



Strategy and Bankruptcy: An Exploration into Organizational Death

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Because an organization's existence is a prerequisite for its accomplishments, one would expect that researchers would be intensely interested in those factors which could lessen the likelihood of organizational decline and failure. Yet, until recently little research appeared regarding this topic and very little of it focused on the effectiveness of strategy on the likelihood of corporate bankruptcy. This research will review some of the strategy variables and investigate avenues that are most likely to hold the greatest potential for altering a firm's likelihood of failure. An exploratory model was developed to study the effects of corporate and business level strategies, as well as cooperative interorganizational and financial strategies. A consistent, significant positive relationship was discovered between survival and a firm's number of interorganizational linkages in the form of director interlocks. A consistent, significant negative relationship was discovered between survival and a firm's financial leverage. It was also discovered that as failing firms move closer toward bankruptcy they exhibit a degree of isomorphism with their surviving counterparts regarding certain interorganizational arrangements. That such changes in the interorganizational arrangements of failing companies do little to help save them suggests that turnaround efforts must start early in a firm's decline if it is to overcome the substantial amount of organizational inertia present in the corporation.

The assets of publicly traded corporations that filed for bankruptcy in 1990 totaled over \$80 billion dollars (Sherman, 1991). If all these companies were merged together into a single corporation, it would rank sixth in asset value in the Fortune 500—displacing Phillip Morris and ranking just behind Exxon and IBM (“Fortune 500”, 1991). One would expect that a topic involving so much wealth and dealing with the critical issue of organizational life and death, would be of great importance to researchers. Yet, it was the mid 1960s before finance researchers systematically studied failure (Beaver, 1967) and developed multivariate failure prediction models (Altman, 1968).

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It was the late 1970s before management researchers began empirical study on the topic of organizational decline and failure. Whetten (1988, 39) noted that: "Probably the most under studied aspect of the growth and decline process in organizations is organizational death." Similarly, Cameron, Sutton & Whetten (1988, p. 5) reported that: "Approximately 75% of academic literature on organizational decline has appeared since 1978." The bulk of the literature (see Whetten, 1988 for review) that has appeared, though it is informative, has some limitations (Hambrick & D'Aveni, 1988). Principle among these problems is that most studies involve organizations which may be subject to substantial liabilities of newness or smallness (see Stinchcombe, 1965, Hannan & Freeman, 1977, Singh & Lumsden, 1990). The conclusions of such studies may thus be inappropriate for the managers of larger, on-going business concerns. Yet, the research in the area is desired. Strategic managers—those managers responsible for the well being of the entire organization—list the survival of their organization as their principle concern (Donaldson & Lorsch, 1983, p. 29).

There are, however, a few recent studies regarding strategic factors which may prevent or delay organizational decline and death in larger, on-going business concerns. Principle among these is the recent work by D'Aveni (1987, 1989a, 1989b) and Hambrick & D'Aveni (1988). Their work is primarily concerned with the effect financial resources, managerial attributes, and movements by an organization into and out of different industries had on an organization's failure likelihood and rate of decline. Like D'Aveni, Keasey & Watson (1987)—building on earlier more anecdotal work by Argenti (1976)—found that corporate bankruptcy was related to management attributes and the organization's responsiveness to environmental change. This present study intends to add to the present body of strategy research dealing with corporate failure by bringing together research streams dealing with corporate level, business level, cooperative interorganizational, and financial strategy and investigating their impact on firm failure likelihood. Thus, the principle research questions the present study seeks to explore are: (1) whether strategy factors are related to an organization's likelihood of demise or survival; and (2) if strategy factors are important in this context, which factors are most important? In order to accomplish this, several cross-sectional samples of failed and non-failed firms will be studied.

Organizational Death

The most straightforward way to define organizational death is to simply say that the organization dies when it stops performing those functions we would expect from it. While definitions of organizations are numerous (Hall, 1987), a general definition of an organization and the functions its perform might be as follows: *Organizations are systems of activity in which the efforts of coalitions attempt to accomplish a set of goals that include the preservation or survival of the system; goal accomplishment depends significantly upon obtaining resources from an environment that the organization does not entirely control.*¹ Thus, an organization dies when the systems upon which interactions were based

cease their functioning in a critical way, essential coalitions abandon the organization and important goals cannot be achieved because the environment does not grant the resources necessary for survival. In other words, a working definition for organizational death could be a *critical and irreversible loss by the system*. "Critical loss" meaning the loss in the ability to determine whether one's existence will continue (in the case of a business enterprise this would be the loss of the ability to control whether the organization liquidates). Such loss of control can occur when the organization is either purchased or is subordinate in a merger (Carroll & Delacroix, 1988).

Defining organizational death is not all that straightforward. To continue with the above merger example, Carroll & Delacroix (1988, p. 180) argue: "When two organizations combine, at least one ceases to exist and this must be considered a death. If a merger involves a dominant partner... then the subordinate organization dies..." In the latter type of merger, the subordinate organization dies because essential coalitions have abandoned the organization and systems upon which interactions were previously based cease to function in a critical way. In other words, the previous owners have sold the entity and there is a critical change for both internal and external coalitions in their scope and degree of ability to impact the system of interactions.

A more drastic form of critical loss occurs when the firm moves into bankruptcy, with two principle differences. This first, and more minor difference, is that in a merger ultimate control shifts from one equity owner to another, in a bankruptcy ultimate control shifts from one equity owner to the bankruptcy court and a group of managers and creditors (Bradley & Rosenzweig, 1992). Second, and more important, in a merger one critical coalition does obtain critical resources which achieve a goal—shareholders of the dying firm obtain some form of wealth maximization—particularly given the acquisition premiums seen in recent years (Black, 1989). In a bankruptcy, almost none of the previously involved coalitions are able to achieve any of their goals (Sheppard, 1992; Moulton & Thomas, 1993). So not only does bankruptcy involve the critical loss of a merger but it also negatively impacts the goals of most of the coalitions (stockholders, creditors, workers, etc.). Thus, bankruptcy means that the organization stops performing most all of those functions we would expect from it, which clearly meets our definition of organizational death. Therefore, organizational death will be defined here as bankruptcy, i.e. filing of the petition to take the company into Chapter 11 bankruptcy.

Organizational Death and Strategy Related Factors

Given the not unreasonable assumption that the strategic managers in a corporation may wish to postpone the decline and eventual demise of their organization (Amihud & Lev, 1981), what can they do to evade this eventuality as long as possible? In other words, what are the differences between failing firms and healthy ones regarding important strategic factors? This research will study four principle elements of strategy: (1) corporate level strategy; (2) business

level / market share strategy; (3) cooperative / collective / networking strategy and; (4) financial strategy. Selection of these strategies was based on two factors. First, like Hambrick & D'Aveni (1988), the present study focused on externally visible characteristics rather than internal processes due to the nature of the available data. Second, these factors, as will be seen, are ones commonly cited as critical in the literature.

Corporate Level Strategy

Corporate-level strategy deals with issues regarding "the domains in which the firm will operate (Hax & Majluf, 1984)." Corporate-level strategy may also involve choosing the businesses (i.e. industries) and markets (i.e. national markets) in which a firm will compete (Hill & Jones, 1992). A firm's selection of industries is of great importance for two reasons. First, there is a high degree of correlation between industry structure and firm performance (e.g. Scherer, 1980; Ravenscraft, 1983; Schmalensee, 1985) which logically transfers into survival likelihood (Drucker, 1970). Second, reducing industry effects to reduce failure likelihood is often cited as a reason for a firm moving into a wide range of industries (e.g. Weston & Mansinghka, 1971; Pfeffer & Salancik, 1978; Amihud & Lev, 1981). Thus the aspects of corporate-level strategy studied here are the degree to which the corporation diversifies into different businesses and the ability of those industry environments to support the corporation.

