court records, and other sources.

Logical Extensions of the Present Work

Presented below are a few suggestions for extensions of this study. Some come directly from this study, unfinished business, and some are more speculative ideas that seem to be

worth pursuing. In either case, the extensive database which was developed in this study should prove to be useful in attacking future research agendas.

Turnaround Strategies

The existing research on turnaround strategies (Hambrick & Schechter, 1983; Hofer, 1985; Schendel & Patten, 1976) have largely focussed on firms with slowly declining profits. This research has demonstrated that decline and failure are rooted in a wide variety of causes, not all of which fit the traditional pattern of decline. This points to the need for looking to a broader range of turnaround strategies. In some cases, when the decline is sudden and catastrophic, the appropriate source of strategy guidance may come from the crisis management literature (Starbuck, Greve, & Hedberg, 1978; Smart & Vertinsky, 1984).

In the common view, bankruptcy is the antithesis of turnaround, but this study and a number of prominent corporate examples point to the use of bankruptcy as a turnaround strategy. This view is fully consistent with the historic emphasis on bankruptcy as a process for rehabilitating debtors. The question that remains is when and how to use the bankruptcy strategy. The preliminary evidence suggests that bankruptcy is a costly strategy, but it may be the best alternative for at least some stakeholders in a failing firm.

Relative Value of Alternative Firm Exit Strategies

The evidence of the study clearly shows the declining value of the failing firms as they progress toward bankruptcy. The longer the decline, goes on the greater the losses for the firm as a whole. The question that arises is how do the losses in this exit strategy compare to alternative exit strategies for similarly situated firms. It would be useful to study the relative outcomes for declining firms that elect nonbankruptcy exit options. This would require the study of a larger sample of firms, classified in terms of a range of early indicators of decline and impending failure, which followed a variety of exit strategies, including both firm dissolutions and nonbankruptcy reorganizations.

Such a study would round out the turnaround studies (Hambrick & Schecter, 1983, and others) which have followed only successful turnarounds in detail. It would also give a firm-wide perspective on the business exit (Harrigan, 1982) and divestment (Duhaime & Grant, 1984) studies.

Distribution of Losses among Stakeholders

Over the period from the beginning of the decline through failure and bankruptcy, it is obvious that value is lost for

the firm as a whole. It is less clear how those losses are distributed among the firm's stakeholders. If the study period is extended to include the post bankruptcy period for reorganized firms, the question of relative distribution is even less clear. A study that would follow the fortunes of stakeholders through the process would be an attractive extension of this study.

An intriguing question about reorganization is whether it is a value-creating strategy or a way of resolving a current conflict between stakeholders by allowing outcomes to be settled by uncertain future events. Some reorganizations appeared to leave an entity of negligible value to stakeholders which would have received little or nothing in a clean-cut termination of the firm. If this does happen, the next question is how much does this gesture cost the stakeholders who have higher priority claims.

The complexity of the issue of relative stakeholder values is compounded by the changing value of the distributions over time during the decline and failure process. This raises questions about both the proper evaluation of outcomes at different points in time and the optimum strategies for the different classes of stakeholders.

Studies in this category would contribute to an ongoing stream of research on stakeholder conflicts. Some of this

research has been focused around the bankruptcy event and liquidation vs. reorganization decisions (Bulow & Shoven, 1978; Ang & Chua, 1980). It is also related to the broader issues of stockholder vs managerial conflicts and agency theory (Grabowski & Mueller, 1972, Jensen & Meckling, 1976; Williamson, 1963).

Effects of Bankruptcy on the Business Environment

One of the basic tenets of this study has been that decline and failure are frequently the result of environmental stresses, such as deregulation, import competition, and changes in industry structure. Whether in business or in any other system, individual behavior can be understood only in the context of the environment, but the environment is shaped by the behavior of the individuals in the system. So the question becomes: what effects do firm bankruptcies have on the firm's environment? The exit of a competing firm for any reason must have an effect on industry structure. Productive capacity may be eliminated or merely transferred to new ownership. Resources, such as raw materials and labor, and markets may be available for redistribution. New entry may be facilitated.

The effects may not be limited to competitors and single industries. Recent news reports indicate that a high bankruptcy rate in certain regions and industries, such as oil and gas and real estate in Texas and Oklahoma, has been a

contributing factor to the high incidence of bank and savings and loan failures. The transfer of pension liabilities to governmental agencies and increasing costs related to unemployment costs are examples of the social costs of bankruptcy.

Very little research work in this area has been done, although the pension issue has attracted major public policy attention. A preliminary study of the impact of bankruptcy on competitors in the airline industry (Moulton, 1986) reports that industry executives saw both good effects, primarily reduced competition and increased sales in some markets, and bad effects, decreased consumer confidence and less favorable access to the financial markets.

Issues that cut across business and public policy fields abound. The pension issue is only one of a set of questions relating to the extent to which for-profit firms should be permitted to dump their liabilities on public agencies. Current proposals for mandatory extended notices of plant closures have implications for bankruptcy strategies. For example, will the declaration of bankruptcy exempt the firm from the requirement of giving prior notice of a plant closing? If it does, will this provide another incentive for use of bankruptcy as a strategy?

The bankruptcy laws themselves are another issue.

Following the Continental Airlines bankruptcy, the law was changed to decrease the freedom of bankrupt firms to unilaterally break union contracts, but other questions about the fairness of current bankruptcy laws persist. Does the law allow low priority claimants to impede the reorganization process and extract ransom on the threat of prolonged conflict? In broader terms, do the expanded options of the Bankruptcy Reform Act of 1978 encourage tendencies toward litigious behavior and discourage less costly voluntary negotiations? For example, there are claims that stockholders of Pennzoil and Texaco both would have been better off if the firms would have split their differences down the middle rather than going the bankruptcy route.

Management of Decline and Failure

In setting the research objectives for this study, issues relating to internal management and decision making were largely defined away, except as they they were manifested in concrete decisions. Obviously this leaves a huge field to be explored. Major topics include decision making under stress and crisis management. This is particularly interesting because it appears that much of the managerial behavior and decision making was pathological in character. Firms clung to unprofitable strategies and displayed a strong tendency toward a mentality of going down with the ship at any cost.

Research in this area is closely related to the escalating commitment studies (Staw & Ross, 1987; Whyte, 1986; Bowen, 1987) and decision theory (Kahneman & Tversky, 1979; and others). The decision making under stress observation is related to the well-developed theory of Janis & Mann (1977) and the crisis management work of Smart & Vertinsky (1984) and Billings, Milburn, & Schaalman (1980).

The relationship between this study and the work on declining organizations is very close (Whetten, 1987). A major task is the expansion of the definitions of declining organizations to include businesses that are growing in size and declining in profitability. Sutton's (1983) work on managing organizational death is relevant, but his focus on human relationships needs to be expanded to business units and other less personal elements.

Effective research on the management of failure would require direct access to managers and the internal operations of failing firms. This study was explicitly extrafirm in perspective, but interviews, access to internal documents, and other intrafirm techniques would be useful in reaching meaningful understandings of many managerial questions and issues. Gaining access and gathering information can be expected to be unusually difficult. The number of bankrupt firms available for study is small to start with, and many disappear in the bankruptcy process. If the firm survives,

prebankruptcy managers, who may be the best informed on the failure process, are likely to have been replaced by newcomers. Access to the firm and responses to inquiries may be inhibited by the reluctance of firms under great stress to allow outsiders in or to take the time to respond to requests for information. Intensive study of a few cases may be the best research strategy. The case studies in the Appendix are a step in this direction, but they remain limited in their internal insights into managerial behavior. Another point of access may be the increasing number of consulting firms which specialize in turnarounds and bankruptcy management.

Chapter Summary

This chapter enumerated a variety of extensions of the present research and made some suggestions for research approaches. Since bankruptcy is only one exit strategy for failing businesses, studies of alternative strategies should be made to evaluate their relative success in value preservation for the firm as a whole and for separate stakeholder groups. The possibility that these failing firms were following high-risk--high-return strategies and that other firms pursuing the same strategies achieved abnormally high returns cannot be excluded.

This study has been extrafirm in perspective, and studies using direct access to managers of failing firms would add

immensely to the understanding of the failure process. They would also provide better insights into the problems associated with managing failing and bankrupt firms.

This study has addressed the question of the impact of industry characteristics on failing firms, but it would be interesting to study the effect of failing firms and bankruptcies on competitors and industry structure. The question of the effect of bankruptcy on public agencies and the general welfare also needs to be addressed.

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Information Sources

The following is a list of databases, directories, indexes, and periodicals which were used to obtain information on bankrupt firms. Information from these sources was used and reported in this dissertation without bibliographic references in the text.

Business Week

Company annual reports, bankruptcy disclosure statements, and SEC 10K reports.

Economic Report to the President

Dun & Bradstreet, Failure Record.

Financial Stock Guide Services, Directory of obsolete stocks.

Moody's Industrial Manual
Moody's OTC Industrial Manual
Moody's Transportation Manual

Predicasts Basebook
Predicasts Index

Prentice-Hall, Capital Adjustments.

Standard and Poor's, Compustat Industrial, OTC, and Research Files
Standard and Poor's, Corporation Records
Standard and Poor's, Register of Corporations, Directors and Executives

Value Line Investment Survey

Wall Street Journal
Wall Street Journal Index
New York Times

Statistical Computational Procedures

Unless otherwise noted here or in the text, all statistical computations were done using SAS procedures, as described in SAS User's Guide, 1982 Edition, SAS Institute Inc., Cary, North Carolina.

The stepwise multidiscrimant analyses were done using SPSS procedures, as described in Nie, N. H., Hull, C. H., Jenkins, J. G., Steinbrenner, K., & Bent, D. H. 1975. Statistical package for the social sciences (2nd ed.). McGraw-Hill, New York.

The logit and probit analyses were done using SHAZAM procedures, as described in White, K. J. 1982. Shazam: An econometrics computer package, Version 4.5. Department of Economics, University of British Columbia, Vancouver, B. C., Canada.

Appendix A

BRIEF DESCRIPTIONS OF THE BANKRUPT FIRMS

This appendix contains a list of the 73 bankrupt firms on which this study was based. Along with the name of each firms there is a brief description of the firm, including some limited data about it before and after bankruptcy.

The following notes will assist in interpreting the abbreviated firm sketches which follow. More precise definitions and data interpretation can be found in other sections of this dissertation.

The founding date is first date reported in Moody's or Standard and Poor's or similar sources for the parent company, even if the parent has acquired older firms.

The assets at bankruptcy are taken from the balance sheet in the last annual report prior to bankruptcy. The assets after bankruptcy are estimates taken either from the first annual reports following the completion of the reorganization process or from reorganization disclosure statement pro forma balance sheets or liquidation analyses.

All firms in the study filed for bankruptcy under Chapter 11 of the Bankruptcy Code. Some of the firms are known to have been liquidated by the debtors-in-possession under Chapter 11. In some cases it is not known whether the liquidation was completed in this fashion, or whether the Chapter 11 bankruptcies were converted to Chapter 7 cases, in which case the liquidation would have been managed by a bankruptcy trustee.

For bankrupt firms whose assets and organization were acquired largely intact by existing firms, the name of the acquiring firm is reported.

Exchange is the stock exchange on which the firm's stock traded immediately before bankruptcy and after bankruptcy. NYSE = New York Stock Exchange, ASE = American Stock Exchange, OTC = over-the-counter and regional stock exchanges. None = firm is reported as reorganized, but its stock is not listed in Standard and Poor's Corporate Register or Prentice-Hall's Capital Changes Reporter as a currently traded stock. In most of the cases for which no exchange after bankruptcy reorganization is listed, the firms were taken private by new investors in the reorganization process.

A number of firms essentially disappeared from the public record after announcing bankruptcy reorganization. All of these were very small. Some may have been reorganized as corporate shells which were never used, and others were probably liquidated or maintained as private investments.

The failure pathways are those described in Chapter 7 and used throughout this study. In addition to the systematic information, some additional specific information about selected cases has been included to enrich the listing.

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BANKRUPT FIRMS

AM International, Inc. (Formerly: Addressograph-Multigraph)
Founded 1924. Bankrupt 1982. Assets $546M. Exchange ASE.
Reorganized 1984. Assets $330M. Exchange ASE.
Dominant business in manufacture and distribution of office and printing equipment.
Failure pathway: Declining sales in a growing industry.

Advent Corporation
Founded 1967. Bankrupt 1981. Assets $13M. Exchange OTC.
Liquidated 1982.
Single business in manufacture of high quality sound equipment.
Failure pathway: Growing sales in a growing industry.

Altec Corporation
Founded 1964. Bankrupt 1983. Assets $23M. Exchange ASE.
Reorganized 1985. Acquired by Gulton Industries.
Single business in manufacture of high quality sound equipment.
Spin-off from LTV in early seventies.
Failure pathway: Declining sales in a declining industry.

Amfesco Industries
Founded 1925. Bankrupt 1985. Assets $88M. Exchange NYSE.
Reorganized as New American Shoe Co., Inc. Assets $22M. Exchange NYSE.
Single business in manufacture of men's shoes. Full scale operations in bankruptcy.
Failure pathway: Growing sales in a declining industry.

Anglo Energy
Founded 1968. Bankrupt 1983. Assets $337M. Exchange ASE.
Reorganized 1986. Assets $120M. Exchange ASE.
Dominant business in oil and gas production.
Caught in the general depression of the petroleum industry.
Complex corporate structure. After bankruptcy controlled by Equity Strategies Inc.
Failure pathway: Growing sales in a growing industry.

Argo Petroleum
Founded 1970. Bankrupt 1986. Assets $60M. Exchange ASE.
Reorganized 1987 as Fortune Petroleum Co. Largely liquidated.
Exchange other.
Single business in oil and gas production.
Failure pathway: Growing sales in a growing industry.

Auto Train Corp
Founded 1969. Bankrupt 1980. Assets $28M. Exchange ASE.
Liquidated 1981.
Single business in contract transportation of automobiles by rail from Northeast to Florida. Unsuccessful business concept.
Failure pathway: Declining sales in a declining industry.

Barclays Industries Inc.
Founded 1969. Bankrupt 1981. Assets $7M. Exchange OTC.
Liquidated 1984.
Single business in manufacture of shelving and paneling.
Failure pathway: Declining sales in a growing industry.

Beker Industries
Founded 1971. Bankrupt 1985. Assets $341M. Exchange NYSE.
In reorganization. Exchange NYSE.
Single business in phosphate fertilizer production.
Change of management June 1986. Reorganization plan calls for 80% acquisition by new firm created by old management.
Failure pathway: Declining sales in a declining industry.

Berry Industries Corporation
Founded 1962. Bankrupt 1984. Assets $40M. Exchange ASE.
Reorganized 1986. Assets $5M. Exchange other.
Single business in oil field services. Caught in the general depression in the petroleum industry.
Failure pathway: Growing sales in a declining industry.

Berven Carpet Corporation
Founded 1937. Bankrupt 1983. Assets $10M. Exchange OTC.
Liquidated 1985.
Single business in carpet production.
Failure pathway: Declining sales in a declining industry.

Bobbie Brooks
Founded 1946. Bankrupt 1982. Assets $83M. Exchange OTC.
Reorganized 1983. Assets $27M. Exchange OTC.
Single business in women's clothing production. Survived with major reduction in size.
Failure pathway: Declining sales in a growing industry.

Branch Industries
Founded 1968. Bankrupt 1984. Assets $52M. Exchange ASE.
Liquidated 1986.
Single business in trucking.
Failure pathway: Declining sales in a declining industry.

Braniff International Airways
Founded 1930. Bankrupt 1982. Assets $1008M. Exchange NYSE.
Reorganized 1983. Assets $69M. Exchange OTC.
Single business in air transport. Initiated an overly ambitious expansion program immediately following airline deregulation. No significant operations in bankruptcy.
Failure pathway: Growing sales in a growing industry.

CS Group
Founded 1956. Bankrupt 1982. Assets $12M. Exchange ASE.
Reorganized 1983. Exchange none.
Single business in women's clothing production.
Bankrupt again in 1984 and liquidated 1986.
Failure pathway: Growing sales in a growing industry.

Capitol Air
Founded 1946. Bankrupt 1984. Assets $35M. Exchange OTC.
Liquidated 1986.
Single business in air transport; heavily dependent on charter operations.
Failure pathway: Growing sales in a growing industry.

Charter Company
Founded 1959. Bankrupt 1984. Assets $1813M. Exchange NYSE.
Reorganized 1987. Assets $264M. Exchange NYSE.
Conglomerate of petroleum production and marketing, insurance, publishing, broadcasting, and other businesses. Failure was primarily in the petroleum segments. Most of the nonpetroleum segments were divested in the reorganization process. The reorganized company will be controlled by American Financial Company.
Failure pathway: Growing sales in a growing industry.

Commodore
Founded 1952. Bankrupt 1985. Assets $62M. Exchange ASE.
Reorganized 1986. Acquired by Great American Management and Investment Inc.
Single business in manufactured home production. Class action civil charges of fraud and misconduct.
Failure pathway: Growing sales in a declining industry.

Continental Airlines
Founded 1934. Bankrupt 1983. Assets $843M. Exchange NYSE.
Reorganized 1986. Assets $1159M. Exchange ASE.
Single business in air transport. After a brief interruption recovered full operation in bankruptcy. Bankruptcy was used to break high cost labor contracts. Emerged larger and stronger than ever. Controlled and predominantly owned by Texas Air Corporation.
Failure pathway: Growing sales in a growing industry.

Continental Steel (Penn-Dixie Industries)
Founded 1896. Bankrupt 1980. Assets $176M. Exchange ASE.
Reorganized 1982. Assets $83M. Exchange ASE.
Related diversifier in steel and cement. Reorganized as the Continental Steel Corporation, which went bankrupt in 1985 and was liquidated 1986.
Failure pathway: Declining sales in a growing industry.

Cook United
Founded 1921. Bankrupt 1984. Assets $166M. Exchange NYSE.
Reorganized 1986. Assets $66M. Exchange NYSE.
Single business in discount department stores. Major reduction in assets. Transfer of control and management to Retail Strategies, Inc. Bankrupt again in 1987.
Failure pathway: Declining sales in a declining industry.

Cooper Jarrett
Founded 1934. Bankrupt 1981. Assets $23M. Exchange ASE.
Liquidated 1985.
Single business in motor transport.
Failure pathway: Declining sales in a declining industry.

Crompton
Founded 1807. Bankrupt in 1984. Assets $97M. Exchange ASE.
Liquidated 1987.
Single business in textile production.
Failure pathway: Declining sales in a declining industry.

Data Access Systems
Founded 1969. Bankrupt 1983. Assets $58M. Exchange ASE.
Reorganized 1984. Assets $30M. Exchange OTC.
Single business in computer peripherals. Charges of improper financial manipulation and reporting.
Failure pathway: Growing sales in a growing industry.

Eastmet
Founded 1972. Bankrupt 1986. Assets $147M. Exchange OTC.
Reorganized 1988. Assets $70M. Exchange other.
Single business in steel production.
Failure pathway: Declining sales in a declining industry.

Flame Industries Inc.
Founded 1959. Bankrupt 1983. Assets $23M. Exchange OTC.
Reorganized 1985. Assets $0.3M. Exchange other.
Dominant business in oil field equipment, but also in metal treatment.
Failure pathway: Growing sales in a declining industry.

Garland Corporation
Founded 1937. Bankrupt 1980. Assets $25M. Exchange OTC.
Reorganized 1980. Exchange none.
Single business in women's clothing production.
Failure pathway: Declining sales in a declining industry.

Gilman Services
Founded 1970. Bankrupt 1982. Assets $33M. Exchange OTC.
Reorganized 1985. Exchange none.
Single business in wholesale drugs.
Failure pathway: Growing sales in a growing industry.

Global Marine
Founded 1964. Bankrupt 1986. Assets $1573M. Exchange NYSE.
In reorganization. Exchange NYSE. Major reduction in size.
Single business in petroleum production. One of the world's largest provider of offshore drilling rigs.
Failure pathway: Growing sales in a declining industry.

Glover Inc.
Founded 1955. Bankrupt 1980. Assets $23M. Exchange OTC.
Liquidated 1981.
Single business in meat products. Small regional producer.
Failure pathway: Declining sales in a growing industry.

Good (L. S.) Co.
Founded 1922. Bankrupt 1980. Assets $33M. Exchange ASE.
Liquidated 1980.
Single business in department stores.
Failure pathway: Declining sales in a growing industry.

KDT Industries Inc.
Founded 1961. Bankrupt 1982. Assets 240M. Exchange NYSE.
Reorganized 1984. Acquired by Ames Department Stores.
Single business in department stores.
Failure pathway: Growing sales in a growing industry.

K-Tel International Inc.
Founded 1968. Bankrupt 1984. Assets $87M. Exchange ASE.
Reorganized 1985. Assets $12M. Exchange OTC.
Single business in wholesale record distribution with investment in oil and gas properties.
Failure pathway: Declining sales in a declining industry.

LTV Corporation
Founded 1956. Bankrupt 1986. Assets $6307M. Exchange NYSE.
In reorganization. Exchange NYSE.
Unrelated diversifier with major interests in steel and aerospace-defense. Bankruptcy forced by losses in the steel segment.
Failure pathway: Declining sales in a declining industry.

Leisure Dynamics
Founded 1946. Bankrupt 1983. Assets $23M. Exchange OTC.
Reorganized 1983. Assets $13M. Exchange OTC.
Single business in toy production. Major recovery in reorganization. Acquired by Coleco 1986.
Failure pathway: Declining sales in a growing industry.

Lionel Corporation
Founded 1901. Bankrupt 1982. Assets $222M. Exchange NYSE.
Reorganized 1985. Assets $112M. Exchange ASE.
Dominant business in retail toy stores, but also in electronics production. Divested the nonbankrupt electronics subsidiary.
Failure pathway: Growing sales in a declining industry.

Lynnwear Corporation
Founded 1957. Bankrupt 1981. Assets $19M. Exchange OTC.
Liquidated 1983.
Single business in women's clothing.
Failure pathway: Declining sales in a growing industry.

MGF Oil
Founded 1970. Bankrupt 1984. Assets $228M. Exchange OTC.
In reorganization. Assets depeleted.
Single business in petroleum production.
Failure pathway: Growing sales in a growing industry.

Magic Marker Corporation
Founded 1959. Bankrupt 1980. Assets $16M. Exchange OTC.
Liquidated 1981.
Single business in writing instruments. A new firm bought the name and the trademarks. It subsequently also went bankrupt.
Failure pathway: Declining sales in a declining industry.

Manville Corporation
Founded 1858. Bankrupt 1982. Assets $2298M. Exchange NYSE.
In reorganization. Exchange NYSE.
Related diversifier in building products. Historically leading asbestos producer. Elected bankruptcy as a defense against mounting product liability claims from asbestos-related disease. Firm survived essentially intact, but ownership and control vested in a trust for asbestos victims.
Failure pathway: Growing sales in a growing industry.

Marion Corporation
Founded 1964. Bankrupt 1983. Assets $164M. Exchange OTC.
Reorganized 1986. Largely liquidated. Exchange other.
Single business in petroleum production.
Failure pathway: Growing sales in a growing industry.

McLouth Steel
Founded 1934. Bankrupt 1981. Assets $446M. Exchange OTC.
Reorganized 1984. Assets $9.6M. Exchange other.
Single business in steel production. Reorganized as MLX Corp.
Failure pathway: Growing sales in a growing industry.

Mego International Inc
Founded 1954. Bankrupt 1982. Assets $46M. Exchange ASE.
Reorganized 1983. Assets $1M. Exchange none.
Single business in toy manufacture. Reorganized as Mego Corp.
Failure pathway: Declining sales in a growing industry.

Mesta Machine Co.
Founded 1898. Bankrupt 1983. Assets $74M. Exchange NYSE.
Reorganized 1984. Assets $12M. Exchange NYSE.
Related diversifier in the machinery industry. Reorganized as Mestek, Inc.
Failure pathway: Declining sales in a growing industry.

Mobile Homes Industries
Founded 1968. Bankrupt 1984. Assets $44M. Exchange NYSE.
Reorganized 1986. Assets $2M. Exchange none.
Dominant business in mobile home sales and financial services and real estate related to mobile home sales. Assets on reorganization were largely long-term receivables from mobile home sale financing.
Failure pathway: Declining sales in a declining industry.

Morton Shoe Cos.
Founded 1930. Bankrupt 1982. Assets $30M. Exchange ASE.
Reorganized 1983. Exchange other.
Single business in shoe industry, but vertically integrated in production and sales.
Failure pathway: Declining sales in a growing industry.

National Shoes Inc.
Founded 1934. Bankrupt 1980. Assets $52M. Exchange OTC.
Reorganized 1985. Acquired by the Shoecliff Corp.
Single Business in shoe retailing.
Failure pathway: Declining sales in a growing industry.

Nucorp Energy
Founded 1967. Bankrupt 1982. Assets $731M. Exchange OTC.
Reorganized 1987. Assets $37M. Exchange other.
Dominant business in petroleum production. Assets grew from $91M in 1979 to $731M in 1981.
Failure pathway: Growing sales in a growing industry.

Pathcom Inc.
Founded 1970. Bankrupt 1981. Assets $6M. Exchange OTC.
Reorganized 1983. Exchange none.
Single business in the importing, manufacture, and distribution of communications equipment.
Failure pathway: Declining sales in a growing industry.

Phoenix Steel Corporation
Founded 1783. Bankrupt 1983. Assets $137M. Exchange ASE.
Reorganized 1985. Assets $117M. Exchange OTC.
Single business in steel production.
Failure pathway: Growing sales in a declining industry.

Poloron Products Inc.
Founded 1937. Bankrupt 1981. Assets $20M. Exchange ASE.
Reorganized 1983. Assets $18M. Subsidiary of Centuri Corp.
Dominant business in wood products, but also in metal buildings.
Failure pathway: Declining sales in a growing industry.

Revere Copper and Brass Inc.
Founded 1928. Bankrupt 1982. Assets $474M. Exchange NYSE.
Reorganized 1985. Assets $274M. Exchange NYSE.
Related diversifier in copper and aluminum, both primary production and fabrication. Used bankruptcy to divest some unprofitable production facilities. Subsequently acquired by JOZI Corp.
Failure pathway: Growing sales in a declining industry.

Richton International Corp.
Founded 1913. Bankrupt 1980. Assets $53M. Exchange OTC.
Reorganized 1981. Assets $19M. Exchange OTC.
Dominant business in costume jewelry, but also in women's clothing.
Failure pathway: Declining sales in a declining industry.

Robins (A.H.) Company
Founded 1866. Bankrupt 1985. Assets $648M. Exchange NYSE.
In reorganization. Exchange NYSE.
Related diversifier in drugs, cosmetics, and related products.
Elected bankruptcy as a defense against mounting product liability claims from Dalkon Shield intrauterine devices.
Bitter reorganization conflicts in family-controlled firm.
Failure pathway: Growing sales in a growing industry.

Robintech Inc.
Founded 1942. Bankrupt 1983. Assets $71M. Exchange ASE.
Reorganized 1984. Assets $67M. Exchange other.
Dominant business in plastics, but also in machinery.
Failure pathway: Declining sales in a growing industry.

Rusco Industries Inc.
Founded 1945. Bankrupt 1982. Assets $39M. Exchange OTC.
Reorganized 1983. Assets $15M. Exchange OTC.
Single business in wood and metal doors. SEC charges of misused funds. Former CEO held liable, but he filed for personal bankruptcy. Company bankrupt again in 1986.
Failure pathway: Declining sales in a growing industry.

Salant Corporation
Founded 1919. Bankrupt 1985. Assets $110M. Exchange NYSE.
Reorganized 1986. Assets $80M. Exchange NYSE.
Single business in men's clothing production.
Failure pathway: Declining sales in a growing industry.

Sambo's Restaurants
Founded 1961. Bankrupt 1981. Assets $442M. Exchange ASE.
Liquidated 1986. Assets sold to Vicorp Restaurants.
Single business in restaurants.
Failure pathway: Growing sales in a growing industry.

Saxon Industries
Founded 1924. Bankrupt 1982. Assets $486M. Exchange NYSE.
Reorganized 1985. Acquired by Alco Standard.
Related diversifier in the paper industry, with interests in advertising. Top management convicted of looting the company.
Failure pathway: Growing sales in a growing industry.

Smith International
Founded 1937. Bankrupt 1986. Assets $817M. Exchange NYSE.
Reorganized 1987. Assets 372M. Exchange NYSE.
Dominant business in oil field services. Bankruptcy precipitated by a patent infringement judgment for $207 million in a case brought by Hughes Tool Company.
Failure pathway: Declining sales in a declining industry.

Solomon, Sam, Inc.
Founded 1909. Bankrupt 1980. Assets $45.
Reorganized 1982. Acquired by Service Merchandise Co.
Single business in catalog show rooms and other retail outlets.
Failure pathway: Growing sales in a declining industry.

Steelmet Inc.
Founded 1961. Bankrupt 1983. Assets $85M. Exchange ASE.
Reorganized 1985. Acquired by Elg Haniel Metals Corp.
Single business in scrap metals.
Failure pathway: Growing sales in a declining industry.

Stevcoknit Inc.
Founded 1971. Bankrupt 1981. Assets $32M. Exchange OTC.
Reorganized 1983. Acquired by J. P. Stevens.
Single business in knit textiles.
Failure pathway: Declining sales in a growing industry.

Storage Technology Corporation
Founded 1969. Bankrupt 1984. Assets $1266M. Exchange NYSE.
Reorganized 1987. Assets $919M. Exchange NYSE.
Single business in computer peripherals.
Failure pathway: Growing sales in a growing industry.

Tacoma Boatbuilding Inc.
Founded 1947. Bankrupt 1985. Assets $278M. Exchange NYSE.
Reorganized 1987. Assets $18M. Exchange NYSE.
Single business in shipbuilding and repair. High-risk venture in waste disposal vessels.
Failure pathway: Declining sales in a declining industry.

Tobin Packing Co., Inc.
Founded 1942. Bankrupt 1981. Assets $34M. Exchange OTC.
Liquidated 1984.
Single business in meat packing and distribution.
Failure pathway: Declining sales in a growing industry.

Towle Manufacturing Company
Founded 1880. Bankrupt 1986. Assets $135M. Exchange NYSE.
Acquired by First Republic Corporation of America.
Related diversifier silver and glass home products production.
Failure pathway: Growing sales in a growing industry.

Transcontinental Energy Corporation
Founded 1947. Bankrupt 1984. Assets $100M. Exchange ASE.
Liquidated 1985.
Single business in petroleum production.
Failure pathway: Declining sales in a declining industry.

UNR Industries Inc.
Founded 1918. Bankrupt 1982. Assets $233M. Exchange NYSE.
In reorganization. Exchange OTC.
Unrelated diversifier in steel and steel products, asbestos, and other products. Bankruptcy driven by asbestos product liability claims. Firm has maintained assets and is currently profitable.
Failure pathway: Growing sales in a growing industry.

Upson Company
Founded 1910. Bankrupt 1980. Assets $15M. Exchange OTC.
Liquidated 1984.
Single business in wood products.
Failure pathway: Declining sales in a growing industry.

Wheeling-Pittsburgh Steel Company
Founded 1852. Bankrupt 1985. Assets $1220M. Exchange NYSE.
In reorganization. Exchange NYSE.
Single business in the steel industry, with significant vertical integration. Bankruptcy driven by high-cost union labor contracts in a depressed industry.
Failure pathway: Declining sales in a declining industry.

White Motor Corporation
Founded 1915. Bankrupt 1980. Assets $630M. Exchange OTC.
Reorganized 1983. Assets $19M. Exchange OTC.
Diversified business in truck and farm equipment manufacture.
Reorganized as Northeast Ohio Axle Company, now NEOAX Corp., which has made several large acquisitions.
Failure pathway: Declining sales in a growing industry.

Wickes Companies Inc.
Founded 1890. Bankrupt 1982. Assets $1553M. Exchange NYSE.
Reorganized 1984. Assets $1313M. Exchange ASE.
Diversified business in lumber, grocery, hardware, and retail lines, and also in related activities. Bankrupt following a series of acquisitions, including an over-priced acquisition of Gamble-Skogmo.
Failure pathway: Growing sales in a growing industry.

Appendix B

CASE STUDIES OF REPRESENTATIVE BUSINESS FAILURES AND REORGANIZATIONS

This appendix is made up of eight case studies of representative business failures, bankruptcies, and reorganizations. The cases have been prepared in a uniform format to facilitate comparison between firms on key areas of interest.

Two cases from each of the four failure pathways developed in this study are included to demonstrate that firms can fail both when they and their industry are growing and when they are declining. The firms with declining sales in declining industries are Crompton and Wheeling-Pittsburgh Steel. The firms with declining sales in growing industries are AM International and Salant. The firms with growing sales in declining industries are Lionel and Revere. The firms with growing sales in growing industries are Braniff and Continental Airlines.

Although not a criterion for selection, most of the firms were successfully reorganized, which was not typical of the firms in the study. The exceptions are Braniff, which was classified an unsuccessful reorganization, Crompton, which was liquidated, and Wheeling-Pittsburgh Steel, which is still in

bankruptcy. The overrepresentation of successfully reorganized firms was based in part on the belief that they were more interesting and useful cases than liquidations. Also, for many of the smaller firms which were liquidated, there was inadequate information to do good case studies.

Information for these case studies came from public sources, both primary and secondary. Primary sources included company annual reports, SEC 10k filings, and bankruptcy reorganization plans. Secondary sources included Moody's Manuals, Standard and Poor's Corporate Records, and newspapers, primarily the Wall Street Journal. No attempt was made to document the specific sources of information.

The case studies were designed to stand alone, but they do utilize terminology, classification schemes, and concepts developed in the main body of this study. The cases were completed in July 1988, after the other parts of the study had been finished several months earlier. As a result, there may be some differences between information in the two sections, particularly on reorganization outcomes.

Appendix B1

AM INTERNATIONAL, INC.

Summary

Founded 1924. (formerly Addressograph-Multigraph)
Dominant business in the manufacture and distribution of office and printing equipment.
Failure pathway: Declining sales in a nondeclining industry.
Bankrupt 1982. Assets $546M. Exchange NYSE.
Reorganized 1984. Assets $330M. Exchange ASE (NYSE 1988).

Figure B1.1

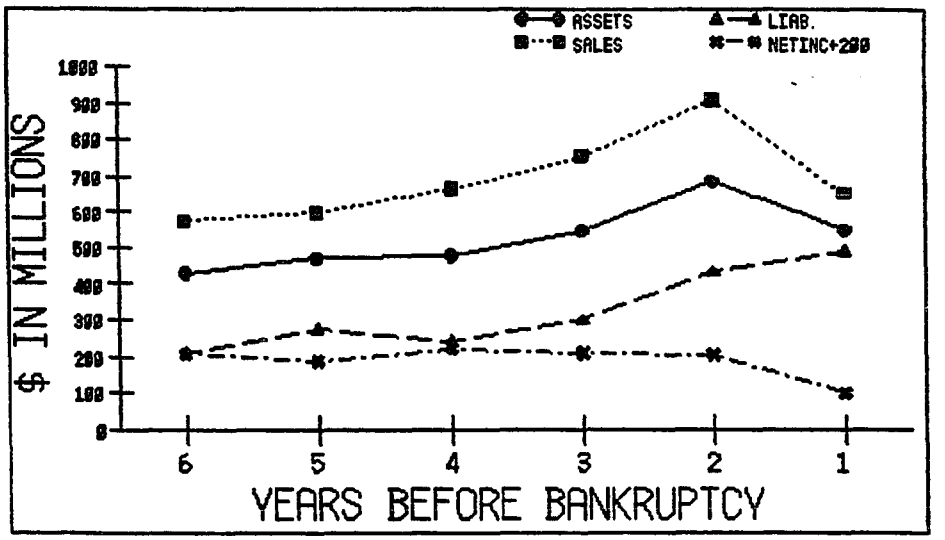

Table B1.1

AM INTERNATIONAL, INC.
(Bankruptcy Year 1982)

			Years Before Bankruptcy					
			6	5	4	3	2	1*
Total Ass.	mil	$	428	470	479	544	686	546
Sales	mil	$	573	596	667	755	910	653
Net Inc.	mil	$	6	-14	21	9	4	-102
Common Eq	mil	$	218	198	218	228	232	-94
Liabil.	mil		210	273	243	298	433	491
Stock Price		$	13.25	15.5	21.5	16.75	15.5	4.12
ROI								
Altman Z			2.68	2.37	2.86	2.54	2.19	.88
NZ5V			1.52	1.21	1.57	1.28	.97	-.66
NZ2V			1.51	1.20	1.53	1.28	.99	-.70

* Data as reported by Compustat, but not completely consistent with either the original or restated annual report data.

Historical Background

The history of AM International goes back to the Addressograph Co., established in 1896, and the American Multigraph Co., in 1902. AM International was founded in 1924 in Delaware as Addressograph Securities when it was organized to buy a half interest in the Addressograph Co. In 1927 it acquired the remainder of Addressograph. In 1930 American Multigraph was acquired. In 1931 the firm was renamed Addressograph-Multigraph, which it remained until 1979 when the present name was adopted. Subsequently a firm acquired and divested a number of smaller firms and foreign subsidiaries in the field of printing and office equipment.

By 1976 Addressograph-Multigraph had become a leading supplier of mechanical duplicators and addressing machines. Although its market share of the industry as traditionally defined was high, new technology was rapidly changing the industry,and new competitors were entering the larger redefined market. Profits had fallen sharply, but the firm was still marginally profitable.

Industry Factors

During the first half of the 20th century office, printing and addressing equipment exhibited a low rate of innovation with no revolutionary developments. Beginning about 1960 the

commercial development of xerography and office computers brought rapid change to this mature industry. New technologies not only replaced existing technologies in existing markets, but also introduced new products performing similar functions to a much wider range of customers. As was typical in such technological revolutions, there were a large number of new competitors, some startups and others established firms. Many of the new competitors were domestic, but the Japanese also became active in the industry as one more piece of their emerging role as suppliers of electronic equipment.

Traditionally firms in the industry had been providers of both equipment and supplies, such as paper, ribbons, and other equipment-related supplies. During the same period that the technology was rapidly changing, a series of antitrust actions led to significant reductions in the ability of equipment makers to tie buyers of equipment to supply contracts. As a result of all these changes, the industry became increasingly chaotic during the period from 1960 to 1980.

This period from 1960 to 1980 was also characterized by high levels of merger and acquisition activity. Unrelated diversification strategies were popular, new conglomerates were being formed, and there was an active market for small firms, especially high tech startups.

Firm Factors

Until the late 1960s Addressograph-Multigraph held a large market share in the printing and addressing industry. Stock prices had been as high as $90 per share and dividends $1.40. However, from 1970 to 1976 the firm declined dramatically; net income hovered just above zero, dividend payouts declined, and stock traded in the range of $1 to $5. Although dividend payouts exceeded net income several years, the book value of assets and common equity held nearly constant.