Diversification can be thought of as a method to dilute potential threats in any one particular environment in which a business may be involved (Thompson, 1967; Pfeffer & Salancik, 1978; Kotter, 1979). A firm may thus protect itself from adverse changes in its historic markets via a strategy of diversification (Weston & Mansinghka, 1971). Through diversification an organization can reduce its reliance on any one domain of activity and thus reduce the chance that a market downturn in any one market will greatly impact the firm's chance for survival (Amihud & Lev, 1981). Thus, one could hypothesize:

H1a: *The level of diversification possessed by a firm is a statistically significant attribute in categorizing failed from non-failed firms; failed firms are less diversified than non-failed firms.*

Environments into which the corporation diversifies also play an important role. Population ecology theory argues that organizational survival is primarily dependent upon environmental forces and firms are either selected out of the population or allowed to survive depending upon whether or not the firm fits the environment and is able to obtain resources from it (Singh, House & Tucker, 1986). Various researchers in industrial economy have, beginning with Bain (1956) and continuing into the present (Vernon, 1972; Scherer, 1980; Ravenscraft, 1983; Schmalensee, 1985), confirmed the relationship between industry structure and firm performance. Schmalensee (1985) found that industry effects account for better than 75% of the variance in company rates of return. Pfeffer & Salancik (1978) tell us that if resources in a corporation's

environment are scarce, conflict between organizations dependent upon that environment will increase. Such conflict, in the form of increased competition, will put financial pressures upon firms and will thus reduce their chance for long term survival. Witness the increased number of failures in the airline industry brought on by increased competition. Two general indicators of industry effects on the survivability of the corporation are industry profitability and growth.

Industry profitability gives an indication as to the degree to which resources—e.g. revenues—will be made available to the firm. Firms in higher profit industries can be expected to be more profitable (Lieberson & O’Conner, 1972). Thus, one would expect to find that failing firms are in less profitable industries than non-failing ones. Such an expectation will mean, for example, that firms in a profitable industry will be better able to acquire investment capital than firms in less profitable industries (since creditors will view loan repayment as more likely). Industry profitability can also be used to summarize a number of industry effects (Hansen & Wernerfelt, 1989). Thus, we could hypothesize:

H1b: *The profitability of the industries in which a firm operates is a statistically significant attribute in categorizing failed from non-failed firms; failed firms operate in less profitable industries than non-failed firms.*

Industry growth rate gives an indication as to the degree to which the organization is likely to be able to acquire resources in the future without coming into conflict with other corporations in the same environment. Thus, firms in higher growth industries would, for example, be able to increase sales without stealing market share away from others (Porter, 1980, p. 18). Since conflict between firms is reduced, downward pressure on profits is less likely and firms will be more likely to survive. Industry growth is also a significant factor in a firm’s decision whether to enter or remain in an industry (Hambrick, MacMillian & Day, 1982). While the importance of this measure cannot be ignored (hence its inclusion here), it must be noted that the relationship to firm failure is not all that certain. Hambrick & D’Aveni (1988) found little relationship between industry growth and firm survival. However, the Hambrick & D’Aveni (1988) results seem more the exception than the rule. Thus, we may hypothesize:

H1c: *The rate of growth of the industries in which a firm operates is a statistically significant attribute in categorizing failed from non-failed firms; failed firms operate in lower growth industries than non-failed firms.*

Business Level / Market Share Strategy

Business level strategy generally refers to “how a company can compete effectively in a business or industry (Hill & Jones, 1992).” In describing a business level strategy one might use a topology like Porter’s (1980) generic

business-level strategies. While topologies can sometimes be quantified (e.g. see Montgomery's, 1982, discussion of the Rumelt, 1974, diversification topology) they can also be somewhat subjective (e.g. see Hambrick & D'Aveni's, 1988, discussion of Miller & Friesen's, 1977, archtypes). Thus, business level strategy will be defined here in a more quantifiable way: primarily as market share and secondarily as firm size. Not only does Porter (1980) stress the use of market share a generic business-level strategy but market share is also important at the corporate level for portfolio management (Boston Consulting Group, 1972), and for general firm profitability (Buzzell, Gale & Sultan, 1975). Firm size may also contribute to the firm's ability to manipulate its exchange relationships with other organizations (Pfeffer & Salancik, 1978; Kotter, 1979).

Market share, and its attainment can be of critical importance to the firm several reasons. First, in order for the firm to remain cost competitive (e.g. through the realization of experience curve effects), large sales volume is required (Boston Consulting Group, 1972). Second, companies with large market shares may be in a better position to control the industry through their market power, particularly in markets that are more concentrated (Pfeffer & Salancik, 1978). Being a powerful firm in a concentrated industry allows a company to keep revenues high via price setting, i.e. exercising price leadership (Schelling, 1960). Lastly, in a more general sense, market share has been found to heavily impact a firm's profitability (Buzzell, Gale & Sultan, 1975). Profitability, in turn, is necessary for the long run survival of the firm (Drucker, 1970). Therefore, one would hypothesize:

H2a: *The market share a firm possesses in the industries in which it operates is a statistically significant attribute in categorizing failed from non-failed firms; failed firms have lower market share than non-failed firms.*

One could make the point that market share might also be a performance measure or goal (Hill & Jones, 1992). Thus a relationship between market share and organizational survival would be obvious. Such an argument is certainly plausible but does not mesh exactly with some of the findings to be covered later in this paper (see the discussion regarding Table 4, below).

In addition to market share, firm size may be a second related variable of some importance. Firm size may also contribute to the firm's ability to manipulate its exchange relationships with other organizations (Kotter, 1979). Firm size also relates to executive prestige (Pfeffer & Salancik, 1978) and executive prestige has been found to have significant impact upon survival (D'Aveni, 1989a).

Firm size, in addition to market share, may be a second related variable of significant importance. Finance literature has long been concerned with attempting to control for firm size effects (e.g. see Altman, 1968) even though the degree of control possible is questionable (e.g. see Betton, 1990). Firm size has also found to be related to executive prestige (Monsen & Downs, 1965; Pfeffer & Salancik, 1978) and executive prestige has been found to have

significant impact upon survival (D'Aveni, 1989a; Sheppard, 1989). The population ecology literature has labeled the role size can play in an organization's likelihood of survival "the liability of smallness" (Singh & Lumsden, 1990). Therefore:

H2b: *The size of a firm is a statistically significant attribute in categorizing failed from non-failed firms; failed firms are smaller in size than non-failed firms.*

Cooperative / Collective / Networking Strategy

In contrast to the competitive strategies discussed above, cooperative, collective or networking strategies imply that sets of organizations attempt to manage their interdependence in various ways (Astley & Fombrun, 1983; Thorelli, 1986; Bresser, 1988). Such attempts can take the form of contracting through mergers or joint ventures, interlocking directorates, trade associations, industry leadership or even industry prompted regulation (Bresser, 1988). Whether these relationships are called cooperative (Harrigan, 1988; Neilsen, 1988), collective (Astley, 1984; Bresser, 1988) or networking (Thorelli, 1986; Jarillo, 1988) they are all attempts by organizations to influence the behaviors of others in their environment (Bresser, 1988). Two aspects of these arrangements will, for reasons discussed below, be studied here: board of directors relationships and joint ventures.

Board interlocks provide a method by which a firm can acquire managerial expertise and information about the environment (Pfeffer & Salancik, 1978; Bresser, 1988). Interlocks may also work to co-opt board members such that it becomes easier for the firm to acquire resources or legitimacy (Selznick, 1949; Thompson, 1967; Kotter, 1979; Pennings, 1980; Burt, 1983). For example, the company's banker may be brought on to the board in order to make him or her less resistant to extending funds to the firm. Managers who sit on the boards of other corporations have also been found to aid in firm survival (D'Aveni, 1987, 1989a; Sheppard, 1989). Therefore:

H3a: *The number of director interlocks a firm possesses is a statistically significant attribute in categorizing failed from non-failed firms; failed firms have fewer director interlocks than non-failed firms.*

Director interlocks, though useful, are not sufficient to describe adequately the extent of the interlock (Pennings, 1980). Thus, an additional measure is included which corresponds to the relative degree of interlocks a firm may maintain: the percentage of outside directors.