In 1976 institutional investors, which had accumulated substantial blocks of stock, recruited Roy Ash to be Chairman and CEO of the firm. Ash had been the founder of Litton Industries and subsequently served as Director of the Office of Management and Budget in the Nixon administration. Ash immediately set about turning the firm around. He replaced 80% of the old management, brought in a new management team, moved the headquarters to his home city of Los Angeles, changed the name of the firm to AM International, and set out to redirect the firm's strategy. The first step in the new strategy was to modernize the existing mature technology products by the addition of new high tech controls. The second was to enter the emerging high tech segment of the industry by buying up young companies with promising new products.

The five years of Ash's control were chaotic. Typical of

the pattern of conglomerate behavior pioneered by Ash at Litton Industries, business units were acquired and divested at a rapid pace. Lacking strong financial resources, Ash was forced in his acquisitions to focus on small high-risk firms. For the first three years, total assets, debt, and net income were nearly flat, but in the last two years, debt rose rapidly and assets grew, but the growth was profitless. On February 20, 1981, after several months of private discussions, the board of directors held a special meeting to force Ash out and replace him with Richard Black. Black had managed a successful turnaround at the Maremont Corporation.

On taking over the firm Black instituted a thorough review of the finances and operations of AM International. He found that Ash had almost completely ignored operations of the firm, except for rapidly turning over operating managers. Old lines of business were still declining, and new ventures were unprofitable and not integrated into a coherent corporate strategy. Lacking both cash flow from operations and long term financing, Ash had expanded short-term debt. More important than the actual bad state of the company's finances, the financial records had been deliberately falsified to cover up the true state of affairs. After the 1981 annual report was issued for the fiscal year ending July 31, 1981, Black and the board established an audit committee of outside directors and retained Arthur Anderson & Co. to review the firm's financial statement. That review led to downward revision of the firm's

income and net assets for 1981 by over $200 million dollars. As result of that review, Price Waterhouse & Co. was dismissed as auditors. Following the release of the restated 1981 annual report, a series of legal actions were instituted, both civil suits by investors and complaints by the Securities and Exchange Commission, against the company, individual officers and directors, and Price Waterhouse.

After one year as CEO, Black resigned and filed suit against the firm, Roy Ash and other individuals, and Price Waterhouse & Co., alleging misrepresentation in connection with his employment and purchase of 300,000 shares of AM International stock. He was succeeded by Joe. B. Freeman. On April 14, 1981, fourteen months after Ash's departure and two months after Black's departure, the firm filed for bankruptcy.

Prebankruptcy Financial Performance

Tables B1.1 and Figure B1.1 provide the basic prebankruptcy financial performance information. The stock price behavior of AM International bore little relation to financial performance, but rose and fell on Roy Ash's reputation. Stock that had sold as high as $90 a share in 1968 had fallen to $3 before Ash became CEO. After Ash became CEO, stock prices rose to the $15-33 range, with no significant increase in earnings. In 1981, as Ash's promised turnaround failed to materialize, stock fell back to $4, and rose $3 the

day his ouster was announced. In 1982, after the bankruptcy announcement, the stock declined to below a dollar a share, but later in the bankruptcy period the stock traded in a range of $2-8.

The AM International case reflects several of the difficulties in bankruptcy classification and prediction. For the first four years of the six-year study period, AM International exhibited a relatively strong balance sheet with moderate debt, but its profits and cash flow were very weak. During those four years, the bankruptcy prediction models did not indicate imminent bankruptcy, but the Z-scores were in the high range of Altman's gray area. In 1980, the new Z-scores fell below the cutoff, but the Altman Z-score remained above the cutoff. In the final year, 1981, the scores fell precipitously as the firm collapsed. The 1981 prediction result was the same whether the original or restated financial statement data were used in the calculation, but the restated data gave a lower Z-score. AM International and its auditors considered restating results for years before 1981, but decided not to, although they acknowledged that the results were probably inflated. Commercial data services were inconsistent in the extent to which original data were adjusted for subsequent restatements by the firm. In this case, the distortion of financial results was deliberate and major, but there are indications that similar problems occur in many bankruptcies. In most instances, the suspect data are never

revised, nor the distortions publicly acknowledged. Probably cases in which there is deliberate fraudulent reporting are outnumbered by cases in which legal, but irregular, accounting devices are used to postpone bad news.

Bankruptcy Proceedings and Outcome

AM International filed for bankruptcy on April 14, 1982, shortly after the announcement that the annual report for the fiscal year 1981 had overstated the firm's net income and net assets by $203 million. At that point the firm had a negative net worth of about $84 million dollars, but the major businesses of the firm were operationally stable, and significant steps were already underway to turn the firm around. In 1983 and 1984, the two years that the firm was in bankruptcy proceedings, the firm was profitable, although revenues were below prebankruptcy levels.

The bankruptcy reorganization plan was approved in September 1984. All secured and priority claims were settled in cash, and unsecured creditors were paid $174 million in cash on $250 million in claims. Some of the cash was raised by terminating the existing defined benefit pension plan and establishing an ESOP (Employee Stock Option Plan). Prebankruptcy common stock, about ten million shares, was cancelled and replaced by about forty million shares of a new issue. Unsecured creditors were given 53% of the new stock as

compensation for claims not paid in cash. Old stockholders got about 25% of the new stock, based on a one-for-one exchange for old stock. The remainder was held for the ESOP, executive incentive plans, disputed claims, and other corporate purposes. By 1985 the new stock was selling in a range of $2.5-6 per share, and more recently in the $4-8 range. At those prices, unsecured creditors, who had received approximately one share for every $4 of claims, suffered little loss. The outcome for common stockholders depended on when they had bought their stock, as the price had ranged from a low of $0.75 in 1983 to a high of $92 in 1968.

Since emerging from bankruptcy in 1984, AM International has prospered and grown. In addition, it has benefitted from large tax carryforwards. In 1986 AM International acquired Harris Graphics Corporation, which moved AM International over the billion dollar mark in sales.

Managerial Turnover

Much of the top management of Addressograph-Multigraph, the corporate name of AM International at that time, was replaced in in 1970, when C. L. Davis became President and CEO. Little progress was made during his tenure, and in 1976, as recounted above, the Board recruited Roy Ash to lead a major turnaround effort. Ash pursued an aggressive program of new product development, largely through a series of acquisitions.

While his efforts led to growth in product scope and sales, his tenure was marked by financial and managerial chaos, and he was summarily dismissed in 1981.

Ash was replaced by Roy Black, who had developed a reputation as a turnaround specialist at Maremont Corporation. Black brought with him Joe. B. Freeman, as his chief financial officer. Jean Allard, an influential member of AM International's had also served as member of Maremont's board. As recounted above, Black first moved to straighten out AM International's financial records. On discovering the major overstatements of performance during the Ash administration, Black resigned and sued AM International for breach of contract of his employment agreement, a suit ultimately settled for $1.7 million.

Black was replaced by Freeman, his chief financial officer and former colleague at Maremont. Freeman was CEO when AM International filed for bankruptcy in April, 1982. Within a year, under Freeman's leadership, AM International returned to profitability and developed a reorganization plan. In spite of his success, Freeman was forced to resign in January of 1984, several months before the execution of the reorganization plan. By his own assessment and that of others, Freeman was an excellent financial planner, but weak on human relations skills. He failed to develop subordinate loyalties and alienated key members of the Board.

Freeman was replaced by Merle H. Banta, a member of the Board and CEO of a small California firm. The announced justification for the replacement of Freeman by Banta was that in the postbankruptcy period financial strength and experience would be less important than strategic planning and marketing skills, areas in which Banta was believed to be strong. Banta completed the reorganization in September 1984 and has continued as CEO since that time.

Discussion

The evidence from the AM International bankruptcy would appear to support a number of potentially conflicting judgments. At the beginning of the study period, the firm was clearly in decline in an industry in which dramatic changes in technology were taking place. The necessity of a turnaround, if the firm was to survive, was clear. Although classified in this study as a firm with declining sales in a growing industry, the firm grew on an inflation-adjusted sales basis every year, except the last year before bankruptcy.

The turnaround at AM International was underway when the audit that revealed the distortions in the 1981 annual report was reported. Had that shock not occurred, AM International might have been able to recover without resorting to bankruptcy. The transformation of AM International that took

place after Roy Ash's departure followed in large measure Ash's strategy in terms of objectives, but not in operations. The traditional mechanical technology was updated and new electronic and computer-based products were introduced as Ash had planned. What was changed was organizational structure and operational controls. Numerous small units were either sold off or incorporated into larger units. Cost controls were instituted and management overhead reduced. The moving of corporate headquarters from Los Angeles to Chicago after Ash was dismissed had symbolic as well as practical implications, just as Ash's move from Cleveland to Los Angeles had when he took over.

The history of AM International can be seen as an example of the successful use of bankruptcy, one in which little value was destroyed, a firm was revitalized, and bankruptcy costs were minimized. It could also be argued that the turnaround could just as well have been completed without the disruption and cost of the bankruptcy process.

Appendix B2

BRANIFF INTERNATIONAL AIRWAYS

Summary

Founded 1930. Single business in air transport.

Failure pathway: Growing sales in a growing industry.

Bankrupt 1982. Assets $1008M. Exchange NYSE.

Reorganized 1983. Assets $69M. Exchange OTC.

Figure B2.1

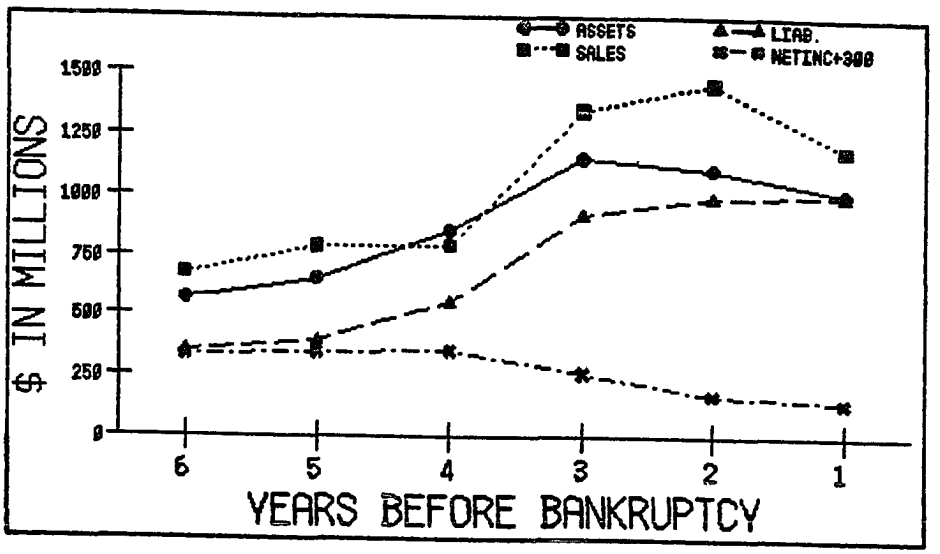

Table B2.1

Braniff International Corporation
(Bankruptcy Year: 1982)

			years before bankruptcy					
			6	5	4	3	2	1
Total Ass.	mil	$	572	655	855	1135	1107	1008
Sales	mil	$	680	791	972	1346	1452	1189
Net Inc.	mil	$	26	36	45	-44	-131	-161
Common Eq.	mil	$	189	220	250	199	66	-94
Liab.	mil	$	345	385	554	918	994	996
Stock Price		$	10.88	9.63	12.75	8.50	5.00	2.25
ROI		%	4.61	5.56	5.29	-3.91	-11.87	-15.93
Z			2.22	2.22	2.02	1.29	.91	.44
NZ5V			1.15	1.12	.99	.38	-.14	-.74
NZ2V			1.33	1.31	1.19	.61	.10	-.54

Historical Background

Braniff Airways was founded in 1930 by Thomas E. Braniff in Oklahoma City,where it remained until it moved to Dallas, Texas in 1942. Originally a regional carrier, Braniff played a major air transport role in World War II, and during that period began its expansion into Latin America. After World War II, Braniff expanded until by 1980 it served most of the fifty states, including Alaska and Hawaii, and overseas destinations from Hong Kong to Paris. Its domestic service was centered on its Dallas-Ft. Worth base, but it also had major gateways to Latin America from New York and Miami, and to Europe from Boston.

Industry Factors

During the formative years prior to 1938, competition in the airline industry was chaotic with occasional intervention by government agencies. By 1938 air transport had become recognized as a major national resource, with mail service then at least as important as passenger service, and the Federal government established a new regulatory agency for commercial air transport, the Civil Aeronautics Board (CAB). In 1978, as part of a larger public policy shift to deregulation, Congress passed legislation abolishing the CAB and most of its regulatory functions. Deregulation and return to free competition was scheduled to take place over a period of years

ending January 1, 1985, a schedule that was maintained. The Civil Aeronautics Board, which for forty years had been the Federal regulatory agency for commercial air transport, was phased out, but the Federal Aviation Administration, which regulated air safety and helped to support ground services, was retained.

In addition to deregulation, the airline industry was buffeted by rapidly rising energy prices, a shift from propeller to jet-powered aircraft, and environmental concerns over noise and other adverse environmental effects. Expansion of airports and supporting facilities was proceeding more slowly than the growth in air traffic. Added to these ongoing problems was the air controllers' strike of 1981, which led to their wholesale firing by the Reagan administration. The rebuilding of the air control system following the strike has hurt all the airlines down to the present time.

The end of regulation led to chaotic competition in the industry, as old lines expanded, new lines were started, and price became the dominant competitive factor. Computerized reservation systems and hub-and-spoke flight schedules contributed to the changing technology of the industry. Labor costs had been kept high by union agreements prior to deregulation, but had not been of much competitive importance as the wage standards were largely industry-wide and had been treated as fixed costs by the CAB in rate setting. After

deregulation, several of the new entrants in the industry were nonunion, low wage firms, which enjoyed a major cost advantage. The generally depressed character of the industry was reflected in overall net losses for 1981 and 1982. Mergers, acquisitions, and bankruptcies were characteristic of the industry during this period.

Firm Factors

Under CAB regulation there were three major industry segments: high density intercity routes, noncompetitive service on less travelled routes, and international routes. Airlines were classified by the CAB as "major" airlines, those serving the entire nation or large portions of it with primary focus on the competitive intercity routes; "national" airlines, which were more limited in their coverage and primarily operated in noncompetitive markets; or "regional," frequently known as commuter airlines. Braniff was classified as a "major" airline, but it was much smaller than the giants, American, Delta, Eastern, TWA, and United, and a considerable portion of its revenues came from its noncompetitive regional routes.

In 1965 Harding Lawrence moved from Continental Airlines to Braniff and immediately began a corporate campaign to move Braniff from a small regional airline into a national giant. In the period from 1965 to 1978, the Braniff strategy was highly successful. Operating revenues increased every year,

rising from $134.8 million in 1965 to $972.1 million in 1978. Growth in net income was less steady, but it grew from $9.4 million in 1965 to $45.2 million in 1978.

The most important immediate effect of deregulation for Braniff was a decision by the CAB to allocate approximately 1300 routes they had identified as commercially feasible, but which were not currently assigned, to the airlines on a first come-first served basis. The CAB added a provision that the airlines had to begin service on the new routes within a very limited period of time if they wished to enter those markets. For Lawrence this appeared to be the "window of opportunity" for which he had been preparing Braniff for over a decade. Apparently he also believed that deregulation would not last and that the window would be open for only a short time. Braniff applied for more than 400 of the new routes and began to implement the largest one-year expansion of airline service by a single company in the history of the industry. Braniff rushed into service with newly hired employees and with leased planes and facilities while placing huge orders for new planes. It did not take long for Braniff to recognize that it was in deep trouble. The Airline Deregulation Act was signed in October of 1978 and by December of that year Braniff had a major portion of its expansion underway. The first two quarters of 1979 were profitable, but in the third quarter, normally a good quarter in a seasonal industry, Braniff lost about $10 million and ended the year with a loss of $44

million.

In 1980 the public awareness of Braniff's financial situation grew with banks cutting off lines of credit and Standard and Poor's lowering their bond rating. Braniff attempted with limited success to lease or sell aircraft to augment its cash flow. Service was cancelled or reduced on many routes, particularly the newer international routes to the Far East and Europe. In late 1980 Braniff arranged a restructuring of its long-term debt with the banks and insurance companies in exchange for putting up a large share of its planes and other equipment as collateral. Losses in 1980 came to $129 million, and the auditor's report for the year carried a warning that Braniff might not be able to continue as a going concern.

In 1981 the decline accelerated with each new attempt to recover creating new losses. With declining customer confidence and increased price competition in the industry, Braniff cut fares, which further reduced income. Domestic flights were reduced and more planes leased. Passenger miles fell by 25% in 1981 compared to 1980. The air controllers' strike in the summer of 1981 caused additional problems. With their new collateral the banks were less threatening in the first half of the year, but by September the pressures were on again. Braniff negotiated deferrals of principal payments and forgiveness of some interest with its bankers, but it was

forced to increase its mortgages on its remaining unpledged property. Losses in 1981 increased to $161 million, up from $131 million in 1980.

Prebankruptcy Financial Performance

Table B2.1 and Figure B2.1 provide the basic financial performance information. As indicated on those tables and the descriptive section above, Braniff's profitability ended with deregulation and further declined thereafter. Typical of many failing firms, Braniff followed a growth strategy based on debt. Assets and sales grew at high rates, but the growth came at the expense of profits. Airlines are particularly vulnerable to profitless growth because their fixed costs are high on two separate factors. The first is the capital cost of airplanes, whether they fly or not. The second is the high cost of flight operations independent of passenger loads. Labor, fuel, and landing rights costs are nearly independent of the number of paying passengers on a plane. All airlines tend to be similarly affected by seasonal and cyclic demand, which intensifies competition. Under regulation, fare competition was not an important competitive weapon, but beginning in 1979 deregulation opened the door to fare wars. The problems were compounded by industry inexperience with price competition. Braniff's problems were more severe than those of most other airlines, in part because of its rapid growth, and in part because many of its new market entries were available only

because they had not been considered economically viable under regulation.

In 1972, before the deregulation debate began, Braniff shares sold as high as $19.63 per share on earnings of $0.85 per share and no dividends. In spite of increasing per share earnings and and the initiation of a dividend, stock prices fell sharply until 1975, hitting a low of $4.50 per share in 1974. In 1978 stock prices rose to $18.63 on record earnings of $2.26 per share and dividends of $0.345. In 1981 stock prices fell to $2.00 per share, and in 1982 the stock became almost worthless, selling as low as $0.19 per share.

The bankruptcy prediction scores closely tracked Braniff's financial decline, with all three prediction models giving closely parallel results. Airline Z-scores are typically low, as airlines are capital intensive, and high debt strategies are common. The high rate of airline bankruptcies, even under regulation, confirms the appropriateness of the low Z-scores. The Z-scores also are good indicators of reorganization value. Braniff's final scores were much lower than those of Continental Airlines, which followed Braniff into bankruptcy in 1983. Braniff had a very low bankruptcy payout and was reorganized with less than ten per cent of its prebankruptcy assets. Continental repaid its creditors in full and emerged from bankruptcy larger than it went in.

Bankruptcy Proceedings and Outcome

By January of 1982, bankruptcy plans were beginning to be discussed. Braniff agreed to lease its South American operations to Pan American, but the arrangement was rejected by the CAB on monopoly grounds, since Pan American was one of Braniff's chief competitors in that region. A hasty switch to sell the lines to Eastern came too late to help. In March a payroll was missed, and as the situation continued to deteriorate, more and more suppliers began to demand cash in advance for fuel and other supplies. Travel agents, who are responsible for 70-80% of all airline ticket sales, shifted traffic away from Braniff until, at the end, those sales had been cut in half. The end came on May 13, 1982, when Braniff International, Inc., Braniff Airways, Inc., and Braniff Realty, Inc. all filed bankruptcy petitions and closed down all operations.

The estimated claims against Braniff totalled $1256 million dollars against an estimated liquidation value of about $475 million. The secured creditors were faced with the most difficult decision. If the firm was liquidated, they could claim essentially all the proceeds left after the priority claims were paid, but their estimated payout was substantially less than their claim. For all lower priority classes, reorganization offered at least the hope of some return, which liquidation did not. The reorganization plan adopted was a

compromise between total liquidation and reestablishment of the business. The firm was perpetuated, but most of the assets were sold to pay off creditors.

Table B2.2 shows the approximate distribution of the Braniff assets. The settlement was complicated by imbalances in the claims and assets between separate Braniff units. Creditors of the corporate holding company fared somewhat better than the creditors of the airline operating subsidiary, which was by far the largest entity. Only the small priority claimant classes received full settlements. Even the secured creditors received less than full settlements, and much of those were tied up in a slow asset liquidation plan. Large amounts of new stock were issued with only token amounts going to the original stockholders. The new stock was broken up into a complex mix of common and preferred with varying voting and liquidation priorities. None of the stock had immediate market value, and future values were highly speculative.

Braniff filed for bankruptcy with a declaration of intention to reorganize and resume operations as a going concern. There were no legal barriers to its continuing operation in bankruptcy, but Braniff had neither a plan nor the resources for a quick resumption of business. As a result Braniff, never resumed its flight operations, and only some very small contract ground operations were continued. For all practical purposes, Braniff was closed down throughout the

Table B2.2

Braniff Bankruptcy Settlements

Claimant Class	Claims ($ in millions, shares in thousands)	Settlements	
Administrative	$ 16	Cash	$ 15
Priority Wages	$ 18	Cash	$ 18
Taxes	$ 6	Cash	$ 6
Mechanics' Liens	$ 2	Assets	$ 2
Senior Creditors	$467	Cash	$ 25
		Assets	$ 319
		Pref.Stock	950 sh.
		Warrants	526 sh.
Unsecured Creditors	$700	Cash	$ 3
		Pref. Stock	1,750 sh.
		Com. Stock	1,164 sh.
Pref. Stockholders	$47	Com. Stock	60 sh.
Com. Stockholders	21,000 sh.	Com. Stock	170 sh.
Reorganized Braniff		Cash	$ 28
		Assets	$ 58
Total	$1,256	Cash	$ 96
		Assets	$ 379
		Pref. Stock	2,700 sh.
		Com. Stock	1,394 sh.
		Warrants	526 sh.

bankruptcy period. Planes, airport gates, and other assets were mothballed at considerable ongoing expense and continuing depreciation.

There was no consensus on the part of the creditors about reorganization. In particular, the public bondholders believed their best interests would be served by complete liquidation. More generally, the financial and operating condition of Braniff had been allowed to deteriorate so badly that it was not able to reorganize with its own resources, and it was not an attractive opportunity for outside investors.

Before the bankruptcy Braniff had been negotiating with other airlines about possible mergers or joint ventures of some type, but nothing was accomplished. After bankruptcy the talks continued, but no agreements were reached. After nearly a year of unsuccessful attempts to reorganize its flight operations, Braniff initiated a plan to sell all its planes to Texas Air, Inc., and to resume business as a very small ground maintenance operation. This plan had little to offer to creditors and was dropped.

After more than a year of unsuccessful attempts to reorganize, the Hyatt organization was induced to capitalize the reorganization of Braniff as a an airline about one-tenth of its original size. Hyatt was a group of corporations

Corporation, which operated the Hyatt hotels, but there were a variety of other businesses. The Pritzker family had large financial resources and a reputation for entrepreneurial undertakings. One of the major incentives for the Hyatt investment in Braniff was the potential value of Braniff's $347 million tax loss carryforward, which could be used by the Pritzkers to shelter income in their other businesses. The negotiations with Hyatt were difficult with the senior creditors turning down several early proposals by the old management and Hyatt. Later haggling over the details of the lease of planes by the Liquidating Trust to New Braniff delayed the completion of the reorganization. Finally, in July of 1983, with Bankruptcy Court-established time deadlines running out, a definitive agreement was reached and approved. The final Bankruptcy Court settlement came in September 1983.

With these actions complete, the Braniff holding company changed its name to Dalfort Corporation. Dalfort retained the ground service and leasing businesses of old Braniff and organized Braniff, Inc., a new subsidiary, to resume airline operations. Braniff, Inc. was rechartered in November 1983 as a Nevada corporation. The start-up for the new airline was scheduled for March 1, 1984. Braniff had three major assets in the start-up, the capital provided by Hyatt, a favorable lease for thirty planes provided under the bankruptcy agreement, and an experienced work force eager to get back to work. The basic strategy for the new airline was based on superior quality

service at regular coach fares and low costs. The new operation retained the old union affiliations, but with substantial wage concessions. Since reorganization, Braniff has pursued a number of different strategies, but none has been profitable. Too small to compete effectively in the industry, it survives, but there is evidence to suggest that financial considerations, including asset liquidation values, potential mergers, and tax benefits, have more to do with the delay in bringing the final dissolution of Braniff than any hope of making the undertaking successful.

Managerial Turnover

Leadership of Braniff changed twice in two years during Braniff's decline. At the end of 1980, Harding Lawrence, who had guided Braniff's expansion for a decade, resigned at the request of the Board. The primary pressure for Lawrence's resignation came from banks and insurance companies that had the power to cut off essential funding. He was replaced by John J. Casey, a Braniff Vice President with a background in operations, but little experience in finance or marketing. He was selected primarily on his ability to deal with the unions. The Board did not have full confidence in Casey and stipulated that he would consult the Board on all important decisions.

Under Casey's leadership Braniff continued to decline. In September 1981, Howard Putnam was hired by the Board as

President and Chief Operating Officer, leaving Casey only a limited, largely ceremonial role. At the time, Putnam was serving as President of Southwest Airlines, a smaller, but highly profitable regional competitor of Braniff's in Texas. Putnam brought with him his chief financial officer, Phillip Guthrie. In January 1982, Putnam was made Braniff Chief Executive Officer, a position he held until the bankruptcy proceedings were complete. John Casey resigned in March of 1982 to take an executive position at Pan American Airways.

Putnam carried the primary responsibility for the reorganization of Braniff. Since Braniff had discontinued all of its flight operations and most of its related ground activities, Putnam was able to direct all of his efforts toward management of the bankruptcy and reorganization. However, Putnam had little success in finding support for a full-scale reorganization. His lack of success led other players to pursue independent reorganization plans. Apparently without the knowledge of Braniff's management, two retired Braniff pilots made an approach to Hyatt Corporation to finance the restoration of the airline. An earlier attempt by management to get Hyatt participation in the reorganization had been unsuccessful. The pilots' intervention led to further discussions between Braniff and Hyatt, which culminated in Hyatt's agreement to finance the reorganization. Hyatt was a group of corporations controlled by the Pritzker family. Jay Pritzker, the leading family member in the Braniff

reorganization, became Chairman of the Board of Dalfort, the new holding company, and Braniff, Inc., the new airline corporation. His brother and son became board members. The Pritzkers then recruited William D. Slatterly, Vice President-International Division of Trans World Airlines, to serve as President of the new Braniff, Inc.

Discussion

The Braniff bankruptcy scenario was consistent with the general findings in the study. Its decline was rooted in the external stress of airline deregulation. Based on the faulty assumption that deregulation would be a temporary phenomenon, the management undertook a rapid expansion funded by nearly tripling the debt level. The operating organization was incapable of making effective use of the expanded asset base and profits declined. Braniff rationalized the continued unprofitable expansion on the belief that this a a once-in-a-lifetime "window of opportunity" that would slam shut with the return to regulation. Mismanagement of operations and bad employee relations compounded the problem.

The decline continued until liabilities exceeded assets by half a billion dollars. Chaotic operations had driven customers away to the point that there was little demand and few resources. Shutting down operations on filing for bankruptcy is generally a weak reorganization strategy, but in

this case it probably didn't make any difference.

The reorganization process was marked by high levels of conflict, with bondholders suing mortgage holders over prebankruptcy priority manipulations, and other claimants suing on lesser issues. The reorganization plans resulted in a successor much reduced in size, burdened with debt and little hope of profitability. It was driven by tax loss carryforwards, managerial pride, and a flood of speculative stocks. In no other case studied was so much wealth squandered so quickly in the failure process. It remains a classic example of how not to manage decline and reorganization. In Braniff's defense it should be noted that it suffered from an uncertain environment brought on by airline deregulation and the revision of the bankruptcy code, both adopted in 1978.

Appendix B3

CONTINENTAL AIR LINES INC.

Summary

Founded 1934. Controlled and substantially owned by Texas Air Corp. since 1982.

Single business in air transport.

Failure pathway: Growing sales in a growing industry.

Bankrupt 1983. Assets $843M. Exchange NYSE.

Reorganized 1986. Assets $1159M. Exchange ASE.

Figure B3.1

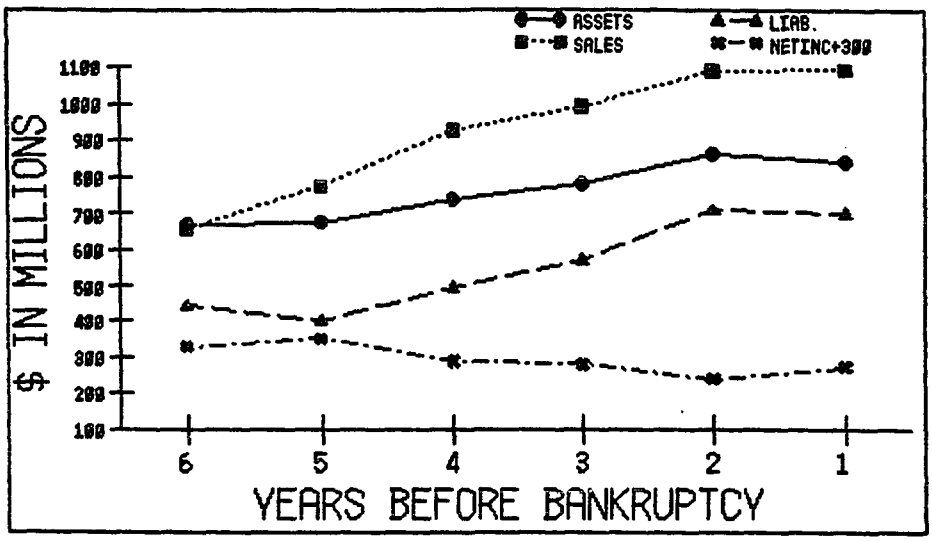

Table B3.1

Continental Airlines
(Bankruptcy Year 1983)

		years before bankruptcy					
		6	5	4	3	2*	1*
Total Ass.	mil $	670	677	739	784	864	843
Sales	mil $	657	775	928	992	1091	1094
Net Inc.	mil &	26	49	-13	-21	-60	-27
Common Eq.	mil $	179	229	213	191	131	114
Liabil.	mil $	444	401	496	575	710	704
Stock Price	$	9.50	8.75	10.00	11.00	4.38	6.13
ROI	%	3.83	7.26	-1.79	-2.64	-6.99	-3.22
Z		1.52	1.78	1.53	1.33	.75	1.21
NZ5V		.59	.79	.59	.44	-.18	-.02
NZ2V		.78	1.04	.86	.71	.25	.16

The data shown were taken from the Compustat files. Data from other sources may differ depending on the accounting treatment of transactions associated with the acquisition of Continental Airlines by Texas Air Corporation in 1982.

Historical Background

Continental Airlines' history goes back to the incorporation of Varney Air Transport in Nevada in 1934. In 1937 the firm was taken over by Robert F. Six and renamed Continental Airlines, Inc. Robert F. Six, son of a Los Angeles plastic surgeon and a high school dropout, became one of the legends of commercial aviation. Always an adventurer, he learned to fly in 1929 and established a one-airplane air service, which went bankrupt during the depression. He then went to China to help in the establishment of air service there. When he returned in 1937, he borrowed money to buy a controlling interest in Varney, then called Varney Speedlines. Six was always something of a larger-than-life figure. A physically big man, he enjoyed playing the Western cowboy role, was married to a series of wealthy, famous women, and was a promoter of the airline industry. Six strongly opposed the deregulation of the airline industry during the political debate which led to the Airline Deregulation Act of 1978, predicting that competition would lead to declining standards of service to passengers. Six had a reputation as a hands-on-manager who was involved in every detail of the business.

Like all airlines of that period, Continental remained small until after World War II. From revenues of less than $10 million in 1950, Continental went to $61 million in 1960, and

to $289 million in 1970. Later data on an annual basis are displayed in Table B3.1, and the story of the decline and bankruptcy is provided in a subsequent section.

Industry Background

During the five-year period prior to Continental Airlines' bankruptcy, 1977-1982, the airline industry was undergoing tremendous change. In 1978 Congress passed the Airline Deregulation Act of 1978, which provided for a gradual elimination of regulation of fares and routes and of subsidies for services to smaller communities with low traffic volume. Deregulation was scheduled to be complete by January 1, 1985. The Civil Aeronautics Board, which for forty years had been the Federal regulatory agency for commercial air transport, was phased out, but the Federal Aviation Administration, which regulated air safety and helped to support ground services, was retained.

In addition to deregulation, the airline industry was buffeted by rapidly rising energy prices, a shift from propeller to jet-powered aircraft, and environmental concerns over noise and other adverse environmental effects. Expansion of airports and supporting facilities was proceeding more slowly than the growth in air traffic. Added to these ongoing problems was the air controllers' strike of 1981, which lead to their wholesale firing by the Reagan administration. The rebuilding of the air

control system following the strike has hurt all the airlines down to the present time.

The end of regulation led to chaotic competition in the industry, as old lines expanded, new lines were started, and price became the dominant competitive factor. Computerized reservation systems and hub-and-spoke flight schedules contributed to the changing technology of the industry. Labor costs had been kept high by union agreements prior to deregulation, but had not been of much competitive importance as the wage standards were largely industry-wide and had been treated as fixed costs by the CAB in rate setting. After deregulation, several of the new entrants in the industry were nonunion, low wage firms, which enjoyed a major cost advantage. The generally depressed character of the industry was reflected in overall net losses for 1981 and 1982. Mergers, acquisitions, and bankruptcies were characteristic of the industry during this period.

Firm Factors

At the time of deregulation and the beginning of the study period for this research, Continental Airlines had a route structure that was concentrated in the Southwest, but extended to Chicago, Miami, and Seattle in the continental United States, and to Alaska, Hawaii, Australia and Japan in the Pacific basin. In the twenty years prior to deregulation,

Continental Airlines had been profitable every year except 1975. That was the year that CAB approvals of rate increases failed to keep pace with rapidly rising fuel prices following the Arab oil embargo. A 25-day strike in 1976 led to a loss in the fourth quarter, but not for the year as a whole.

Following deregulation, Continental, unlike Braniff and some other competitors, did not undertake an aggressive expansion program. Inflation, the use of larger planes, and modest expansion kept revenues on the increase, but intense price competition and the inability to cut labor costs resulted in losses in 1979 and every year thereafter.

In the first two years of deregulation, nearly all the airlines lost money. For the strong major airlines, such as American, United, and Delta, the losses were not life-threatening. However, a second tier of airlines, including Continental, Texas Air, Western, and Braniff, lacked the resources to survive sustained losses. This led to a number of merger discussions, including those between Continental and Western, and between Continental and Texas Air. In 1980, Texas Air approached Continental about a friendly merger, but any merger with Texas Air was rejected by both the management and employees of Continental. The friendly merger talks failing, in February 1981 Texas Air initiated a tender offer for shares of Continental and by the end of the year had gained control of a majority of the stock. Continental

actively resisted the takeover and pursued a number of defense strategies. The possible merger with Western Airlines fell through as Western declined to fight Texas Air. An employee stock option buyout was actively pursued, but the necessary financing was not obtained.

The Texas Air acquisition of Continental was achieved through a complex set of transactions. Texas International Airlines, the operating unit of Texas Air was merged into Continental, and Continental became a wholely-owned subsidiary of Texas Air. Texas International Airlines operations were consolidated with those of Continental under the Continental flag. Texas Air subsequently reduced its 100% ownership of Continental to 85%, but the two companies were operated under the same management.

After the merger, the financial situation continued to decline. In 1982 employees under union leadership accepted cost-cutting measures, but the amounts saved were inadequate. In 1983, management demanded additional large savings, but the union leadership rejected all offers, including offers to grant employees a major ownership stake in the firm. Texas Air was accused of using its complex financial structure to shift assets from Continental to Texas Air, a charge that has been made repeatedly both before and after this struggle. In the summer of 1983, with labor negotiations at an impasse, management gave the unions a deadline of September 19 to accept

the proposed contract changes. The deadline was not met, and on September 24 Continental Airlines and its related subsidiaries filed for bankruptcy.

Continental was so prepared for the bankruptcy that within a week after the filing and the dismissal of union employees, airline operations resumed. The unions and other creditors vigorously pursued court challenges to both the bankruptcy and the firings, but none was successful. Failing in legal actions, the unions undertook major public relations campaigns to discredit the airline. Continental used the opportunity to slash labor costs and undertake a price-cutting strategy. Revenue fell in 1983, but rebounded in 1984, and by 1985 exceeded prebankruptcy levels. In 1984 and 1985 Continental was profitable.

Prebankruptcy Financial Performance

Table B3.1 and Figure B3.1 provide the basic financial performance information. Even by airline standards, which tend to be highly leveraged and feature poor financial performers, Continental Airlines was in weak financial condition. Even in 1977 and 1978, prior to airline deregulation and when Continental was profitable, Continental was in poor cash position as indicated by negative values for X1, the ratio of working capital to total assets. Stock prices were consistently below book value, another indicator of financial

weakness.

The financial characteristics of Continental were exceptions to the general patterns observed in this research. Unlike most other firms with growing sales in a growing industry, the rate of decline was slow. All the bankruptcy prediction models had scores in the bankrupt range in all six years prior to the actual bankruptcy. On the basis of several indicators Continental's financial situation was improving when it filed for bankruptcy. Continental was probably not bankrupt under the standard financial definitions when it filed for legal bankruptcy. The legal bankruptcy was sought on the basis that the labor contracts under which it was operating would drive the firm into bankruptcy if it could not breach those contracts.

Bankruptcy Proceedings and Outcome

Continental Airlines Corporation filed for bankruptcy under Chapter 11 of the Bankruptcy Code on September 23, 1983. As of December 31, 1983, the first audited evaluation of bankruptcy obligations, bankruptcy liabilities were $738 million, and the stockholders' equity deficit was $109 million. With a loss for 1983 of $150 million, it is difficult to determine exactly whether Continental was technically bankrupt as of the filing date.

During the bankruptcy period Continental not only continued its operations, but expanded them. Labor conflict was intense throughout the period as Continental arbitrarily cancelled labor contracts, hired nonunion employees and terminated its defined benefit pension plan. The cancellation of the labor contracts was contested in the courts, but management's actions prevailed both in the Bankruptcy Court and the regular Federal court system.