The percentage of outside directors would provide an indicator of the board's orientation toward its external environment (Sheppard, 1989) and thus its likely ability to adapt to change. Outside directors are classified as those directors who are not employed by the organization, are not officers or directors of subsidiaries or parent organizations, and are not retired officers of the corporation (Pennings, 1980, p. 63). Directors, in general, are charged with

looking over management's shoulder to ensure the company is being run properly. Inside directors, therefore, are seen as having a conflict of interest between management and shareholder views (West, 1985). Conversely, outside directors are seen as being better able to oversee the company objectively (Zahra & Pearce, 1989). Since one of the perceived functions of outside directors is to insure the long run survival of the organization (West, 1985), one would expect failed companies to have significantly fewer outsiders on their boards. Thus, one could hypothesize:

H3b: *The percentage of outside directors on a firm's board is a statistically significant attribute in categorizing failed from non-failed firms; failed firms have a lower percentage of outside directors than non-failed firms.*

Joint ventures, or ties through ownership, occur when two or more organizations create a new entity in order to share risk or cost. This represents a way for firms to create strategic alliances and so acquire information and/or co-opt resource providers or potential rivals (Burt, 1983; Hamel, Doz & Prahalad, 1989). Though the type and importance of joint ventures may differ from industry to industry (Harrigan, 1988), in general it is expected that:

H3c: *The number of joint ventures in which a firm is involved is a statistically significant attribute in categorizing failed from non-failed firms; failed firms have fewer joint ventures than non-failed firms.*

Financial Strategy

One may look at the firm's financial strategy as the pattern of investments the firm makes (Hill & Jones, 1992). Such a pattern of investment could involve tight or loose cost controls regarding production, inventories, marketing expenses, equipment purchases, financing, etc. Part of this pattern involves decisions which concern the degree of "slack" the organization will maintain. What researchers have labeled "organizational slack" (Cyert & March, 1963) can be used as a general indicator of the surplus resources an organization maintains (Bourgeois, 1981; Hambrick & D'Aveni, 1988). These resources can be found in the form of "unabsorbed slack" or "absorbed slack" (Singh, 1986; Hambrick & D'Aveni, 1988). The former includes "excess, uncommitted liquid resources," that could be better utilized, and the latter, "excess costs" which could be cut (Hambrick & D'Aveni, 1988). Firms' suffering from a lack of slack resources—i.e. firms likely to be failing—may have an increased chance for managerial paralysis or rigidity in the face of environmental change (Smart & Vertinsky, 1977; Staw, Sandelands & Dutton, 1981). In the face of such change, this paralysis or rigidity may mean proper corporate responses do not occur with sufficient speed to save the organization (Argenti, 1976).

In addition to the strategic aspects of a firm's financial resources, the financial literature also provides a long and extensive background regarding

research on corporate bankruptcy (e.g. Chen & Shimerda, 1981; Zavgren, 1985). Financial approaches to organizational demise typically employ a cash flow analysis or financial ratio analysis as predictive indicators of the firm's likelihood of failure. Such financial ratios would also be indicative of organizational slack. Predictive models are usually developed from these financial ratios using a test of means (Beaver, 1967), multiple discriminant analysis (e.g. Altman, 1968; Aziz, Emanuel & Lawson, 1988) or LOGIT analysis (Zavgren, 1985). Therefore:

H4: *The present level of financial resources possessed by a firm will be a statistically significant attribute in categorizing failed from non-failed firms; failed firms will be found to possess fewer financial resources than non-failed firms.*

The above set of strategic factors is not intended to be an exhaustive list regarding strategic factors possibly related to firm failure. However, it does give us a fairly broad range with which to begin our exploration of the topic.

Research Methodology

Given the above hypotheses, the next issue to be addressed is the selection of a sample. After sample selection, operationalization of variables and data collection will be discussed. Finally, we will look at the types of statistical analyses employed to test the hypotheses.

Sample Selection

A sample of failed firms was gathered by scanning *Commerce Clearinghouse Capital Changes Reporter* for companies which declared bankruptcy during the period 1980 to 1987. The bankruptcy law was significantly overhauled in the late 1970s and the effect of the new law may be significant (Bradley & Rosenzweig, 1992). Due to this change in the law (which went into effect in late 1979) bankruptcies prior to 1980 were deemed unsuitable for study. Moody's manuals and Dun's Million Dollar Directory were employed to ensure that failed firms present on the list generated were not start-up companies. Such start-ups are subject to the peculiar problems of new companies (Singh & Lumsden, 1990). Therefore, selected companies had to have more than 100 employees and be in existence more than five years prior to the target year.

In order to control for the effects of regulation that can also effect the firm's likelihood of survival (Owen & Brautigam, 1980), firms that were in heavily regulated or recently deregulated industries were eliminated from consideration. Heavy industry regulation or a change in the level of industry regulation would be an added factor affecting the likelihood of firm failure (Owen & Brautigam, 1980). Eliminated firms were those involved primarily in transportation, telecommunications, utilities, banking, insurance, medical practice, and legal practice (SIC Code Groups 40-42, 44, 48-49, 60, 63-64 and 80-81).

An equal number of non-failed firms were selected. This sample of surviving firms was selected from, and checked against, the same sources as

above. Small, very young and highly regulated companies were again eliminated. In addition, firms were matched by age such that the mean age of firms in any sample of survivors did not differ significantly from the mean age of any sample of failures.

It must be noted at this point that sampling procedures in which selection is based on the dependent variable (in this case failure) may result in biased estimators, and thus “any results must be taken as suggestive rather than definitive” (Hambrick & D’Aveni, 1988, p. 7). However, the use of such methods in failure research, other organizational research and even epidemiological research (for further discussion see Schlesselman, 1982; Seabright, 1987 or; Sheppard, 1989), as well as the exploratory nature of the present study, support the use of such sampling techniques.

Controlling for the effects of confounding factors can be accomplished through a matching process (Seabright, 1987). Important among the effects for which to control in failure studies are those related to the liabilities of newness and smallness (Singh & Lumsden, 1990) and effects of industry differences (Hambrick & D’Aveni, 1988). Not all the effects of the liabilities of newness and smallness can be completely eliminated by removing newer and/or smaller firms (Singh & Lumsden, 1990). Thus, there may be a need to match on one of these variables. Yet the ability to objectively control for all these possible confounding factors may be difficult. For example, in trying to control for both industry and size differences, the best match may still result in differences in size of more than an order of magnitude between the failed and surviving firms (e.g. see Betton, 1990). The liability of newness may be partially controlled by eliminating younger firms (Moulton & Thomas, 1988; Sheppard, 1989), but this is not often done explicitly (the elimination of smaller firms may accomplish a similar function). Finally, objective matches of failed and non-failed firms may be difficult. Hambrick & D’Aveni (1988) employed an expert three judge panel to evaluate potential matches in their failure study and all three judges agreed in less than half the cases.

In the present study, controls were put primarily on age rather than industry differences. There are several reasons for this. First, there is logically some relationship between age and size and the controlling of one may aid in controlling the other. Second, age is quantifiable and the variable can be employed to objectively match firms. Finally, by employing statistical controls—that is entering variables representing age, size and industry differences into the model directly—any residual effects of these factors will be addressed (i.e. adding these variables into the statistical analysis will permit us to observe what effects they have on the likelihood of firm survival). Though even without matching procedures there is some support for use of a non-failed random sample (Zmijewski, 1984). Results of tests employed using a non-failed random sample may not differ significantly from a matched pair study (Zmijewski, 1984; Hambrick & D’Aveni, 1988).

The list of firms gathered is included in Appendix 1. The sample of firms is not a single sample but rather a set of five samples which differ based on time horizons. Each of the five samples contain 56 firms—half failures and half

survivors—for a total number of firms in the study of 280. The firms in each sample are to be employed in models to differentiate failures from survivors one to five years in the future. This technique is explained more fully in the next section.

Time Horizons

The sample of firms is not a single sample but rather a set of five samples of cross sectional data with differing time horizons. The firms in each sample were employed in models to differentiate failures from survivors one to five years in the future. For example, sample Year 1 data about the firm's operations would reflect the firm's condition one calendar year prior to the target year; for failing firms the target year would be the year in which the bankruptcy petition was filed, for surviving firms simply a one year lead time. For Year 2 firms the data would reflect the firm's condition two calendar years in advance and so on. Appendix 1 contains the list of firms in the sample listed by year and in ascending age order. The sets of cross-sectional data were employed to give some insight into possible ways in which firms change as they approach failure. One way to look at this is to view the sample as one which has been stratified by year because temporal distance from bankruptcy is an important factor which may impact other variables under study (Howard; 1985; Zavgren, 1985). However, one might argue that any possible conclusions concerning how these firms change as they approach failure might be simply the result of peculiarities in the samples. Thus a small sub-sample of firms using multiple year data was also employed to confirm the initial results (see "Tests of the Models").