Continental's reorganization plan was filed on February 26, 1986, approved by the Bankruptcy Court on June 30, and completed by September 1. The plan provided for payment in full of all creditor claims and retention of ownership by the stockholders. Part of the creditor payments were made in cash with the remainder to be paid with interest over time. Deferred payments were guaranteed by Texas Air, which owned 85% of the outstanding stock, in return for an additional 100,000 shares of Continental stock. Although creditors nominally received full payment for their claims, there were significant losses for them. Only 3% interest was paid on unpaid claims prior to the completion of the reorganization plan, and the indirect costs associated with the pursuit and collection of claims were substantial for many creditors.

Evaluation of outcomes for individual stockholders is difficult since 85% of the stock was owned by Texas Air, which controlled the company and made all the bankruptcy decisions.

Continental stock had sold between $4.38 and $11.00 in the years prior to bankruptcy. Texas Air had purchased much of its stock at $13 in its 1981 tender offer, and acquired the remainder in exchange for Texas Air stock and debt. Texas Air subsequently reduced its stake to 85% by selling Continental stock. Texas Air's stake was further reduced to 74% by employee stock option plans. The publicly traded stock declined immediately following the bankruptcy filing, but soon recovered. In 1987 Texas Air acquired all the outstanding stock of reorganized Continental for about $16 per share, with small differences between prices paid to employees and public holders.

Managerial Turnover

There was an almost complete turnover in executive level management at Continental Air in the prebankruptcy years, but the turnover was not directly related to the bankruptcy, although both the managerial turnover and the bankruptcy were rooted in the decline at Continental Air and its takeover by Texas Air under the leadership of Frank Lorenzo.

Frank Lorenzo had entered the airline industry in 1971 when he manipulated a consultancy at Texas International into a controlling interest and a chief executive position. Lorenzo directed a successful turnaround at Texas International prior to the deregulation of the airlines in 1978. Following the

deregulation of the airlines, both Continental and Texas International Airlines fell into serious financial difficulties. Lorenzo made Texas International the major operating unit of a new corporation, Texas Air Corporation, and using Texas Air as a base, Frank Lorenzo began to search for acquisitions.

In 1980 Frank Lorenzo had approached Robert Six about a friendly merger with Continental Airlines, but any deal with Texas Air was rejected by both the management and employees of Continental. Management sought to retain their autonomy, and employees feared Lorenzo's strong antiunion position. The friendly merger talks failing, in February 1981 Lorenzo initiated a tender offer for shares of Continental and by the end of the year had gained control of a majority of the stock.

At the same time that the takeover battle between Texas Air and Continental was going on, Continental was undergoing a management crisis. Speculation and maneuvering about a successor to Robert Six, who had run Continental since 1937, had been going on for more than a decade. Harding Lawrence, who had come to Continental when Continental acquired Pioneer Airlines in the mid-1950s, was an early possibility, but he moved to Braniff in 1965, where he became the central figure in the Braniff bankruptcy. In 1980 Six hired Alvin Feldman away from Frontier, another future bankruptcy victim, to become his replacement. Feldman led the fight against Lorenzo in the

takeover struggle. In August 1981 Feldman, despondent over the death of his wife and and his failure to prevent the takeover, committed suicide in his office. He was succeeded by George Warde, another executive recently recruited by Six.

Neither Six or Warde played a significant role after the Texas Air takeover, as control shifted to Lorenzo and his associates. Six was offered a directorship at Texas Air, but he resigned after only a few months. Under Texas Air and Frank Lorenzo, financial and legal management were largely separated from airline operations. Airline operations were managed at Continental by a succession of technicians with strong industry reputations, but little public visibility. Financial and legal management was concentrated at Texas Air, with documents signed by Lorenzo subordinates and functionaries. In both areas there was no question that Lorenzo maintained a level of absolute control rare in large corporations today.

Discussion

Any discussion of the bankruptcy of Continental Airlines is complicated by the concurrent and inextricably comingled acquisition of Continental by Texas Air. Although the case was officially the bankruptcy of Continental, it was also the bankruptcy of Texas International Airlines which had been merged into Continental the previous year. For Texas Air the bankruptcy was a financial and operational success, but it left

a legacy of embittered unions and competitors. The animosity, largely directed personally at Frank Lorenzo, has grown as Texas Air has continued to expand with the acquisition of People Express, Eastern Airlines, and the remains of Frontier Airlines. Those expansions have been a driving force in the cut-throat airfare wars that have come to characterize the airline industry.

The Continental bankruptcy has had a major impact on bankruptcy law and thinking. Although not the first case in which bankruptcy was used to cancel labor contracts, it is the best known and most influential. It prompted legislation that reduced the freedom of firms to unilaterally abrogate union contracts, but preserved the possibility, subject to Bankruptcy Court approval. More generally, the Continental bankruptcy pointed to the use of bankruptcy as a strategic option and established the right of firms to use bankruptcy to react to potentially life-threatening liabilities before actually becoming bankrupt by traditional financial standards.

It is interesting to compare the Continental bankruptcy with that of Braniff. Braniff resisted the bankruptcy option until no other alternative was available. By that time Braniff was unable to resume operations during reorganization, and losses multiplied. In the end, Braniff was reorganized with only a small fraction of its prebankruptcy assets; creditors received only fraction of their claims; and stockholders lost

all but a token amount of diluted shares of minimal value. The lessons seem to have been learned as Wheeling-Pittsburgh Steel and LTV Corporation declared bankruptcy early and have maintained nearly full operations during reorganization.

Appendix B4

CROMPTON COMPANY, INC.

Summary

Founded 1807. Single business in textile production.

Failure pathway: Declining firm in a declining industry.

Bankrupt in 1984. Assets $97M. Exchange ASE.

Liquidated 1987.

Figure B4.1

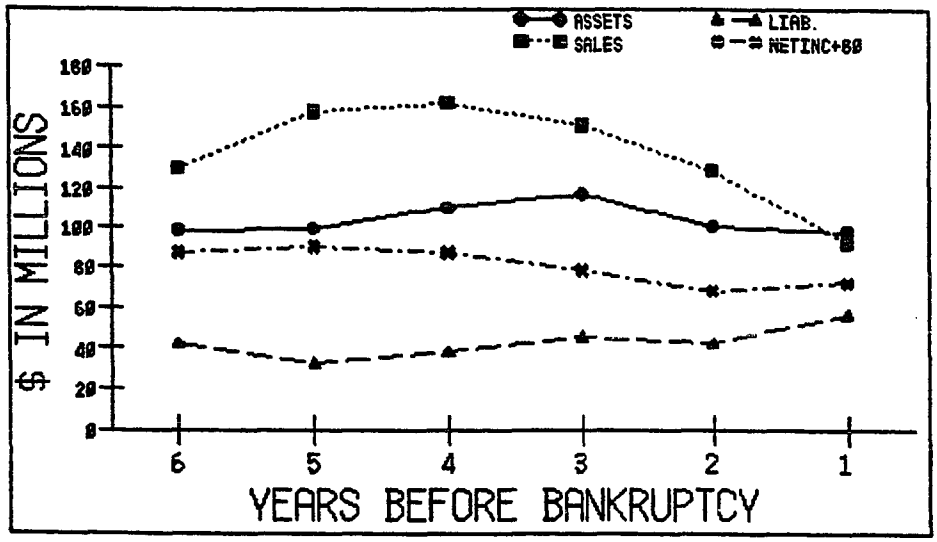

Table B4.1
Crompton Company, Inc.
(Bankruptcy Year: 1984)

			years before bankruptcy					
			6	5	4	3	2	1
Total Ass.	mil	$	98	99	110	117	100	97
Sales	mil	$	130	158	162	15	129	92
Net Inc.	mil	$	7	10	7	-2	-12	-8
Common Eq	mil	$	49	57	61	59	47	39
Liabil.	mil	$	42	33	38	45	42	56
Stock Price		$	22.75	28.88	21.63	13.63	10.63	15.88
ROI		%	7.51	9.91	6.29	-1.49	-12.05	-8.04
Z			3.35	4.08	3.51	2.71	2.50	1.61
NZ5V			2.01	2.55	2.27	1.86	1.62	1.35
NZ2V			2.00	2.61	2.30	1.88	1.64	1.39

Historical Background

Crompton was founded in 1807 and incorporated in Delaware in 1928. The company manufactured and marketed corduroy and velveteen, primarily cotton, but with some polyester blends. The product was considered to be of high quality and primarily sold to clothing manufacturers. The Company operated six plants in six Southern States. Corporate and sales headquarters were located in New York City.

Industry Factors

Corduroy and velveteen were traditionally relatively expensive materials with a limited range of uses. Although some corduroy was used for upholstery, the major use was in high quality sportswear. Velveteen was an even more specialized product, largely used in stylish clothing for women and children. During the Seventies, corduroy jeans became very popular and demand for corduroy rose sharply. Domestic capacity expanded to meet that demand and anticipated increases in export demand. Corduroy weaving requires specialized machinery, which at that time was not readily available in the underdeveloped countries which were low-cost textile producers. Prior to the widespread use of corduroy for jeans, corduroy was a premium material and price was not a major competitive factor.

Just as corduroy capacity expansion in the United States was nearing completion, the industry was hit by two blows. The demand for corduroy jeans declined, and imports of both corduroy yard goods and finished clothing began to rise dramatically. Deteriorating exchange rates exacerbated the import imbalance. At the same time, the demand for expensive casual clothing was declining. As a result, the domestic corduroy industry was left with a declining market for premium fabrics and was unable to compete with imports for the low-end yard goods and finished clothing. Exports dried up as foreign clothing manufacturers shifted to low-cost foreign suppliers of materials. From 1980 to 1984, domestic capacity was reduced by 40% by plant closings and product line shifts, about the same amount as had been added in the previous decade.

Velveteen, always a low-volume product, suffered similar reverses. High-priced velveteen clothing was out of fashion, both for adult women and children. In the low-priced velveteen clothing market segment, domestic producers could not profitably compete with imports.

Firm Factors

Crompton had two major weaknesses. Its product line was extremely narrow, limited to only two types of woven materials, corduroy and velveteen. As a result, it was limited in its ability to shift production and marketing to other product

lines. This specialization also meant that the firm had no other successful lines of business to sustain it during this period of decline in corduroy and velveteen.

At the beginning of the study period (1978-1983) Crompton was in the midst of an expansion program which brought sales from $63 million in 1974 to a peak of $162 million in 1980. A large new plant had been brought on line in 1974. Profitability peaked in 1979, declined slightly in 1980, and then fell sharply through 1983, the last year before bankruptcy. The intense price competition resulting from domestic overcapacity and foreign imports appeared to be more destructive than the decline in demand. In the end, Crompton was left financially weakened by a large capital investment which could not be profitably utilized.

In 1984 the firm showed modest improvement in sales, but continued to decline financially, forcing it to take desperate actions to survive. A $37.5 million debt restructuring was implemented, which allowed Crompton to meet its immediate obligations, but the overall effect was to increase long-term debt and shorten its maturity to less than two years. In addition the restructuring imposed a series of management controls. Agreements for factoring accounts receivable were revised to provide payments on an anticipation basis, but increased the cost of factoring. The defined benefit pension plan was terminated, freeing up about $6 million in cash.

Prebankruptcy Financial Performance

Table B4.1 and Figure B4.1 provide the basic financial performance information. Crompton's market performance was marked by low market-to-book ratios and low price earnings ratios. Stock prices tended to show wide annual high-low ranges. In 1983, in spite of declining sales and net losses in both 1982 and 1983, stock prices were higher than in 1982, an increase only partially explained by the stock market rally which began in late 1982. From January to October of 1984, the stock price fell from $16 to $9 per share, and was still selling for $4.50 per share in the third market when bankruptcy was declared on October 23, 1984.

Although Crompton's pattern of declining sales and declining profits appeared typical of failing firms, bankruptcy prediction models gave mixed results in predicting its bankruptcy. As indicated in Table B4.1, the new five-variable Z-score had declined from 2.01 to 1.35 during the five-year period prior to bankruptcy, but it remained well above the cut-off level of 1.0. The firm had relatively high retained earnings-to-total assets and market value-to-total liabilities ratios, the two most heavily weighted bankruptcy predictor variables. The high retained earnings reflected its long history as a successful firm. The market performance of Crompton's stock did not closely track the firm's business

performance. At the beginning of the study period, the stock price was low, only about 60% of book value, but it did not decline as quickly as the firm's profitability. The stock price performance and the failure of the bankruptcy prediction model are consistent with each other, and collectively suggest that the variables in the model represent firm attributes which are important to investors.

While both the five-variable and the two-variable bankruptcy prediction models developed in this study failed to predict the bankruptcy, the original Altman model prediction was correct one and two years prior to bankruptcy, and was right at the cutoff point three years out. Out of the 73 firms studied, Crompton was one of the very few cases in which the original Altman model outperformed the new models developed in this study. The Altman model places much heavier emphasis on operating income and asset turnover, both of which were weak and declining at Crompton, than the new models. It is also interesting to note that Crompton with its single business and relatively small size is more like the firms in the Altman sample than those in this study.

Bankruptcy Proceedings and Outcome

Crompton Company, Inc. filed for bankruptcy under Chapter 11 of the Bankruptcy Code on October 23, 1984. Liabilities were estimated at $43.5 million. Total assets had a book value

of about $70 million, but the going concern estimated value was only $30 million. Although the bankruptcy petition was filed under Chapter 11, it was with the stated intention of liquidating the firm. No buyer for the intact firm appeared, so the firm was liquidated by the piece-meal sale of plants, equipment, and other assets.

The liquidation was completed by 1987. The liquidation yielded about $45 million. Ongoing business expenses, including commissions to equipment and real estate brokers, consumed about $7 million. Direct bankruptcy administrative costs were just over $2 million, and brokerage fees averaged about 10% of asset sales.. Except for small priority claims, unsecured creditors received nothing. There was some litigation brought by the unsecured creditors' committee contesting the classification of some claims as secured, but the results were not substantial. Stock holders received no distribution.

Managerial Turnover

Managerial turnover was very low throughout the study period. William G. Lord II became CEO of Crompton in 1977, after previously serving as President. He had presided over the entire expansion, decline, and liquidation of Crompton. Other officers had similarly long tenures. Much of the responsibility for disposal of assets was given to independent

real estate and equipment brokers.

The general impression one gets from the available information is that of a firm that had little drive to reorganize and survive. The initial public announcement of the bankruptcy filing carried the firm's intention to liquidate and distribute the receipts to creditors. Lord took a salary cut from $240,000 per year to $120,000 during the reorganization, and some other officers also had their compensation reduced.

Discussion

The Crompton bankruptcy was a classic case of overexpansion of a firm based on estimates of future demand that never materialized. The industry situation was closely parallel to that of the firm. When the industry realized that the demand was not going to be there, or it would be filled by low-cost imports, a process of capacity reduction was begun. Crompton reduced its capacity by selling two older, less efficient plants, but the losses involved in the reduction and continuing high overhead costs produced increasingly large profit declines. International competition from low-cost producers of yard goods and finished goods and unfavorable currency rate shifts created additional difficulties for all firms in the industry. Unlike some of its less specialized competitors, the cumulative effects were fatal to Crompton.

Appendix B5

LIONEL CORPORATION

Summary

Founded 1901. Dominant business in retail toy stores, but also in electronics production.

Failure pathway: Growing sales in a declining industry.

Bankrupt 1982. Assets $222M. Exchange NYSE.

Reorganized 1985. Assets $112M. Exchange ASE.

Figure B5.1

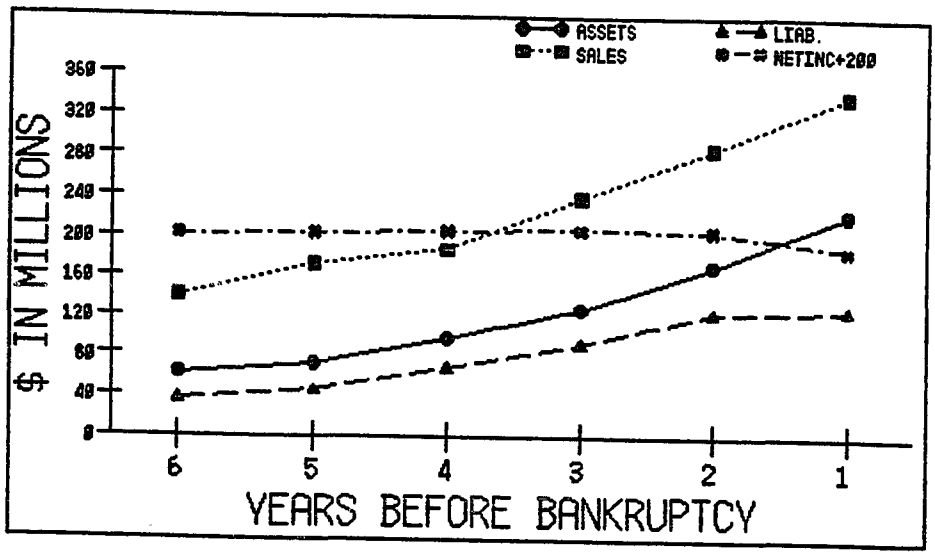

Table B5.1

Lionel Corporation
(Bankruptcy Year: 1982)

			years before bankruptcy					
			6	5	4	3	2*	1*
Total Ass.	mil	$	62	71	96	127	171	222
Sales	mil	$	141	172	187	238	287	339
Net Inc.	mil	$	2	3	5	6	5	-13
Common Eq	mil	$	23	26	28	36	47	33
Liabil.	mil	$	37	45	67	91	123	189
Stock Price		$	2.50	4.85	5.13	6.86	8.00	7.13
ROI		%	3.27	4.74	5.47	5.05	3.17	-5.90
Z			3.25	3.53	3.07	3.02	2.63	1.41
NZ5V			.67	.86	.76	.83	.73	-.57
NZ2V			.70	.94	.79	.84	.78	-.63

* Lionel's 1981 and 1982 annual reports were subjected to court challenge and were subsequently revised. The numbers here are from Lionel reports and differ on some points from Compustat data.

Historical Background

Lionel Corporation was incorporated in New York in 1918 as a successor to companies with similar names going back to 1901. Until 1960 Lionel's primary business was the manufacture of toy and model trains, but beginning in that year Lionel became actively involved in buying and selling small firms and parts of firms. Most of these business were small electrical and electronic manufacturing companies. In 1969 Lionel bought the Leonard Wasserman Co., a toy retailer, which under the name Lionel Leisure became the firm's largest business. In 1970 Lionel sold its historic model train business to General Mills. Over the next decade Lionel expanded its retail toy store business, both by acquisition and internal expansion.

By 1980 Lionel consisted of two major units, Lionel Leisure, Inc., and Dale Electronics, Inc. Lionel Leisure, the toy retailing unit, accounted for 76% of the firm's revenue, and Dale Electronics, the electronics manufacturing unit, for 26%. The remainder came from a variety of sources, including license fees for the Lionel trains from General Mills.

In 1981 Dale Electronics was converted to a public corporation with Lionel holding 82% of the stock. The remainder was publicly owned and traded on the American Stock Exchange. Dale Electronics was profitable and was not included in Lionel's bankruptcy petition. The Dale stock was one of

Lionel's most valuable assets and the arrangements for its sale were major issues in the bankruptcy reorganization.

Industry Factors

Since only Lionel's retail toy operations were involved in the bankruptcy, only factors for that industry will be discussed here. The national economy was in difficult straits in the period from 1979 through 1982. Growth was slow or negative, and inflation and interest rates were high. The toy business is responsive to the economic cycle, as spending on toys is discretionary. High interest rates are a problem for all retailers, but particularly so for toy and other retailers whose sales are highly seasonal. Inflation was a compounding factor, driving both the high interest rates and the cost of toy manufacturing. The recession driven decline in demand limited the ability of toy retailers to increase their prices as rapidly as their suppliers increased their prices.