A final point about the relevant time frame should be mentioned. A major part of this study employs data from the TRINET database. (For an detailed discussion of the database see Davis & Duhaime, 1992). Since TRINET data could be only obtained for the years 1977, 1980 and 1982 the data used in this research will be drawn from those three years. Thus, bankruptcies occurring in certain years and employing a certain time horizon will use a particular year from which to draw data. For example, if we wanted to predict failure three years in advance, we would look at firms which went bankrupt in 1980, 1983 and 1985, and employ data from the years 1977, 1980 and 1982 respectively.

Operationalization of the Variables

Diversification was measured by a Herfindahl index (Jacquemin & Berry, 1979). This index is a weighted average formula of the type employed by Dess (1980), Montgomery (1982), and Dess & Beard (1984). Industry is defined by the four-digit SIC system. Diversification was calculated by the square of the sales in each of the firm's industries over the square of the total amount of firm sales. The weighted average ratio using the SIC system has been employed previously in several studies (Dess, 1980; Montgomery, 1982; Dess & Beard, 1984) and is comparable to the widely used Rumelt topology (Montgomery, 1982).

Industry profitability was measured by the firm's Return on Equity (ROE) for each of the industries in which it was active. Industry profitability was

calculated as a weighted average (by revenues) of all the firm's four-digit SIC code businesses. For example, if 1/3 of a firm's revenues came from an industry having an industry average ROE of 12% and 2/3's of its revenues came from an industry having an industry average ROE of 6%, then the firm's industry ROE would be 8% ($1/3 \times 12\% + 2/3 \times 6\%$). Such weights have been employed previously in several studies (Dess, 1980; Montgomery, 1982; Dess & Beard, 1984). ROE also plays a significant role in prior bankruptcy studies (Altman, 1968; Altman, Haldman & Narayan, 1977). Industry ROE was adjusted to account for variations in interest rates which occurred during the period of study (see Appendix 2 for details).

Industry growth rate was measured via the weighted average of sales growth rate over five years for each of the industries in which the firm does business will be employed (please see Appendix 2 for details of this calculation). The weighted average by four-digit SIC code was again employed to calculate the firm's industry growth rate. Growth rate was adjusted for inflation (using the G.N.P. Deflator) so as to make the figures comparable across years. Sales growth using the four-digit SIC system has been used in several previous studies (e.g. Shepherd, 1972; Bass, Catten & Wittink, 1978). Industry variables such as industry growth rate have also been employed in studies of firm decline to measure environmental carrying capacity by Hambrick & D'Aveni (1988) and D'Aveni (1989b). While Hambrick & D'Aveni (1988) employed just the largest two industries in which the firm did business, the TRINET data allows us to calculate a weighted average for all the firm's industries. This level of precision should give a better representation of the unique set of environments in which the firm might find itself.

Market share was the firm's market share in a particular four-digit SIC code industry over the sum of the market shares of the largest four firms in the industry, i.e. the four firm concentration ratio (please see Appendix 2 for details). This relative market share measure (as it is called) has been used in previous studies by Shepherd (1972) and by Hansen & Wernerfelt (1989). The market share for a firm is measured as a weighted average of relative market share for each of the industries in which the firm does business. The four-digit SIC system was also employed to calculate the firm's relative market share.

Firm size is typically operationalized by assets and/or annual sales (Burt, 1983). However, the logic behind including firm size in this analysis was to measure the firm's ability to use its size to manipulate its exchange relationships with other firms. This being the case, annual sales becomes the more logical choice for a measure of size since most of a firm's exchanges are due to its sales. Thus, the log of inflation adjusted sales was employed as a measure of size. Use of logarithms is typical of this type of measurement (Christensen & Montgomery, 1981). The G.N.P. deflator was used to adjust for inflation since it is the most widely based price index (Dornbush & Fisher, 1984).

Board interlocks were calculated to be the number of direct director interlocks adjusted for by firm size. Director interlocks come in two basic forms, direct and indirect. "A direct interlock exists when one individual is a director of two organizations... an indirect interlock exists when two organizations are

linked by a path through one or more third organizations...” (Pennings, 1980, p. 37-38). Indirect interlocks are of questionable value since information transmitted through them is likely distorted and an “indirectly linked director’s attention is much more diffused than that of a directly linked director” (Pennings, 1980, p. 37-38). For these reasons (as well as the practical difficulties involved in uncovering indirect interlocks), this study looked only at the number of direct interlocks possessed by a firm. Since indirect interlocks are of questionable value, restricting the study should not seriously impact the validity of the interlock measure.

Because the number of interlocks possessed by a firm is likely to correlate to its size, the firm interlock measure was standardized by taking the number of firm interlocks and dividing it by the firm’s sales size measure. Thus, firm interlocks equals the total number of direct director interlocks on the firm’s board over the log of firm sales size. Without this correction there would likely be sufficient multicollinearity to prohibit successful employment of some of the LOGIT analyses that will be employed (see “Testing” below). However, such a correction may reduce the differences between failed and surviving firms for the director interlocks variable. This would result in a decreased likelihood of rejecting the null hypothesis. In other words, we would be less likely to find support for the hypothesis that there is a difference between failed and surviving firms concerning interlocks when one does exist. This is a less serious error than not rejecting the null hypothesis when it should be rejected. Thus, given the demands of the statistical analyses, and that the type of likely error is the less serious one, a size correction is justified.

The percentage of outside directors was calculated simply as the number of outside directors over the total number of directors (as represented by a percentage).

Joint venture activity was measured by the number of joint ventures in which the organization reported it was currently engaged.

Financial resources can be defined as anything from human resources to net present value of expected future revenues. One way of looking at what resources are possessed by a firm is to look at the firm’s current financial condition (Ijiri, 1970). The level of resources a firm possesses may be captured by measuring working capital, cash, or even potential cash flows. In the broadest sense it is the net worth or equity of the corporation that becomes the base from which management tries to keep the firm going. Since net worth can vary greatly relative to the size of the firm it is necessary to standardize net worth. The broadest measure of resources is total assets. The ratio of net worth over total assets was used as the measure of a firm’s resource base. For financial institutions, net worth over total assets is also a general indication of solvency (Mun & Garcia, 1983). Chudson (1945), Pinches & Mingo (1973) and Chen & Shimerda (1981) also mention net worth over total assets as an important, useful ratio.

Failure was defined, as discussed above, is the filing of the Chapter 11 bankruptcy petition. Failures were coded as “0”s, survivors as “1”s.

Age of the firm was the number of years since the organization was founded.

Data Collection

Data for each of the selected firms came from several sources. Annual reports, 10Ks and proxy statements were employed to calculate the number of interlocking directorships, outside directors, joint ventures and firm size. Industry growth rates and four-firm concentration ratios (to calculate relative market share) were obtained from the U.S. Department of Commerce Census Data. Industry profitability figures were obtained from Dun and Bradstreet's *Key Business Ratios*.

The TRINET database was used to obtain firm diversification and market share data. In creating industry averages TRINET was also used to determine the four-digit SIC industries in which a firm was involved. According to Davis and Duhaime (1992) there are pros and cons to employing TRINET data as has been done here. They support the use of this data with census data to develop industry benchmarks. However, because TRINET estimates market share by multiplying number of employees by the industry average shipments per employee, efficiency differences between firms are ignored. Ignoring such differences would overstate the market share of less efficient firms (for present purposes these are likely to be failing firms) and understate the market share of more efficient firms (i.e. surviving firms). Thus, we are likely to make the non-serious error of accepting the null hypothesis (that there is no significant difference between the market shares of failed and surviving firms) when we should not. Lastly, while Davis & Duhaime argue that TRINET data may not be as valid as COMPUSTAT II data for measuring vertical integration and relatedness, they present little evidence that it is invalid to use this data to measure diversification at the four digit level (as is done here with a Herfindahl index).