The retail toy industry was in a transition period during the 1970's. Self-service toy supermarkets and toy departments in self-service discount stores were displacing the traditional department stores as the dominant outlets for toys. The newer outlets were price-competitive, which drove margins down for all. The discount stores had the advantage of being able to move a large volume of merchandise during the Christmas rush and then convert the shelf space to other lines of goods the

remainder of the year. In spite of the increasing number of outlets, toy sales had declined about 2%, on an inflation-adjusted basis, from 1976 to 1981. Given the price discounting and the lower cost distribution systems, this physical volume of toys probably increased in spite of the decrease in dollar volume.

Typical of the toy retail industry in this period was the 1974 bankruptcy of Interstate Stores and its subsidiary Toys-R-Us. Interstate was reorganized as Toys-R-Us, which went on to become one of the great success stories of bankruptcy reorganization.

Firm Factors

The events that lead to the bankruptcy of Lionel had a long history. For decades Lionel toy trains were one of the most prestigious toy brands in the world, and the company was small but profitable. From 1938 to 1958, dividends averaged over a dollar a share. Then came a period of decline as the toy market was filled with new products and the nation's attention to railroads was transferred to cars and airplanes. From 1959 to 1976, Lionel stock paid no dividends and stock prices fell below previous dividend payouts.

In attempting to rebuild the firm, Lionel first turned to electrical and electronic businesses,and later to toy

retailing. Both of these industries bore obvious relationships to their manufacture of electrical model railroads. In the period just prior to bankruptcy, the firm reorganized to separate the two very different businesses, with the toy stores being the dominant business.

The expansion in the toy business was rapid, both in number of stores and and in geographic coverage. From its original base in the Northeast, Lionel bought toy store chains in Florida, Texas, and the Middle West. The total number of stores increased from 56 in 1979 to 96 in 1980. The expansion was largely financed by short-term liabilities and leases, rather than long-term debt or equity. The short-term financing of expansion, plus the heavy borrowings used to manage the Christmas business (about 60% of annual sales) made Lionel very dependent on bank credit at high interest rates. In 1981 Lionel's weighted average interest rate on short-term borrowings was 19%. As of December 31, 1981, Lionel's credit line of $85 million was exhausted. The firm expected the lines to be renewed, but the banks cut off Lionel's credit after lending only $10 million. The credit cutoff led directly to Lionel's bankruptcy on February 19, 1982.

Prebankruptcy Financial Performance

Table B5.1 and Figure B5.1 provide the basic financial performance information. Basically the picture that emerges is

one of rapid growth and low profitability, with growth in assets running ahead of growth in sales. This pattern is one frequently observed in bankrupt firms. Financial restructuring, particularly the spinning off of Dale Electronics as a public corporation and related accounting actions, tended to obscure operational results in 1981.

The bankruptcy prediction models are inconsistent for Lionel. The original Altman model points to a company moving from success to decline, with bankruptcy predicted only in the final year. The new models developed in this study portray an unprofitable firm, continuously in position of high bankruptcy risk for all five years of the study. The primary difference between the models is the heavy positive weighting of the turnover ratio, sales to total assets, in the Altman model, while that variable has a small negative weight in the NZ5V model and is not included in NZ2V model. The relatively low retained earnings depresses all models, but the weight is much greater in the new models than in the Altman model.

Bankruptcy Proceedings and Outcome

Lionel filed for bankruptcy under Chapter 11 of the Bankruptcy Code on February 19, 1982. The bankruptcy filing included Lionel's two retailing units, Lionel Leisure and Consolidated Toy Company, but not Dale Electronics, which had become a separate publicly-held corporation in 1981. As of

December 31, 1982, the date of the first audited financial report following bankruptcy, bankruptcy liabilities were $140 million. Stockholders' equity was a negative $18 million, down from a positive equity of $33 million in 1981.

Lionel's bankruptcy reorganization was marked by extensive conflict between management and creditors and equity holders. The major issue was the role of Dale Electronics in the reorganization. Dale was not bankrupt and had been consistently profitable. In 1982 it had an operating profit of $8.4 on sales of $84 million, using assets valued at $56 million. However, creditors forced a decision to sell Lionel's 82% share of Dale. The sale generated further controversy as Lionel accepted offers for its interest in Dale for amounts unacceptable to the unsecured creditors' committee. The first accepted offer was for $43 million, which after a succession of bids and challenges, rose to $69.5 million. That sale to Dynamics Corporation of America became a matter of litigation, which ended with the postponement of the sale until after reorganization, with the provision that other offers over $70 million be considered. Eventually the Dale stock was sold for $76.9 million, of which $6 million was paid to Dynamics for damages.

During the reorganization period, Lionel continued to operate its toy business, but with a reduced number of stores. The Consolidated Toy division was sold to its management, and

many other stores were closed. Just prior to bankruptcy, Lionel operated about 95 stores, but by 1983 this number was reduced to 56. After losses of $13 million in 1981 and $51 million in 1983, Lionel turned around with a loss of only $7 in 1983 and profits of $20 million in 1984 and $40 million in 1985. Operating income had increased, but the earnings in 1984 and 1985 were largely from discontinued operations, restructuring gains, and tax benefits.

Subsequent to the bankruptcy filing, equity holders filed four class action suits against Lionel and several of its senior managers charging securities law violations in connection with financial reporting for 1980 and 1981. The actions also challenged loans and compensation agreements between Lionel and its President and Chief Executive Officer, Ronald D. Saypol, and its Executive Vice President and Chief Operating Officer, Richard R. Schilling, Jr. The original claim was for $47 million. The litigation ended in a complex settlement in which, without admitting fault, Lionel agreed to compensate the plaintiffs with a package of cash, notes, common stock, and warrants with a total value of about $2.5 million. Of this sum Lionel was to collect a portion from the officers involved, but the collection was deferred following the personal bankruptcy of Saypol. In addition, Lionel agreed to amend its By-Laws to provide for independent review of financial transactions between the company and its officers. The financial settlement was not a serious loss for Lionel, but

the litigation and the conflict between the company and its officers was time-consuming and complicated the reorganization proceedings.

The reorganization of Lionel was completed in 1985. All claims, except those of the unsecured creditors, were paid in cash. Unsecured creditors received a package of cash, notes, common stock, and warrants, which were valued slightly in excess of their claims. The new common stock issued to the unsecured creditors gave them about 46% of all common stock, and the original equity holders retained the remainder. The warrants proved to be worthless and were not exercised. Of the total claims of $146 million, $96 was paid in cash, with most of this coming from the sale of the Dale stock.

On December 31, 1981, immediately before bankruptcy, Lionel reported assets of $222 million and annual sales of $344 million. After reorganization Lionel reported assets of $112 million and annual sales of $251 million. Reorganized Lionel's only business was retail toy stores.

Managerial Turnover

At the time of its bankruptcy, Lionel's President and Chief Executive Officer was Ronald D. Saypol and its Executive Vice President and Chief Operating Officer was Richard R. Schilling, Jr. Saypol had been CEO since 1974 and had been an

officer since 1968. Schilling had been a senior officer for a number of years. Both men had been long-term employees of Lionel and had played major roles in the growth and restructuring of Lionel from a toy train manufacturer to toy retailer and electronics manufacturer.

In July 1982 Saypol and Schilling were placed on leave of absence, and in April 1983 Schilling resigned. In June 1983 Saypol's and Schilling's employment contracts were rejected by Lionel under bankruptcy rules. Saypol submitted a claim of $2.9 million, and Schilling $675,000. Lionel countered with a claim against Saypol for $600,000, but Saypol was in personal bankruptcy, so the claim became uncollectible.

There was rapid managerial turnover from the bankruptcy filing in February 1982 until March 1983, when Michael J. Vastola was elected Chairman of the Board and Chief Executive Officer. Vastola, then 38 years old, had been a Lionel employee since 1971. He was Controller and Chief Accounting Officer prior to February 1982, when he became Vice President-Finance. In July 1982 he became Acting Executive Vice President and Chief Operating Officer. Vastola's senior associates during reorganization and since also came up through the ranks at Lionel. The new officers were relatively young, as were the officers they replaced. Saypol was 53 at the time of the bankruptcy.

Discussion

The story of Lionel is one of a firm in a declining business that refused to die. For the first half of the 20th century, children's model trains were one of the most popular toys, and Lionel was the preeminent supplier. After World War II the demand for model trains declined until they were more a hobby for nostalgic boys grown old than a hot Christmas item. With the decline in its traditional business, Lionel sought to diversify into new businesses to replace the trains. That search took two different directions, both related to its prior experience: one into toy retailing, and the other into electronics and small electro-mechanical systems.

In 1961 Lionel acquired Dale Electronics, which had been founded in 1951. Dale was primarily located in Nebraska, and throughout its years with Lionel operated relatively independently. In addition to Dale, from 1960 to 1970, Lionel bought and sold a string of small manufacturing businesses. The impression is one of an almost desperate attempt to find a new basis for preserving the firm.

In 1969 the strategy shifted to toy retailing, first with Leonard Wasserman Co., which became Lionel Leisure. In 1970 Lionel exited the toy train business by licensing them to General Mills, then expanding into the toy business. From that acquisition until the bankruptcy filing in 1982, Lionel

expanded in toy retailing, both by buying up small chains of toy stores and opening new stores.

Lionel is a classic example of firm seeking to find a new niche as its old niche declines. However, none of the moves was very successful, and the financial strength of the firm declined. This in turn limited the choice of new ventures to either small acquisitions or mergers based on exchange of stock. Leonard Wasserman was acquired for 1.5 million shares of Lionel common stock. The consolidation of the toy industry in response to industry weakness and cut-throat competition was rational, but it did not produce strong firms. Lionel's expansion only resulted in profitless growth, and made the firm ever more vulnerable to cash and credit crises, which in the end precipitated the bankruptcy.

The Dale Electronics story illustrates another characteristic of failing firms. With a strong commitment to survival, Lionel management first took steps to protect Dale by taking it public and separating its fate from that of the toy side of the business. After bankruptcy the Lionel management would rather have reorganized around Dale than the toy business, but that strategy was blocked by the creditors, who saw in Dale an asset that could be sold for cash. Once in bankruptcy managers are far more limited in their options than they were before bankruptcy.

Overall the Lionel experience points to the high cost of pursuing survival over all other goals. It also points out that the major losses may occur long before bankruptcy or other endgames. Actually Lionel and its creditors fared quite well in bankruptcy, and the firm survived. The big losses occurred between 1953 when Lionel stock sold for $28 and paid a dividend of $1.25 per share and 1962, when the stock sold for $4.50 and paid no dividends. From that time on, through the bankruptcy period and after reorganization, little further loss was experienced. The Lionel case clearly suggests that investors in a firm in declining businesses might be better served by an early liquidation of the firm than by attempts to find new businesses under the existing structure and management.

The extent to which explicit managerial conflict of interest and malfeasance contributed to the failure of Lionel is not clear. Although no one was convicted of wrongdoing, neither did the out-of-court settlement of the securities litigation absolve the senior managers, particularly Saypol and Schilling, of misconduct. The relatively small settlement suggests that the substantive effects may have been small. The real disservice to stockholders was not the manipulation of personal compensation, but rather the long-term erosion of corporate assets in pursuit of survival at any cost.

Appendix B6

REVERE COPPER AND BRASS INCORPORATED

Summary

Founded 1928. Related diversifier in copper and aluminum production and fabrication.

Failure pathway: Growing sales in a declining industry.

Bankrupt 1982. Assets $474M. Exchange NYSE.

Reorganized 1985. Assets $274M. Exchange NYSE.

Figure B6.1

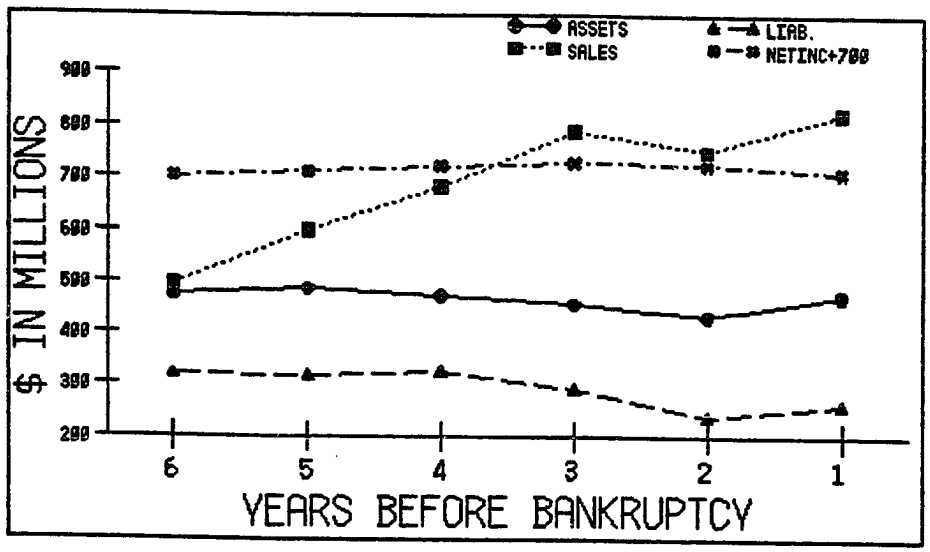

Table B6.1

Revere Copper and Brass Incorporated
(Bankruptcy Year: 1982)

			years before bankruptcy					
			6	5	4	3	2	1
Total Ass.	mil	$	476	488	475	458	433	474
Sales	mil	$	498	598	681	788	748	821
Net Inc.	mil	$	2	10	21	26	22	9
Common Eq	mil	$	138	153	133	159	181	189
Liabil.	mil	$	318	315	324	290	236	260
Stock Price		$	9.63	13.25	13.25	15.25	16.25	14.75
ROI		%	.35	2.08	4.46	5.62	5.05	1.98
Z			1.88	2.12	2.60	3.01	3.08	2.92
NZ5V			.85	.92	.90	1.13	1.37	1.32
NZ2V			.83	.97	.83	1.12	1.43	1.35

Historical Background

Revere Copper and Brass was incorporated in Maryland in 1928 and took its current name in 1929. The company was formed by combining the businesses and assets of several smaller firms in the copper and brass industry. Several of the firms had long histories, one founded in 1801 by Paul Revere of Revolutionary War fame. In 1956 the company expanded into the aluminum business in a joint venture, Ormet Corporation. The original joint venture partner, Olin Corporation, later sold its interest to Consolidated Aluminum Corporation. Prior to its bankruptcy, Revere was one of the largest copper and brass fabricators in the United States, perhaps best known for its Revere Ware cooking utensils.

Industry Factors

In 1982 both the aluminum and copper businesses were in recession. At the end of 1981 primary aluminum was operating at 76% of industry capacity, a level sustained only by drastic price cutting. Although the nominal price of aluminum was being maintained at 76 cents a pound, it was selling for 51 cents. Part of the problem was due to imports and a general business recession, but overexpansion in the industry, including additions by Revere, was a major contributing factor. The aluminum industry was in a profit squeeze between the declining price of aluminum and the rising cost of electrical

power, a critical cost variable for the aluminum industry.

The copper industry was also in recession. Copper industry demand was closely tied to housing starts which were in decline, and increasing import pressure was being felt. Imports reached 20% of domestic shipments in 1981. Import competition was troublesome to the copper industry, because, like the steel industry, it was burdened with antiquated production facilities and high labor costs.

Firm Factors

Prior to its bankruptcy Revere was experiencing problems in both its copper and aluminum businesses, but it was the aluminum business which dominated the firm's failure and reorganization. The copper segment was suffering from the typical woes of the broader U. S. metals industry, and some unique problems. Cheap copies from Korea of Revere Ware's prestigious cookware were flooding the market. Revere had been in the process of restructuring its copper-related businesses. From 1975 to 1981 ten operations had been discontinued, and the company had taken a strike at one plant in an effort to keep labor costs in check.

Although Revere had entered the aluminum business during World War II and had begun a joint venture with Olin in 1956, its major investment came in the 1970's with the construction

of a major aluminum reduction plant and a rolling mill in Scottsboro, Alabama. The plants were designed for easy expansion, which was expected to reduce unit costs. Almost as soon as the plants were completed, Revere recognized that the construction of the plants was a mistake. Plans to expand the plants and share costs with a consortium of Japanese plants were dropped as demand for aluminum declined and power costs increased. In 1977 an agreement was reached to sell the Scottsboro facilities to Alcan Aluminum Corporation, but the sale was stopped by an unfavorable ruling from the Antitrust Division of the Justice Department.

Revere closed the reduction plant at Scottsboro to cut operating losses, but there were large continuing costs: debt service on a $55 million industrial revenue bond issue, take or pay contracts with the Tennessee Valley Authority (TVA) for electrical power and Aluminum Corporation of America (ALCOA) for alumina, and contractual obligations to union employees for plant closing benefits.

Although the financial crisis for Revere was focused on Scottsboro, other operations were experiencing difficulties. In addition to closing the least profitable operations, Revere undertook a general corporate cost-cutting effort, but the cost savings were relatively small compared to losses in the aluminum business. When the losses from aluminum exceeded all other operating profits, Revere filed for bankruptcy on October

27, 1982.

Prebankruptcy Financial Performance

Table B6.1 and Figure B6.1 provide the basic financial performance information. Revere's 34% interest in Ormet, the joint venture with Consolidated Aluminum Corporation, was carried on the balance sheet as an investment of $31 million. Ormet delivered 34% of its output to Revere at cost, so Ormet showed no profit or loss.

As indicated by the data, Revere's performance was not typical of bankrupt firms. From 1976 to 1981 sales were growing more rapidly than the asset base, and while profitability was unsatisfactory, the company was doing better that it had in the previous five years, until 1981. Stock prices and Z-scores also exhibited a similar upward trend. As indicated above Revere turned to bankruptcy to resolve a specific problem which appeared otherwise insoluble.

Bankruptcy Proceedings and Outcome

Revere filed for bankruptcy under Chapter 11 of the Bankruptcy Code on October 27, 1982. As of December 31, 1983, the date of the first audited financial report following bankruptcy, bankruptcy liabilities were $221 million. Stockholders' equity was $32 million, down from $189 million in

1981. The $157 million loss in 1982 was made up of an operating loss of $85 million and a restructuring loss of $100 million and an offsetting tax credit of $28 million.

Bankruptcy reorganization efforts centered on the claims and commitments associated with the Scottsboro reduction plant operations. On the suspension of operations, the initial claims were $102 million to TVA, $111 million to ALCOA, and $17 million to members of the United Steelworkers of America. In 1984 Revere negotiated a reduction in those claims to $33 million for TVA and to $20 million for ALCOA. Revere agreed to accept the Steelworkers' individual claims, which Revere estimated to be $12 million.

Once the TVA and ALCOA negotiations were completed, the remainder of the reorganization proceeded smoothly. Under the Bankruptcy Court-approved reorganization plan, all remaining creditors received full compensation for their claims in cash, debt instruments, or common stock equivalents. New common stock was issued for distribution to creditors, which had the effect of reducing the old stockholders' interests from 100% to 77%. Although technically all claims were paid, creditors had some losses, as almost always happens in bankruptcy cases. Interest on debt does not accrue for firms in bankruptcy, and the costs of delays and claims collection are not reimbursed.

Revere used the bankruptcy reorganization as an

opportunity to reduce its aluminum business and to improve its efficiency in the copper business. In 1981, the last full year before bankruptcy, Revere had sales of $821, 82% in aluminum; in 1985 Revere had sales of $459, 74% in aluminum. From 1981 to 1985 Revere reduced its total assets from $474 million to $274 million. After bankruptcy Revere continued to reduce its aluminum investment, including the sale of its Wells Aluminum Company subsidiary.