Testing

In order to differentiate between bankrupt and non-bankrupt companies the appropriate testing methods are either discriminant analysis or LOGIT analysis (Cox, 1970). Discriminant analysis is a linear method used for dividing normally distributed populations and LOGIT is a non-linear method which does not assume normality. To test the model, a LOGIT analysis was employed since initial analysis employing a Kolmogorov-Smirnov Goodness of Fit test disclosed that the distribution of observations regarding some of the variables differed significantly from a normal distribution. LOGIT analysis is viewed as being more robust (and thus considered more reliable) than discriminant analysis when dealing with samples which are not normally distributed (Lo, 1986). Although, researchers have found that discriminant and LOGIT analysis give approximately equivalent results (Gentry, Newbold & Whitford, 1985; Lo, 1986) discriminant analysis has advantages for clarity of presentation (Gentry, Newbold & Whitford, 1985). Ideally, one might employ a survival analysis. The cross-sectional nature of the data did not, however, support the use of this method (Morita, Lee & Mowday, 1989).

Three phases of LOGIT runs were performed. In the first phase, half the pairs from each sample year were randomly selected for use in developing an overall model, the other half for use in a hold out sample. The LOGIT model developed was then employed to see how accurately it predicted—both with regard to pairs selected and the pairs in the holdout sample. In a second phase of testing LOGIT models were developed for each of the five years of data. Since each of these samples only included 56 firms (28 failing and 28 non-failing firms) a split-half confirmation of the models predictive validity was not possible. Instead, a jackknife procedure was employed in order to test the reliability of the predictions (Sharma & Giaccotto, 1991). Though such a procedure is more commonly associated with discriminant analysis (Crask & Perreault, 1977) it can also be applied to LOGIT analysis (Gong, 1986). A third phase of the exploratory study was then conducted. For this phase, data on 80 firms (40 failing and 40 non-failing firms) was obtained. The data on the firms covered two periods of time. The objective of this research phase was to study how the models and variables had changed over time and to insure that the patterns spotted in the first two phases of the research were not anomalous (a jackknife procedure was again performed to insure the models' predictive validity).

Results

Table 1 displays summary statistics from the pairs selected from each sample year for later development of the predictive model. T-test results included in Table 1 demonstrate that surviving firms had statistically significantly higher relative market share, sales size, director interlocks and equity over assets. However, since T-tests are independent measurements of the differences in means of each group, we cannot determine, *ceteris paribus*, what they contribute to the firm's likelihood of survival or failure. For this task we turn to the LOGIT model.

Table 2, below, represents the results of the LOGIT analysis for an overall predictive model employing pairs selected from each sample year. Also shown are the predictive accuracies for the sample employed and for the hold out sample. Cutoffs for predictions in the LOGIT model were made at the .5 level (i.e. if the LOGIT analysis indicated that the firm had less than a .50 chance of survival, then it was considered to be predicting a failure; more than a .50 chance of survival, then it was considered to be predicting a survivor). The model's predictions were—both for the sample employed and the one held out—approximately 73% accurate. The Chi-squared statistic demonstrates that there was less than a .0001 chance that such a level of accuracy in the results could have occurred by chance.

Three variables in this first analysis appear to be important in this model: relative market share ($p < .1$), board interlocks ($p < .1$) and net worth to total assets ($p < .001$) all are significantly higher for surviving firms than for failed firms. However, if there are substantial changes over time in the variables considered, then we might find that certain variables take on greater importance

Table 1: Summary Statistics

	Survivors		Failures		T-Test	Correlations (.01 Sig. > .279)															
	Mean	S.D.	Mean	S.D.		1	2	3	4	5	6	7	8	9	10						
N = 140																					
1 Divers.	0.41	0.32	0.35	0.28	1.22																
2 Ind. ROE	8.10	5.87	8.90	6.17	-0.79	.036															
3 Ind. Growth	0.11	1.43	0.17	0.39	-0.33	.070	.246														
4 Mkt. Share	10.50	11.68	5.57	7.19	3.01	.091	-.047	-.028													
5 Sales Size	2.29	0.77	1.99	0.54	2.65	.310	-.143	.037	.456												
6 Interlocks	5.05	4.43	2.87	2.38	3.62	.324	.208	.017	.047	.299											
7 Outsiders	59.17	16.09	58.67	20.33	0.16	.108	.040	-.064	.111	.011	.365										
8 Joint Vent.	0.11	0.44	0.10	0.54	0.17	-.015	-.139	.203	-.112	-.011	-.073	.046									
9 Equity/A.	47.54	18.39	27.77	22.44	5.70	-.083	.183	.103	.013	-.112	-.110	-.229	-.104								
10 Firm Age	39.03	23.72	35.56	28.78	0.78	.253	-.107	-.223	.025	.118	.091	.129	-.086	-.062							

Notes: T-Test results: significant at the .1 level when scores are > 1.67 / at the .05 level: score > 2.01.
Correlations above and to the right of the diagonal are survivors; below and left are failures.

Table 2. LOGIT Analysis Results for Overall Model

	Estimate	(Std. Error)	Predictive Accuracy			
			For the Sample Employed	For the Hold Out Sample	Predicted	Predicted
Corporate Level Strategy						
Diversification	.272	(.776)				
Environments:Ind. Profit	-.016	(.035)	Predicted			
Ind. Growth	.001	(.241)	0	1	0	1
Business Level/Market Share Strategy						
Relative market share	.044*	(.026)	0	16	0	23
Firm size	.230	(.412)	77%	23%	67%	33%
			Actual	Actual		
Cooperative/Collective/Networking Strategy						
Board interlocks	.150*	(.077)	1	49	1	55
% outside directors	-.003	(.012)	21	70%	15	79%
Joint ventures	.195	(.435)	30%		21%	
Financial Strategy						
Equity / assets	.047****	(.011)	Average Accuracy = 73.6%		Average Accuracy = 72.9%	
Control Variable & Constant						
Age of corporation	-.003	(.008)	R ² = .315		R ² = .207	
Constant	-2.908	(1.183)	Chi ² = 31.274****		Chi ² = 29.644****	

Notes: * $p < .1$; ** $p < .05$; *** $p < .01$; **** $p < .001$.

Table 3. LOGIT Analysis Results for Annual Models

Estimates:	Years in Advance									
	One		Two		Three		Four		Five	
	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error	Estimate	Std. Error
Corp. Level Strategy										
Diversification	-.256	1.427	-.080	1.271	.103	1.334	1.163	1.477	1.614	1.402
Enviro.: Ind.Profit	-.044	.066	.041	.106	.036	.064	.024	.056	.049	.072
Ind.Growth	-.270	1.037	-.111	1.203	4.012	1.607	1.047	.918	-.366	.292
Business Level/Market Share Strategy										
Rel. market share	.029	.068	.052	.049	.020	.052	.058	.054	-.087	.057
Firm size	1.189	.877	.680	.902	2.697**	1.076	-1.136	1.018	-1.216	.777
Cooperative/Collective/Networking Strategy										
Board interlocks	-.005	.090	.016	.120	.106	.151	.285*	.165	.407**	.187
% outside directors	.004	.027	-.002	.031	-.006	.020	-.032	.024	.035	.021
Joint ventures	.253	.284	.890	.638	4.936	4.192	.043	.762	-.964	.710
Financial Strategy										
Equity/Assets	.077****	.026	.104****	.031	-.008	.019	.080****	.030	.091****	.034
Control & Constant										
Age of Corporation	-.013	.019	.005	.015	-.015	.017	.007	.020	.024	.021
Constant	4.502*	2.601	-6.771**	3.185	-6.402**	2.687	-1.850	2.715	-5.354**	2.321

Years in Advance

		Years in Advance				
		One	Two	Three	Four	Five
Predictive Accuracy:		Predicted	Predicted	Predicted	Predicted	Predicted
			0 1	0 1	0 1	0 1
	0	23 5 82% 18%	22 6 79% 21%	23 5 82% 18%	22 6 79% 21%	23 5 82% 18%
	1	3 25 11% 89%	3 25 11% 89%	8 20 29% 71%	7 21 25% 75%	6 22 21% 79%
	Actual					
	Average Accuracy =	75.7%	83.9%	76.8%	76.8%	80.4%
	R ² =	.501	.455	.370	.320	.416
	χ ² =	31.274****	26.274****	16.258****	16.092****	20.669****
	Jackknife Accuracy =	71.4%	69.6%	76.8%	66.1%	64.3%
	Jackknife Agreement =	85.7%	82.1%	96.4%	87.5%	83.9%

Notes: * p < .1; ** p < .05; *** p < .01; **** p < .001.

as the firm nears potential demise. (Given our understanding of the road to bankruptcy—e.g. see Argenti, 1976 or Hambrick & D'Aveni, 1988—one would assume this would be the case). For example, we are likely to find that net worth to assets is more important as a firm gets closer to potential failure. Thus, looking at each year should result, not only in uncovering alterations in these variables over time, but in an improved set of R-squares and higher predictive accuracies. As part of the next phase of this research, it is these changes to which we now turn our attention.

Table 3 shows the results from the LOGIT analysis performed for each sample year (summary statistics have not been included here for the sake of brevity but they are shown in Appendix 3). The results show that in almost all years equity to assets is the most important determinant as to whether a firm goes under or not. The exception to this is in sample year three, where sales size is the only significant attribute which differs between failed and surviving firms. In the two years farthest away from potential bankruptcy board interlocks is also a significant variable in the LOGIT analysis. The average predictive accuracy for all five models was approximately 79%. The Chi-squared statistic for all the models demonstrates that there was less than a .0001 chance that such a level of accuracy in the results could have occurred by chance. Though the jackknife procedure results demonstrated a lower level of predictive accuracy for each sample year, their accuracy was not significantly lower than what resulted in the use of all observations.

The results of the LOGIT analysis performed for each sample year show some indication that firms may alter strategies as they move toward potential demise (one would expect some attempt at a turn-around as the firm's condition declined). However, the evidence provided by the LOGIT models is weak and may simply be attributable to differences in the firm's employed in each sample (i.e. changes in the results between sample years may be due to changes in the samples rather than the passage of time). Thus, a final test was performed to see what changes occur in these failing firms that are not present in surviving ones.

The researcher was able to obtain multiple year data for a sub-sample of eighty firms—forty failed and forty surviving firms. Data on the forty failed firms was obtained for the periods one to two years prior to potential failure and four to five years prior to potential failure. Employing this particular 1\2 to 4\5 year split (1) allowed for a sufficient number of firms in the sub-sample and (2) allowed for at least two years to elapse for a change to occur in the firms. Firms were again matched by age and summary statistics were analyzed (summary statistics are not included here for the sake of brevity but are shown in Appendix 4).

As shown in Table 4, three LOGIT models were developed: one for the period one to two years prior to potential failure, a second one for the period four to five years prior to potential failure and a third one representing the percentage change between the two periods (see Appendix 2 for details). Table 4 shows the results from the LOGIT analysis performed on each of the three samples discussed above (again, summary statistics have not been included here

TABLE 4: LOGIT Analysis Results for the Change Model

Estimates:	<i>Years in Advance</i>								
	<i>One to Two</i>		<i>Four to Five</i>		<i>Change 4\5 - 1\2</i>				
	<i>Estimate</i>	<i>(Standard Error)</i>	<i>Estimate</i>	<i>(Standard Error)</i>	<i>Estimate</i>	<i>(Standard Error)</i>			
Corp. Level Strategy									
Diversification	-.265	(1.108)	.358	(.969)	-.469	(.529)			
Environment: Ind.Profit	1.166 *	(.847)	.718	(.953)	.100	(.204)			
Ind.									
Growth	-.024	(.077)	.041	(.053)	-.042	(.104)			
Business Level / Market									
Share Strategy									
Rel. market share	.062 *	(.039)	.019	(.036)	-1.768 **	(.813)			
Firm size	-.074	(.734)	-.179	(.630)	11.367 **	(4.700)			
Cooperative/Collective / Networking Strategy									
Board interlocks	.087	(.122)	.390 ***	(.136)	-1.126 ***	(.401)			
% outside directors	-.020	(.020)	-.064 ***	(.024)	1.374	(.971)			
Joint ventures	.578	(.673)	.951	(.658)	.054	(.103)			
Financial Strategy									
Equity / Assets	.081 ****	(.021)	.040 **	(.018)	.568 *	(.335)			
Control & Constant									
Age of Corporation	-.001	(.012)	.005	(.012)	1.668	(1.263)			
Constant	-2.560	(1.950)	-.430	(1.891)	.566	(.367)			
<i>Years in Advance</i>									
Predictive accuracy:	<i>One to Two</i>		<i>Four to Five</i>		<i>Change 4\5-1\2</i>				
	Predicted		Predicted		Predicted				
	0	1	0	1	0	1			
Actual	0	32 80%	8 20%	0	32 82%	8 18%	0	26 65%	14 35%
	1	8 20%	32 80%	1	11 27%	29 73%	1	9 22%	31 78%
Average Accuracy =	80.0%		76.3%		71.3%				
R2 =	.639		.560		.478				
Chi ² =	28.800 ****		22.175 ****		14.679 ****				
Jackknife Accuracy =	75.0%		66.3%		66.3				
Jackknife Agreement =	92.5%		90.%		95.0				

Notes: * p<.1; ** p<.05; *** p<.01; **** p<.001.

for the sake of brevity but are shown in Appendix 4; a list of the firms employed is included in Appendix 1).

The results in the first two columns of Table 4 shows that the models developed for the sample years 1\2 and sample years 4\5 have approximately

the same level of predictive accuracy as the previous annual models developed. The third column of Table 4 (what will be referred to in this paper as the *change model*) is the LOGIT model developed employing the changes in variables as the firms moved from the period 4\5 years prior to potential bankruptcy to the period 1\2 years prior to potential bankruptcy. Although the predictive accuracy of this model is somewhat less than the others, the model demonstrate some interesting results.

The first interesting observation regarding the change model was that there was a significant change in firm relative market share and size from the 4\5 year period to the 1\2 year period. However, changes in size were positively related to survival, while changes in relative market share were negatively related to survival. This latter finding would make the use of market share as a performance measure questionable since failing firms seem to be improving their market share “performance” when other indicators of performance logically show a decline. In the discussion section below some possible reasons are offered for why this might occur.

Another significant factor in the change model was the change in director interlocks from the 4\5 year period to the 1\2 year period. The change in interlocks was negatively related to the firm’s likelihood of survival. Failing firms gained significantly more interlocks than surviving firms. Possible reasons for this occurrence, again, are reviewed in the discussion section.

Finally, the financial resources of failing firms significantly declined from the 4\5 year period to the 1\2 year period. So the firms which failed not only tended to be financially weaker as far as five years in advance of their demise but they also tended to exhibit a rate of change significantly different enough to make these firms easily identifiable.

Results of the Hypothesis Tests

The results of the hypothesis tests are based on the variable’s significance in the LOGIT analyses. The results summarized in Table 5 indicate—in columns one, two and three, respectively—the results of the hypotheses based on: the overall LOGIT model, the annual LOGIT models, and the change model (assuming that as failing firms move toward bankruptcy the differences between these firms and surviving ones are exacerbated). The results from Table 5 show that relative market share, director interlocks, firm resources and to some extent firm size play an important role in differentiating surviving firms from failing firms. Some possible explanations for the results are discussed below.

Hypothesis 1: The LOGIT models provided almost no evidence, *ceteris paribus*, to support a relationship between survival and corporate level strategies involving diversification and industry selection. The only significant exception being a positive relationship between industry profitability and survival year 1\2 LOGIT model (see Table 4). A possible reason for this particular survival/profitability relationship is reviewed in the discussion section.

Hypothesis 2: There is a significant positive relationship between the firm’s relative market share and survival in the overall LOGIT model. As well, there was a positive relationship between change in size and survival. However,

TABLE 5: Summary of Results of Hypotheses 1 through 4

Hypothesis	Results		
	Full Model	Annual Models	Change Model
Corp. Level Strategy			
1a Corporate level diversification	Not supported	Not supported	Not supported
1b Environment: Industry Profit	Not supported	Not supported	Not supported
1c Industry Growth	Not supported	Not supported	Not supported
Business Level / Market Share Strategy			
2a Relative market share	Supported (+)	Not Supported	Supported (-)
2b Firm sales size	Not Supported	Not Supported	Supported (+)
Cooperative/Collective/ Networking Strategy			
3a Board interlocks	Supported (+)	Supported (+)	Supported (-)
3b Percentage of outside directors	Not Supported	Not Supported	Not Supported
3c Joint ventures	Not Supported	Not Supported	Not Supported
Financial Strategy			
4 Equity / Assets	Supported (+)	Supported (+)	Supported (+)

Note: (Supported = there is a significant relationship between the variable and survival.

firms also exhibited a significant negative relationship between survival and change in relative market share over time. How firms can shrink and gain market share is explained in more detail in the discussion section. (Though such a result may occur when firms gain sales in less concentrated industries while losing sales in more concentrated industries.)