During the reorganization period Revere, reduced its assets and sales, and returned to profitability. The firm had an operating profit in each year, although restructuring charges in 1984 resulted in a loss in net income. The stock price range in 1983 to 1985 was $6.75 to $17.75, compared to a range of $10.87 to $25.37 from 1979 to 1981. The stock hit a low of $4.75 in 1982 immediately after the bankruptcy filing.

Prior to its bankruptcy ASARCO Inc. held one-third of Revere's common stock. In 1983 this block was sold to Bear, Stearns & Co., which converted the holding into a limited partnership. After reorganization, in 1986, this block was acquired by Jamie Securities. Jamie then made a tender offer for Revere stock. After several rounds of bidding, including an offer from management, Revere was taken private by JOZ I Corporation, a consortium of financial firms made up of Jamie Securities, Oxford Financial Group, and Prudential Equities. The takeover was considered friendly, and current management

was retained.

Managerial Turnover

The Revere bankruptcy was unusual in many ways, and the typical pattern of high managerial turnover was not observed. At the time of the 1982 bankruptcy, the CEO was William F. Collins, who had been President since 1971 and CEO since 1975. In 1984, on his retirement as CEO, he was formally elected Chairman of the Board. Prior to that time the Board had operated without a formal chairman with Collins serving as attorney-in-fact for the board members. Collins was replaced by Hugh H. Williamson III, formerly CEO of Edgcomb Metals Company. Several senior managers served throughout the study period.

Discussion

The bankruptcy of Revere was unusual in a number of respects, and the case lends itself to varying interpretations. The case is further complicated by financial arrangements not fully revealed in routine reports. Using the classification rules developed in this study Revere falls in the category designated as the fight-for-market-share pathway, a growing firm in a declining industry. However, unlike the general pattern observed in this study, Revere's asset growth did not outrun its sales growth. In the five years before bankruptcy

Revere's sales grew by 65%, with no growth in assets. The multivariate bankruptcy prediction models failed to predict the bankruptcy, but rather showed Revere to be financially stable and improving.

The most important conclusion about the Revere bankruptcy is that the bankruptcy was a response to a specific problem, not a general failure. Revere's primary problem was its Scottsboro, Alabama, aluminum facilities. This reduction plant and rolling mill had been built in the mid-Sixties using industrial revenue bonds issued by the Industrial Development Board of Scottsboro. Revere had a continuing lease obligation, which was carried on the books as if the firm had constructed and owned the plants. Primary metals production is typified by high investments, long development cycles, and inflexible utilization efficiencies. It would appear that this was a case of overexpansion, but one for which the consequences were slow to appear. A reading of the record also suggests that the industrial revenue bond financing, while financially attractive in itself, made it more difficult for Revere to negotiate changes in terms of the lease obligations than it would have been with more conventional bond obligations.

Although the bankruptcy reorganization was relatively successful, the case illustrates the high cost of bankruptcy as a conflict-resolution mechanism. When operations at Scottsboro were suspended and the bankruptcy petition filed, TVA had a

claim of $102 million and ALCOA had a claim of $111 million. In 1984 Revere negotiated a reduction in those claims to $33 million for TVA and to $20 million for ALCOA. Since all other creditors were paid in full, the outcomes suggest that the bankruptcy might have been averted, if TVA and ALCOA had been more realistic in their initial settlement demands. The reasons for their recalcitrance is not known, but it may be that the government ownership of TVA made it excessively bureaucratic and inflexible. ALCOA's role as both supplier and competitor may have contributed to its reluctance to settle quickly.

Overall the case serves as an example of strategic bankruptcy. Revere was not under the threat of involuntary bankruptcy, nor was it bankrupt by conventional definitions of bankruptcy. Except for the TVA and ALCOA claims, which were settled outside the Bankruptcy Court, all creditors received the full amount of their claims, but the delays and process must have been costly. The stockholders suffered on a slight dilution of ownership.

For the purposes of this study, the reorganization of Revere was classified as successful; the firm remained autonomous and maintained over 50% of its prebankruptcy size. The evaluation of the bankruptcy as financially successful is reinforced by the acquisition and taking of Revere private by JOZ I Corp. The acquisition stock price of $22.50 exceeded any

market price after 1971. If the retention of autonomy and identity is the criterion for organizational success in bankruptcy, then Revere was technically successful in reorganization, but the success was short-lived. The loss of autonomy and identity is commonly observed in bankruptcy cases, either in the bankruptcy process or subsequent to reorganization. This reinforces the conclusion that financial and organization success are not necessarily the same, and that classification of bankruptcies as successful or not is often arbitrary and time-bound.

Appendix B7

SALANT CORPORATION

Summary

Founded 1919. Single business in the apparel industry.

Failure pathway: Declining sales in a growing industry.

Bankrupt 1985. Assets $110M. Exchange NYSE.

Reorganized 1986. Assets $80M. Exchange NYSE.

Figure B7.1

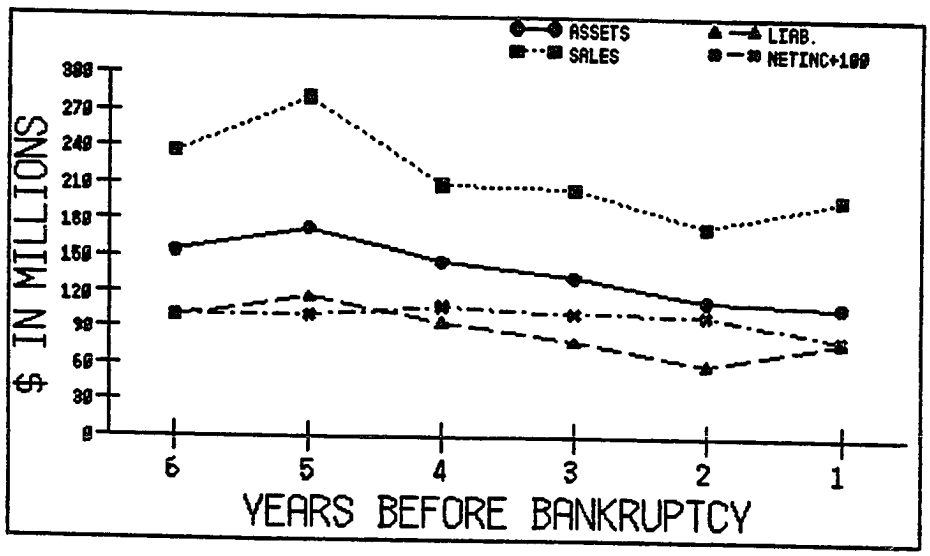

Table B7.1

Salant Corporation
(Bankruptcy Year: 1985)

			years before bankruptcy					
			6	5	4	3	2	1
Total Ass.	mil	$	154	173	146	133	114	110
Sales	mil	$	236	281	210	206	175	199
Net Inc.	mil	$	2	1	9	3	1	-19
Common Eq	mil	$	52	51	44	47	47	25
Liabil.	mil	$	100	117	95	78	60	79
Stock Price		$	5.88	7.88	10.50	9.00	11.88	7.13
ROI		%	1.26	.37	6.30	2.45	1.00	-17.20
Z			2.76	2.77	2.88	2.92	3.07	2.29
NZ5V			1.14	1.02	1.13	1.28	1.60	.48
NZ2V			1.03	.94	.98	1.16	1.50	.46

Historical Background

Salant was established as a family apparel business in 1893, incorporated in New York as Salant & Salant in 1919, and adopted the name Salant Corporation in 1971. Between 1962 and 1976 Salant acquired a number of small clothing manufacturing firms. Traditionally Salant had been a men's pants producer, but with the acquisitions, it expanded into women's and children's clothing and a more complete line of men's clothing. Corporate headquarters was in New York. Production facilities were distributed throughout the South, with insignificant operations in Mexico and Canada.

Industry Factors

The apparel manufacturing industry is highly fragmented and characterized by firms with relatively narrow product lines. Most of the firms are relatively small single businesses. Neither diversification into other industries nor acquisition of garment makers by conglomerates is common. In the garment industry a diversified firm is one which produces both men's and women's clothing, indoor and outdoor wear, or work and dress clothes.

The industry has two major segments, both of which are highly competitive and volatile. One segment consists of

high-volume generic products sold under private labels by large retail chains. Contracts for producing this merchandise is a mixed blessing for manufacturers. The sales volume is large and can be quite stable, but the chain stores use their heavy buyer power to keep prices and margins down.

The second industry segment largely follows a differentiation strategy based on highly advertised brand labels, high quality, and fashion appeal. In this segment changing fashions are the primary contributor to volatility. Misjudgments about fashion demand lead to decreasing sales volume and/or large price markdowns. Firms in the fashion segment may contract out all production, limiting their role to design, marketing, and distribution. For firms that do their own manufacturing, shifts in demand between segments within the industry lead to capacity problems in specialized plants and divisions, with some plants underutilized and others unable to keep up with demand.

The apparel industry is relatively low-technology and labor-intensive, both of which make the industry vulnerable to imports. Trade restrictions and tariffs are a constant source of concern tc the industry and subject to frequent changes depending on current economic and political conditions.

The garment business is seasonal, which creates both production and financial strains. Traditionally the garment

makers have financed retailers' inventories, either selling on consignment or carrying accounts receivable until after major selling seasons. In addition, garment makers often carry large inventories, shipping on demand to retailers. As a result, they tend to be dependent on short-term credit lines from banks or other financial institutions. Under financial pressure, the firms may turn to factoring accounts receivable, which reduces margins. The large inventories create additional problems. During periods of high interest rates, such as in the years preceding Salant's bankruptcy, carrying large inventories is costly. With rapid changes in fashions, the value of inventories declines rapidly, and excess production must be moved out with drastic price reductions.

During the period preceding Salant's prebankrutpcy the apparel industry was growing. However, that growth was more of a recovery from a previous low period than a long-term secular trend. In a broader perspective, the garment industry could be more accurately described as a volatile, cyclical industry than either a growing or declining industry.

Firm Factors

Salant suffered many weaknesses common to the apparel industry with some additional less common problems. Not only is the apparel industry fragmented and volatile, Salant, like many other firms, was also internally fragmented and volatile.

In 1982 Salant had more than thirty plants and warehouses in eight states, plus Canada and Mexico. In addition, it had eleven office locations and fifteen retail outlets. Many of the plants were highly specialized, producing only one garment type, for example denim jeans. Most of Salant's business was in clothing for men and boys, but it had two divisions that made clothing for women or children. Changing demand patterns, within both the industry and its subsegments, from year to year led a constant reshuffling of production facilities. Some were plant conversions to new lines of garments, but many involved opening new plants and closing old ones. Throughout the prebankruptcy period Salant closed a number of plants, distribution centers, and stores. These asset reductions created accounting losses, which were a major factor in Salant's poor financial performance. The reshuffling also included a significant number of relatively small acquisitions and divestitures.

Salant's business was largely in the private label segment of the industry. From 1980 to 1985 Salant sales to just Sears, Roebuck and J. C. Penney ranged from 39 to 53 % of total sales, with most of the goods going to Sears, which is well known for exerting its buyer power. Among other pressures, the large volume of sales to Sears forced Salant to maintain a separate line of bank credit just to finance Sears' purchases.

Prebankruptcy Financial Performance

Table B7.1 and Figure B7.1 provide the basic financial performance information. Salant's sales and assets peaked in 1980 and declined thereafter. The sharp decline in sales from 1982 to 1983 was entirely caused by decreased sales to Sears; all other sales increased. Earnings were consistently low, but only in the year preceding bankruptcy was there a net loss.

Salant's market performance in the prebankruptcy period was consistent with its accounting-based performance. Stock prices were consistently low, in the $5 to $10 range, with market prices below book value. Those prices were less than half of what they had been a decade before. Within any given year price variations were large on a percentage basis, but the variations were not atypical of low-priced stocks in general. In spite of its poor earnings, Salant paid dividends every year until it went bankrupt. In several years the dividend payout exceeded net earnings. The price did not drop sharply on the bankruptcy announcement, and the stock traded with the same range throughout the bankruptcy period. The stock was listed on the New York Stock Exchange, where it traded without interruption during bankruptcy and after reorganization.

As shown in Table B7.1 and Figure B7.1, Salant was a declining firm in term of assets and sales, but the bankruptcy prediction models did not accurately point to its ultimate

bankruptcy, until the final year. Even in the final year the Altman Z-score was in the "gray zone," but well above the bankruptcy cutoff of 1.8. The Altman Z-score was maintained by Salant's high score on working capital and a high sales to asset ratio. The new Z-score models, which are heavily weighted for retained earnings, picked up the sharp drop in that variable in the final year, when a large negative net income led to a drop in retained earnings. The working capital variable was misleading, because it is positively weighted in the general model, but for Salant the financing of large accounts receivable and inventories was the primary cause of bankruptcy.

Short-term financing became an increasingly difficult problem for Salant during the prebankruptcy period. Interest expense increased rapidly, and the banks tightened their loan conditions. The financing of sales to Sears was provided separately from that for other operations. By 1984 the short-term debt was secured by specific accounts receivable, rather than unsecured credit lines. By the time of the bankruptcy, Salant was totally dependent on its banks for the short-term credit necessary to survive. With the withdrawal of that credit, Salant had no alternative to bankruptcy.

Bankruptcy Proceedings and Outcome

Salant and its two largest subsidiaries filed for

bankruptcy under Chapter 11 of the Bankruptcy Code on February 22, 1985. Liabilities were estimated at $65.2 million. From December 1, 1984, the end of the fiscal year before bankruptcy, to November 30, 1985, Salant's assets fell from $110 million to $93 million and shareholders' equity fell from $25 million to $17 million, therefore, by an equity definition, the firm was not bankrupt.

The immediate cause of the bankruptcy was the failure of Salant to reach an agreement with its short-term creditors, primarily Manufacturers Hanover Commercial Corporation. In 1984 bank borowings reached $17 million, and without continuing assurance of credit lines, Salant had little choice but to file for bankruptcy. Within two months after the the bankruptcy was filed, Salant was able to renegotiate a $15 million line of credit with Manufacturers Hanover. This renegotiation was made possible by the provisions of the Bankruptcy Code that allow bankrupt firms continuing in business, with the approval of the Bankruptcy Court, to undertake debt for which repayment has a higher priority than prefiling liabilities.

On February 22, 1985 Salant retained Ray W. Williams as a consultant, and on March 21 gave him chief executive powers. Williams had previously managed the successful turnaround of Farah Manufacturing Co., another clothing manufacturer. Under William's direction

The reorganization of Salant went very quickly. The firm accelerated the prebankruptcy program of plant closings and asset pruning, and took measures to cut costs in continuing operations. Salant emerged from bankruptcy in March 1987. A successful reorganization in two years is unusually rapid for bankrupt firms of Salant's size. In 1984, the last year before bankruptcy, Salant had assets of $110 million and sales of $199 million. In 1987, assets were $80 million and sales $136 million. Salant returned to profitability before the end of 1985, took a small loss in 1986 (largely as a result of restructuring costs), and earned $8.6 million in 1987. The company was considerably streamlined both by the sale of unprofitable units and the merger of continuing units into larger entities.

The reorganization plan provided nearly full recovery for all claimants. All claims, except those of the unsecured creditors, were paid in cash. Unsecured creditors received $450 in cash, $500 in debentures, and four shares of Salant common stock (market value slightly in excess of $50) for each $1000 in claims. Original stock holders retained 90% of the common stock, which by the time of the reorganization had doubled in price. New stock was issued to meet obligations to unsecured creditors and to provide an ownership interest for management.

After reorganization the firm continued to do well. In

1988 Salant acquired Manhattan Industries, Inc., another clothing manufacturer three times Salant's size via tender offer of $18.50 per share. Manhattan was in serious financial difficulty, and its stock had fallen from $26 in 1984 to $9.37 in 1988 before the tender offer. Manhattan had lines that complemented Salant's and a strong brand name.

Managerial Turnover

Managerial turnover was low in the prebankruptcy period. Carl S. Forcheskie became Executive Vice President in 1977 and President and Chief Executive Officer in 1981. John S. Rodgers became Secretary and General Counsel in 1977 and Chairman of the Board in 1981. Both had served in other capacities at Salant for extended periods of time prior to 1977. At the time of the bankruptcy, Rodgers owned 16% of the outstanding common stock of Salant. Forcheskie had only a small ownership stake in the company, but was voting trustee for a large block of stock which belonged to the Salant family trust.

Forcheskie had multiyear employment contract which paid about $190,000 per year. On March 21, 1985, one month after the bankruptcy filing, his contract was terminated under provisions of the Bankruptcy Code that allows bankrupt firms to reject contracts. He subsequently filed a claim for compensation of $970,000. His claim was settled for $209,000 as an administrative priority claim and $180,000 as an

unsecured claim. Rodgers continued in his positions throughout the bankruptcy period.

On February 22, 1985, the day of the bankruptcy filing, Salant retained Ray W. Williams as a consultant. Williams was highly regarded for his part in a dramatic turnaround at Farah Manufacturing Co., a garment maker quite similar to Salant. Williams was given a contract which provided for cash compensation of about $500,000 per year. Just one month later, he was given chief executive powers. Later, as a part of the reorganization plan, he obtained stock and stock options sufficient to give him a 10% ownership interest in the firm. Williams took an aggressive leadership position in the reorganization, and has continued to serve as chief executive in the postbankruptcy period. The Manhattan acquisition was a clear indication of the managerial strength and credibility Williams added to Salant.

Discussion

The Salant bankruptcy was a classic case of a bankruptcy caused by a cash-flow crisis. The firm's assets exceeded its liabilities both before and during bankruptcy. During the years immediately prior to bankruptcy, Salant became increasingly dependent on annual extension of bank credit. Credit extension depended both on objective financial factors and creditor confidence. After years of turnaround efforts,

Salant had accomplished little in its efforts to put the firm on a profitable footing. It had eliminated unproductive assets and cut costs, but the unsatisfactory profit margins did not improve. Its turnaround efforts could probably be characterized as too little, too late, a common failing of turnaround efforts by entrenched management.

The Salant bankruptcy provides a case for which the catastrophe theory provides a reasonable interpretation. As developed in more detail in Chapter 3, catastrophe theory suggests that failing firms exist in an unstable state in which bankruptcy is possible, but not inevitable. Bankruptcy is an irreversible change in state which can be precipitated by a change in a control variable, in this case creditor confidence. Consistent with the theory, Salant was not objectively worse off at the time of bankruptcy than it had been previously, but it had been unable to move out of the danger zone. As a result, the bankruptcy event was precipitated by an outside force which the firm could not control.

From another point of view, bankruptcy can be seen as a conflict-resolution mechanism. Bankruptcy is an expensive conflict-resolution mechanism, and a negotiated resolution should be less costly for all parties. However, one creditor may be able to increase the value of his claim by forcing bankruptcy, even if, in so doing, he decreases the values of other claims. In this case the banks, which had unsecured

claims, forced the bankruptcy, acting on the belief that bankruptcy would strengthen their claims.

The Bankruptcy Code is primary determinant of relative value for bankrupt firms. This can be seen in this case in the bank's granting of a credit line to the bankrupt Salant that was little different from the one refused only months earlier. Postbankruptcy debt has a high priority claim on the bankrupt firm's resources, while prebankruptcy unsecured debt has a low priority. Claimants whose claims may have been impaired by the new loan were willing to allow Salant to go forward with the credit extension, because, given the fact of bankruptcy, continued operation of the firm had a greater expected value than its liquidation, which was likely to occur without credit extension.