Hypothesis 3: Regarding cooperative, collective or networking strategies a firm's director interlocks were a significant factor in the overall model, two of the annual models and the change model. In the overall model, and the two annual models where interlocks were significant contributors to the models there was a positive relationship between prior periods' director interlocks and future potential for survival. In theory, this means that through the manipulation of the firm's relationships with other firms the organization can better ensure its continued existence. The fact that the relationship between interlocks and survival seems to fade in the three years prior to failure and that there was a negative relationship between the change in interlocks from the 4\5 year period to the 1\2 year period might indicate that failing firms gain interlocks as they decline. There are several possible reasons for this and these are reviewed in the following discussion section.

The lack of significant results regarding a relationship between joint ventures and survival may be a reflection of the raw nature of the measure employed here. A simple count of the number of joint ventures does not take into account other factors which may impact, not only the success of the venture, but the firms involved. For example, the reasons why companies become involved in the venture may be a better reflection on their likelihood of

continued existence. For instance, firms may get involved in a joint venture because they lack the financial resources to make even slight inroads into a new market. This lack of financial resources, as we have seen, is hazardous for the continued existence of the firm and such firms are likely to go under. Such involvement on the part of a poor firm in a joint venture is a far cry from the firm which becomes involved in a joint venture because of the desire to co-opt potential competitors and so better organize the players in the market so that profits can be maintained at a higher level. Such a firm may thus be able control market forces to such an extent that its likelihood of failure is slim.

Hypothesis 4: With regard to the firm's financial strategy and survival, there was a significant positive relationship between financial resources and survival in the overall model, in four of five annual models and in the change model. Such results (with the exception of the Year 3 annual model) are consistent with the hypothesis that net worth to total assets is positively related to survival.

Discussion

There were three main patterns discernible from the results. The first observable pattern relates to business level or market share strategy; the second pattern relates to interorganizational cooperative, collective or networking strategies; the final pattern relates to financial strategies. The last of the three patterns had a relatively straightforward relationship with survival but the first two patterns had some quirks which need to be discussed. In order to better understand the connections between the observations made above, as well as to raise future research questions, some of the following arguments may contain some speculative elements. However, since the nature of the present research is exploratory such speculation is not unjustified.

Business level or market share strategy results lead to the question: how was it possible that the firm could shrink in size and grow in relative market share? We can speculate that if failing firms were withdrawing from, or being pushed out of, industries with high concentration ratios and moving into more fragmented industries (which may offer the firm a chance to find a comfortable niche), then their size would be reduced while their relative market share would increase. Additionally, since diversification was not a significant predictor it is likely that failed firms did not so much withdraw from certain industries as they reallocated (whether purposely or not) the percentage of sales in each industry. In other words, a higher percentage of failing firm's shrinking sales were derived from non-traditional and more fragmented markets. Such markets are likely to exhibit attributes that impact profitability and may make it harder for a firm to compete (Porter, 1980). This would explain why industry ROE is a positive significant predictor in the 1\2 year LOGIT model—i.e. failing firms have moved to less profitable, more fragmented industries. Such moves might also indicate a failed turnaround effort where the firm attempted to shift away from its dependence in its traditional markets but could not generate the sales volumes it intended in the markets to which it was moving.

Cooperative, collective or networking strategies results demonstrated that director interlocks were generally positively related to survival. However, change in interlocks from the 4 to 5 year period to the 1\2 year period (see Table 4) was negatively related to the firm's likelihood of survival. Thus, in terms of interlocks, failing firms began to look more like their surviving counterparts as they approached bankruptcy. From, what has been called an institutional perspective (Judge & Zeithaml, 1992), failing firms exhibit a degree of isomorphism. These firms are basically "attempting to conform to the accepted norms of their populations", (p. 769). By gaining interlocks the firm may gain a certain degree of legitimacy or even prestige (depending on who joins the board). This legitimacy or prestige may cause others in the environment to view the firm as more likely to survive and thus, in some way, to be more dependable. Such a perception can then be employed to entice resource providers (e.g. creditors) to continue to support the firm (D'Aveni, 1987; 1989a). The present study, however, shows that such attempts are generally unsuccessful.

A different possible reason for the change negative relationship between survival and change in interlocks may be that as the firm shrinks in size and possibly loses share in its traditional markets, others with which the firm may have a relationship (particularly creditors) are likely to demand a presence on the board. Alternately, failing firms might desire an increase in their director interlocks in order to co-opt resource providers. Yet, why are interlocks positively related to survival but an increase in interlocks negatively related to survival? It may be simply what the interlocks represent for different types of firms. For healthy firms interlocks may be a source of valuable advice and information which managers can employ to keep the firm healthy (Caldwell, 1985). For failing firms new interlocks may represent a threat that investors are worried about the firm and may take a more active role in the decision making process. Such a threat could exacerbate managerial paralysis or rigidity and possibly hasten the demise of the company (Staw et al, 1981).

Alternately, new interlocks may provide a way for managers of failing firms to delude themselves into believing that their present course of action is proper (Hambrick & D'Aveni, 1988). If one were to be less cynical there is a possibility that the change in interlocks over time might be a result of people on the board joining additional boards in an effort to find ways to improve the firm's situation. However, changes in the firm's market share and size indicate that the strategic decisions are made at the same time the interlocks are being established—thus indicating a search for confirmation that decisions already made were the right ones.

Financial strategy findings showed that in almost all cases the firms which failed were financially weaker than the survivors. Thus, as far as five years prior to failure there is significant evidence that these firms are likely to fail. As has been noted above (and by D'Aveni, 1987; 1989a) there are reasons why, in spite of the firm's poor financial condition, its resource suppliers would continue in their relationship with the firm.

Questions regarding no significant results also arise here. The above results are interesting but, equally so is what the models did not uncover. Corporate

level strategy had no significant impact on the likelihood of survival. Neither industry selection nor diversification were important variables in any of the models. There are two likely reasons for this lack of results. One possible reason is that other variables are more important than industry conditions—i.e. one could make the strategic choice perspective argument (D'Aveni, 1987) that good management wins out over poor industry conditions. Thus in many cases firms may be able to survive even in poor industry environments. Also possible is the institutional perspective argument that some organizations are able to resist conforming to external pressures because of unique conditions surrounding the firm's founding and history (Judge & Zeithaml, 1992). That is, poor performing firms may have institutionalized behaviors that make it more likely for them to fail even though they might exist in profitable and/or growing industries. Argenti (1976) discusses a number of these behaviors—e.g. an autocratic C.E.O., poor distribution of financial skills and a resistance to change that make it more likely that the firm will make a mistake that will bring about its downfall. Finally, if industry differences do not effect the likelihood of survival, then the use of diversification to minimize the impact of industry conditions would also make little difference.

An integration of the disparate results of the present study might be in order here. If the results presented here tell us a story, it would go something as follows. A failing firm is weaker in both financial and managerial resources. These results tend to confirm the conclusion's reached by D'Aveni (1989b). In other words, the firm is undertaking a high risk financial strategy—equity to assets show the firm is highly leveraged. Additionally, its interorganizational network is weak—there are insufficient interlocks and there may be sufficient numbers of outsiders on the board who are not working in the company's best interest (note the significantly negative relationship between outsiders and survival in the year 4\5 LOGIT analysis).