One other lesson that can be learned from this case is the effectiveness of bankruptcy as stimulus for turnaround action. Salant had spent nearly a decade slowly taking steps to eliminate unproductive assets and to cut costs. However, the actions continued to be just sufficient to keep the firm alive, but not aggressive enough to achieve a permanent turnaround. It is not possible to know whether management simply didn't know how to get the desired results, or whether internal conflict or other managerial factors blocked effective action. Bankruptcy forced more aggressive action and provided temporary protection for turnaround through reorganization. In addition,

in this case, as in many others, bankruptcy provided an opportunity to change leadership. Any new leadership would have the advantage of fresh insights and reduced history-based constraints, but in this case, these general advantages were increased by the employment of Ray Williams. Williams not only brought his rich experience from the Farah turnaround, but he also gave Salant instant credibility in the financial community.

In summary, this bankruptcy reorganization became a successful turnaround because the firm went bankrupt before it lost its vital core and essential resources, and because bankruptcy gave an opportunity for new and gifted leadership. This reinforces the almost universal lesson: if a firm is doomed to go bankrupt, sooner is better than later. However, this leaves the more difficult question, is bankruptcy inevitable, or are there better options available?

Appendix B8

WHEELING-PITTSBURGH STEEL CORPORATION

Summary

Founded 1852. Single business in the steel industry, with significant vertical integration.

Failure pathway: Declining firm in a declining industry.

Bankrupt 1985. Assets $1220M. Exchange NYSE.

In reorganization. Exchange NYSE.

Figure B8.1

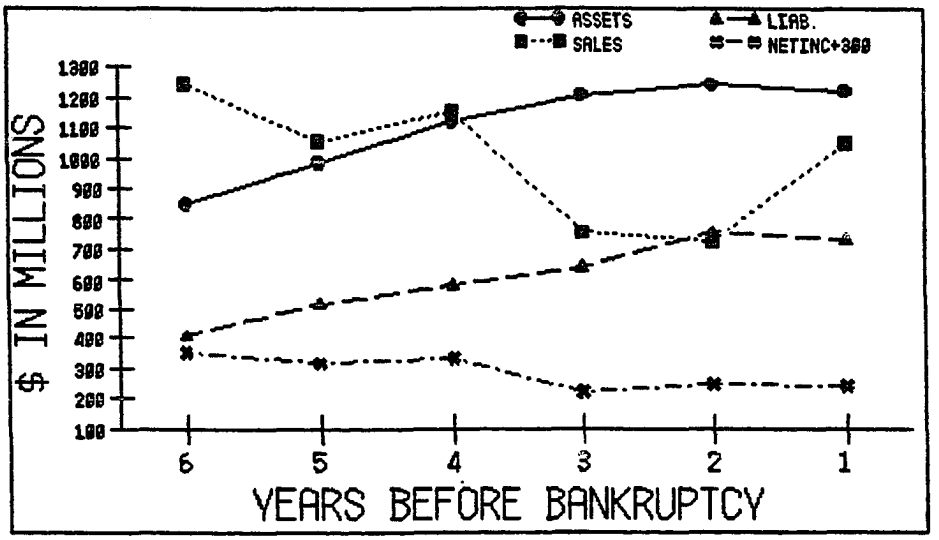

Table B8.1

Wheeling-Pitsburgh Steel Corporation
(Bankruptcy Year: 1985)

			Years Before Bankruptcy					
			6	5	4	3	2	1
Total Ass.	mil	$	847	983	1120	1207	1241	1220
Sales	mil	$	1242	1054	1151	755	722	1049
Net Inc.	mil	&	50	15	32	-79	-54	-59
Common Eq.	mil	$	341	353	411	348	285	254
Liabil.	mil	$	405	518	586	642	755	733
Stock Price		$	17.13	21.00	30.50	15.13	27.75	13.63
ROI		%	5.87	1.49	2.82	-6.54	-4.36	-4.87
Z			2.38	1.61	1.74	.93	.74	1.12
NZ5V			1.00	.90	1.03	.73	.50	.31
NZ2V			1.12	1.02	1.13	.78	.60	.35

Historical Background

Wheeling Steel Corporation was incorporated in Delaware in 1920, consolidating three smaller steel companies which dated back to 1857, 1875, and 1892. In 1968 Wheeling Steel Corporation merged with Pittsburgh Steel Company and adopted the name Wheeling-Pittsburgh Steel Corporation. Wheeling-Pittsburgh is an integrated steel company that produces the major share of its iron ore and coal, and uses its raw steel to fabricate a variety of steel products, including pipe, galvanized sheet, and other semifinished products. At the time of its bankruptcy, Wheeling-Pittsburgh the was ninth largest integrated steel company in the United States.

Industry Factors

The history of the steel industry following World War II is well known. In 1945 the American steel industry was the only healthy steel industry in the world. The steel mills of Western Europe and the less well-developed mills of Japan had been largely destroyed in the war, and the only nonbelligerents were small, like Sweden, or still undeveloped, like Brazil. In the years that followed, the industrialized nations rebuilt and expanded their mills, and domestic steel production became the goal of many developing countries.

By 1985 the American steel industry was marked by obsolete

plants and processes and high labor costs. In Western Europe and Japan the postwar plants were much more efficient than their aging American counterparts, and many of the developing countries had become net exporters rather than than steel importers. The developing countries had the dual advantages of newer technology and lower labor costs. In addition, the American steel industry had been forced to expend huge sums to meet increasingly stringent environmental requirements. The economic consequences to the industry were catastrophic. The integrated steel companies in the United States suffered combined net losses of over a billion dollars per year in 1982 and 1983. The general economic recovery that followed helped to reduce those losses, but did not return the industry to profitability.

Changes in international trade patterns contributed to the problem. Not only were imports of unfinished steel a problem for the industry, but domestic demand was declining as imports of automobiles, and other products with high steel content, were also on the increase. Import pressures and excess capacity intensified price competition, and costs remained high. Inflation and interest rates were at record levels, as was the dollar exchange rate, which stimulated imports and impeded exports. Calls for import restrictions and higher tariffs ran against the grain for the Reagan administration, which tried to help the situation by negotiating voluntary constraints, but the results were minimal. Inflation and

highly restrictive labor contracts prevented the steel companies from cutting wages or increasing labor productivity. Labor costs were also affected by increasingly stringent employee safety requirements and pension protection legislation. Domestic competition from new higher technology and lower cost minimills further hurt the old integrated companies.

With an increasingly hostile environment and severe cash flow problems, a number of steel companies sought to diversify their businesses. United States Steel, the industry leader, acquired Marathon Petroleum, and other smaller firms made smaller acquisitions. Given their financial weakness, the steel companies were limited in the number of options they could pursue and in the effectiveness of their bargaining power.

Firm Factors

Wheeling-Pittsburgh's situation was characteristic of the industry. As an old line steel producer, it had very large old plants, many of which were inefficient, and a highly unionized work force. It had extensive vertical integration, but essentially no diversification outside the industry.

By the beginning of the study period, Wheeling-Pittsburgh, like other steel companies, had recognized the necessity of

modernization. From 1978 to 1983 Wheeling-Pittsburgh spent $536 million dollars on plant modernization, more than twice as much as it had spent in the previous five-year period. For a variety of reasons the expenditures did not provide a quick return. Large sums were expended to meet environmental pollution control standards, and the new production processes and facilities, at best, were only catch-up technology, not breakthrough competitive advantages. High interest rates combined with increased debt drove interest costs from under $13 million in 1979 to over $61 million in 1984. In another move to improve productivity, Wheeling-Pittsburgh entered into a cooperative agreement with Nisshin Steel Company, Ltd., of Japan to explore mutual interests, including a joint venture to produce and market coated steel products in the United States.

By 1982 Wheeling-Pittsburgh had begun to drive labor costs down. In April of that year it negotiated a wage reduction agreement and adopted an Employee Stock Option Plan. Later the agreement was extended through 1983 and 1984. However, labor costs remained high and work rules inflexible compared with both foreign producers and the new nonunion minimills in the United States. In 1985 the company was unable to negotiate further concessions from the union, a failure which became the triggering event for bankruptcy.

Prebankruptcy Financial Performance

Table B8.1 and Figure B8.1 provide the basic financial performance information. Wheeling-Pittsburgh like many steel companies had been a poor performer for many years. In the six years shown in Table B8.1, Wheeling-Pittsburgh had three years with net losses and three with only minimal profits, and the six years before that were little better. Only in 1974 and 1979 did ROI exceed 5%. From 1963 to 1984 dividends on common stock had been paid only in 1974, 1975, and 1979. The steel industry is well known as a cyclical industry, but doing little better than breaking even in good years and losing money in bad years was not adequate for long-term survival.

The stock market's valuation of Wheeling-Pittsburgh reflected its accounting performance and dividend record. The market price varied from 20% to 40% of book value. The stock price nearly doubled in 1983, in part as a response to capital investments, but also helped by a bull market.

The bankruptcy Z-scores were consistent with Wheeling-Pittsburgh's deteriorating financial condition and with each other. The two-variable model, NZ2V, was the slowest to predict bankruptcy. This model carries a heavy weight for returned earnings, and Wheeling-Pittsburgh had accumulated retained earnings, which were only slowly eroded in its slow decline. The book value of common equity was $254 million on

December 31, 1984, and fell to a negative $49 during 1985, a loss of over $300 million. The firm was probably still technically solvent when it filed for bankruptcy on April 16, 1985. However, the recorded book values undoubtedly overstated the economic value of the aging, obsolescent plants.

Bankruptcy Proceedings and Outcome

Wheeling-Pittsburgh filed for bankruptcy under Chapter 11 of the Bankruptcy Code on April 16, 1985. As of December 31, 1985, the date of the first audited evaluation of bankruptcy obligations, bankruptcy liabilities were $885 million, and the stockholders' equity deficit was $49 million.

The bankruptcy reorganization period at Wheeling-Pittsburgh has been marked by a high level of conflict between stakeholders and managers. After filing for bankruptcy, Wheeling-Pittsburgh demanded that employees take an 18% cut in pay. The union rejected the demand and after several weeks of unsuccessful negotiations went on strike. After 98 days of work stoppage, a settlement close to the firm's original demand was accepted by the union. As a part of the settlement, a joint union-management board to assure cooperation was established. In late 1985 Wheeling-Pittsburgh terminated its pension plan and transferred a portion of its liabilities to the Pension Benefit Guarantee Corporation, an action actively fought by the Pension Corporation. After

extensive litigation, Wheeling-Pittsburgh settled the case by agreeing to pay $85 million dollars against claims in excess of $500 million.

In the three years since filing for bankruptcy, Wheeling-Pittsburgh has shut down several old mills, written off overvalued assets, and disposed of unused property. Sales in 1985 were off by a third, much of the decrease due to lost production during the strike, but sales recovered in 1986 and have continued to increase. In 1986 operations were profitable, but large writeoffs led to a net income loss. In 1987 earnings were $8.43 a share, the highest since 1979 and the first profit since 1981. The recovery has been due to several factors. The steel industry has undergone a major turnaround as result of the lower dollar and increased demand in the automobile and other durable goods industries. Wheeling-Pittsburgh has been the beneficiary of reduced labor costs and increased efficiency. However, as in the case of all firms in bankruptcy, the results are not directly comparable with nonbankrupt firms, since interest on prebankruptcy obligations and some other expenses do not accrue during reorganization. The elimination of most pension obligations also was a factor.

The reorganization of Wheeling-Pittsburgh is still in progress in 1988, and a firm schedule for completion has not been established. Current estimates are that

Wheeling-Pittsburgh will satisfy some $900 million in creditor claims with about $300 million in cash and 30 million shares of common stock. Currently there are about 5.1 million shares of common stock, which has recently sold for about $13 per share. In the five years prior to bankruptcy, Wheeling-Pittsburgh stock sold in the $10 to $40 per share range, and in the $6 to $17 range during bankruptcy. If the current estimates of the reorganization outcomes are accurate, losses to stockholders will be significant, but not as catastrophic as in many bankruptcies.

Managerial Turnover

High rates of managerial turnover are characteristic of turnarounds, of which bankruptcy reorganization is a special case, and Wheeling-Pittsburgh is no exception. At the time of the bankruptcy filing, Dennis J. Carney was CEO. Carney had a doctorate in metallurgy from Massachusetts Institute of Technology and had worked for United States Steel from 1942 to 1974 with absences only for military service and graduate education. In 1974 he went to Wheeling-Pittsburgh as vice president for operations and became CEO in 1977. Carney was unpopular with labor and was forced out as CEO in 1985 in the midst of the strike protesting the wage cuts which followed the bankruptcy action. He was replaced by George A. Ferris as CEO and Allan E. Paulsen as Chairman of the Board. Ferris was a retired Ford Motor Company executive and had subsequently

served as Executive Vice President of NVF Corporation, another steel maker. Paulsen was the largest shareholder of Wheeling-Pittsburgh, holding 34% of the outstanding stock.

In January 1987 Paulsen sold his stake to a close friend, Lloyd C. Lubensky, President of Ryder System Inc., for a small fraction of its value. In March 1987 Lubensky became Chairman after a brief period during which Wheeling-Pittsburgh was headed by a committee made up of Lubensky, Ferris, and John P. Innes, a director. In April 1987 Ferris was replaced by William J. Scharffenberger, a turnaround specialist who had headed both Penn-Dixie Industries, a steel maker, and Saxon Industries, a paper products company, during their bankruptcy proceedings. Scharffenberger was also named President, filling a position which had become vacant when John D. Fry resigned after a salary dispute with Lubensky. Fry, who was 42, was the only young top executive at Wheeling-Pittsburgh. All the other senior executives were over 65 and either retired or still associated with other firms.

Discussion

The bankruptcy of Wheeling-Pittsburgh represents a classic case of the failure of a declining firm in a declining industry. The particular circumstances of that decline were described above. The bankruptcy of Wheeling-Pittsburgh is also consistent with the bankruptcy theory developed in Chapter 3.

According to that theory bankruptcy occurs when a firm is unable to meet the legitimate claims made on its outputs and there is no consensus among stakeholders as to the distribution of outputs and assets. Wheeling-Pittsburgh's large asset base had been built with heavy investments by stockholders and creditors. The decline of the industry had reduced the economic value of those assets, and the firm had allowed the productive assets to decay and become obsolescent. The economic and technological decline of the firm and industry was compounded by high labor costs. During and following World War II, when the steel industry was profitable and competition was restrained, the industry had accepted a labor structure with high wages and rigid work rules.

When good times turned to bad, the outputs available to meet legitimate claims declined more rapidly than the claims. Stockholders were the first losers. Dividends were suspended, which, combined with the declining value of the firm's physical assets, led to falling stock prices. Other claims were less easily scaled down. Unions fought vigorously to hold their share of the firm's outputs, both for wages and pension funding, preferred stockholders continued to get their dividends, and creditors were unwilling to give up their claims. The declining value of the assets added to the pressure on the firm to resolve conflicting claims, but also acted as a deterrent to action. The book value of assets exceeded their economic or market value, so any disposal

required accounting write-offs, which increased reported losses. Mortgages on the assets compounded the problems. If the assets were sold, debt had to be repaid and funds to do so were not available. On the other hand, the low real value of the assets deterred foreclosure by holders of secured debt. Unsecured creditors were reluctant to force bankruptcy once they believed that priority claims of secured creditors would probably exceed the amount available for distribution to all creditors.

The net result of these conflicting forces on the firm led to an impasse in which further drift and decline could only be broken by bankruptcy. However, choosing the bankruptcy option also presented problems. Although the situation was bleak the firm was not financially bankrupt under traditional technical definitions. The nature of the industry also made the decision more difficult. The industry was depressed and clearly had excess capacity, but the steel industry is so basic to the nation's economy that there were powerful forces to keep the industry and the major firms in it alive. The traditions of the industry were undoubtedly particularly strong for Carney, who had spent over forty years in the steel industry.

In the end, the decision to file for bankruptcy was made before the firm was technically bankrupt. The decision was made possible by the new Bankruptcy Code of 1978, which allowed greater flexibility than the old code. Also, Manville

Corporation and Continental Airlines had pioneered bankruptcy proceedings based on potential liabilities or the probability of bankruptcy under continuing obligations. Although the reorganization is not complete, the evidence to date suggests that the bankruptcy decision was value preserving. Perhaps it should have been made earlier. The bankruptcy costs, including the strike costs in 1985, have been high. A negotiated restructuring would have been less costly, but the level of conflict between the stakeholders was just too great for that alternative.

VITA

Wilbur N. Moulton was born in Winner, South Dakota, June 16, 1926. After attending rural grade schools, he completed high school in Reliance, South Dakota. In 1949 he graduated magna cum laude from Sioux Falls College, Sioux Falls, South Dakota, with a B.S. in Chemistry.

After one year as an industrial chemist, Moulton entered the University of Minnesota, Minneapolis, Minnesota, where he earned an M.S. in 1952 and a Ph.D. in 1954, both in Organic Chemistry. From 1954 to 1956 he was Assistant Professor of Chemistry at Morningside College, Sioux City, Iowa. From 1956 to 1972 he was at Southern Illinois University, Carbondale, Illinois, where he served in a variety of positions, including Professor of Chemistry, Assistant Dean of Liberal Arts and Sciences, Associate Dean of International Education, and Dean of Students. From 1972 to 1982 he was at Sangamon State University, in Springfield, Illinois, where he served as Assistant to the President and Director of Budget and Planning. In addition to these permanent positions, Moulton has served as National Science Foundation Consultant in Teacher Education, Central College, Bangalore, India; Ellis L. Phillips Foundation Intern in Academic Administration, Brown University, Providence, Rhode Island; and Smith-Mundt Visiting Lecturer in Chemistry, College of Science, University of Baghdad, Baghdad,

Iraq.

In 1982 Moulton took early retirement at Sangamon State University and entered the doctoral program in Business Administration at the University of Illinois in Urbana-Champaign. His major was in Strategic Management and Business Policy, and his minor was in Finance. Howard Thomas served as his major advisor and dissertation chairman. In 1987 Moulton joined the faculty of the University of Toledo, in Toledo, Ohio.

Moulton is member of number of professional associations, including the Academy of Management, the Strategic Management Society, and the American Association for Higher Education. His honorary societies and awards include Phi Kappa Phi, Phi Lambda Upsilon, Sigma Xi, First National Bank of Chicago Scholar, and Alcoa Foundation Fellow. He served in the U. S. Army from 1944 to 1947.

Moulton's academic publications and presentations in business include:

The Impact of Deregulation on Airline Profitability, presented at the Academy of Management Meeting, San Diego, CA, August 1985.

The Effects of Bankruptcy on Competitors and Industries, presented at and published in the Proceedings of the Midwest Academy of Management Meeting, St. Louis, MO, April 1986.

Market Structure Analysis: A Boolean Factor Analytic Approach and Empirical Example (with Thomas S. Gruca and D. Sudharshan), presented at and published in the Proceedings of the American Marketing Association Meeting, Toronto, Canada, August 1987.

Bankruptcy as a Deliberate Strategy by Troubled Firms (with Howard Thomas), presented at the Strategic Management Society Meeting, Boston, MA, October 16, 1987.

Business Failure and Bankruptcy Models, (with Howard Thomas), presented at and published in the Proceedings of the Midwest Academy of Management Meeting, Toledo, OH, April 1988.

The Effects of Bankruptcy on Competitors and Industries, (with Howard Thomas), presented at and published in the Best Papers Proceedings of the Academy of Management Meeting, Anaheim, CA, August 1988.