Because there is a lack of managerial talent on the board growth expectations may be overly optimistic. This is in agreement with the conclusions reached by Argenti (1976) and Keasey & Watson (1987). Several years prior to failure market growth may become lower than expected (e.g. see year 4 market growth). Having few resources the firm will attempt to contract and re-deploy resources into markets where success seems more likely (hence the LOGIT analysis' significant positive relationship between size change and survival and negative relationship between relative market share change and survival). Because the firm lacks managerial resources the decision to make strategic re-deployments was likely developed without any real discussion as to the advantages and disadvantages of possible new strategies to the firm. While re-deployment is occurring, director interlocks are increased in an effort to find support for decisions already made (again, this confirms points made about managerial self delusion by Hambrick & D'Aveni, 1988 and D'Aveni, 1989b). At this point the firm may encounter an external shock like a decline in industry profits sufficient to bring the firm to its knees (e.g. see year 1\2 of the LOGIT analysis results for the change model). This result tends to confirm Hambrick & D'Aveni's (1988) conclusions regarding the end game for the firm.

Conclusions, Limitations and Implications

The research has developed a model which addresses some of the issues regarding the relationship between strategy and organizational death. Many of the strategic variables studied here showed a relationship to corporate survival. What conclusions can be drawn from this research? How does the present study contribute to our knowledge of organizational death? There are four main contributions of this study.

First, and most obviously, the financial resources of failed firms were weaker than their surviving counterparts for a long period of time (up to five years) prior to actual bankruptcy. The maintenance of a high degree of equity (relative to assets) may serve as slack, or a buffer against potential bankruptcy (Hambrick & D'Aveni, 1988). If we wish to keep corporations from involving themselves in the disruptions which can occur with a bankruptcy, such a buffer is necessary. Thus, the argument most notably set forth by Jensen (1989) that high leverage serves as a method to force managers to better employ resources seems questionable when one considers the difficulties which arise should the firm enter a bankruptcy proceeding. However, a complete discussion regarding this argument is beyond the scope of the present study.

Second, the research here shows that though market share is important in the fight for survival, setting market share increase as a goal (as suggested by Stonich, 1981) is questionable, and obtaining it can result in a pyrrhic victory (Fruhan, 1982). Changes in business level or market share strategy may be poorly formulated or executed by failing firms. Such moves may only serve to quicken the firm's demise. A well thought out niche strategy (Porter, 1980) is preferable for the financially weak firm. However, such a strategy is unlikely to be undertaken by the failing firm since these firms lack the managerial expertise on the board to advise adequately in the formulation of strategy.

Third, failed firms could be distinguished from survivors by their cooperative, collective or networking strategies—particularly director interlocks. However, acquisition of such interlocks as the firm goes downhill is more a cause for alarm than celebration since such interlocks do little to save weak firms after they have slid close to bankruptcy. What we see in the present study tends to confirm what Hambrick & D'Aveni (1988) concluded regarding the downward spiral of failing firms. However, what we have seen here is that a firm's strategic extremism may be more intense and more ubiquitous over a wider size range of firms than what Hambrick & D'Aveni suggest. The sample used here included firms which were both equal to and smaller in size than those that Hambrick & D'Aveni studied. The smaller firms were more likely to succumb to autocratic behavior by top management as suggested by Argenti (1976). That is, decision making authority may become concentrated and this may lead to mistakes that lead to failure (this process was also noted by D'Aveni, 1989b).

Finally, a great amount of organizational inertia (Hannan & Freeman, 1984) exists in the failing organization. The inertia seems, however, to be more psychological than institutional. That is, the organization's management is

bound to its course of action more due to its perceived commitment to the strategy it is undertaking rather than stakeholders restraining its behavior. The fact that failing organizations are able to make changes which effect their size and market share shows that they have some degree of strategic choice (see D'Aveni, 1987 for a discussion of this as it applies to organizational failure). In other words managers can, to some degree, impose their decisions upon stakeholders. However, it appears that they have a hard time adjusting the course they have set for the firm when the new direction may begin to have problems. When the company begins to have problems in the course of re-deployment, not only does centralization and rigidity increase (Staw, Sandelands & Dutton, 1981) but decision makers likely seek psychological reinforcement (via increased interlocks) to affirm that they are on the right course. Thus, instead of providing a source for potential alternative strategies, interlocks are simply employed to shut off such information (Smart & Vertinsky, 1977) and reinforce decisions already made (D'Aveni, 1989b).

While the present exploratory study investigates a number of relationships between strategy and failure there are limits to the conclusions which can be reached. As has been discussed, explanations other than strategic choice on the part of the firm's management may account for some of the results. However, since additional managerial characteristics were found important in the D'Aveni studies, the model presented here may simply not reflect the full range of managerial variables possible. Thus, managerial attributes may contribute more to the survivability of the firm than the present study can give them credit. There are additional limits to what can be done with the data available. First, the study is not generalizable to firms which are very young, very small or greatly impacted by regulation or changes in regulation. Second, since this study consisted mostly of cross-sectional data with only slight use of limited time series data, some conclusions regarding how a corporation dies are more suggestive than definitive. However speculative such conclusions may seem they do force us to look into some possibly interesting directions.

Several potentially fruitful lines of research are suggested from this study. First, since the measures of industry environment were very basic (simply profitability and growth), future research in this area could include a more well developed set of environmental measures, e.g. Dess & Beard's (1984) dimensions of task environments. Such a wider set of variables may demonstrate a more significant relationship between survival and positive industry conditions. Additionally, a more in-depth investigation into the firm's historical industry conditions may reveal a great deal more than the present limited exploration. Second, in an attempt to better ensure their survival, to what extent do firms which try to move away from certain organizational environments and into others; when, and under what conditions is it best attempt such a maneuver; and what role does the board play in this determination? The answers to such questions may tell us much about how firms adapt to their environment and the role that the board might play in such adaptation. Third, the finding that survival and board interlocks are related obviously calls for continued investigation into what other factors of board structure and make-up contribute

to the survival of the firm. Future studies could address the extent to which surviving and failing firms differ regarding committee assignments and structure, as well as the managerial backgrounds of board members. With such investigations we may be able to gain insights, not only into how firms fail, but more importantly what actions they should take to better allow them to survive.

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(Appendices follow)

Appendix 1: Corporations in the Samples

	Year 1		Year 2		Year 3		Year 4		Year 5	
Failures	Survivors	Failures	Survivors	Failures	Survivors	Failures	Survivors	Failures	Survivors	
CORPORATIONS IN THE OVERALL AND ANNUAL SAMPLES										
Lawhon, John.	Rollins Envir.	Pizza Time	Health-Chem	S.A.L. Cable	Health Info.	Great Outdoor	Visual Technl.	Gilman Serv.	Home Depot	
Geophysic.Sys.	Minn. Fabrics	K-Tel Intl.	Optical Coat.	Altec Elect.	Oil Dri	Oxoco	Liebert	Storage Tech	General Bind.	
Itel	Pier 1 Imports	Shelfer Rescr.	Grand Auto	Texscan	Kasler	Advent	Parker Dril.	Natl. Paragon	Bristol	
Sambos Rest.	Claire's Stores	Tomlinson Oil	Polyplastex	Keydata	Brunos	Winn Enterprs.	Standun	Argo Petrol.	Natl. Spinning	
Gateway	Medex	CS Group	Wellco Enterp.	Glover	Kay	Victoria Stat.	Newcor	Amer. Monitor	Autotrol	
Flame	Rohr Ind.	Nicklos Oil	King Kullen	Schaak Elect.	Allied Farm	Imperial	Sykes Data.	Connor	Hungry Tiger	
Lynnwear	Seligman/Latz	Wickes	Central Soya	Spiral Metal	Texas Ind.	Napac Inc	Stuart Hall	Pubco	Sanders Assoc.	
Dalco Petrol.	Rollins Inc.	Rusco	King Kullen	Allied Tech.	Mitchel Eng.	Edmos	G & K Service	Mr. Steak	Amer. Bilrite	
Leisure Dyn.	Pepsico	Transcon.Eng.	Pittston	Opelika	Tenneco	General Explr.	Rockaway	Dant-Russel	Donneley (RR)	
Tobin Packing	Haverty Furn.	Manville	Axia	Natl. Shoes	Sheller Globe	Spencer Co.s	Merck	Nexus	Niagra Front.	
Reading Ind.	Allied Stores	AM Internatl.	Technical Tape	Lafayette Rad.	West Co.	Crystal Oil	Rohm & Haas	Kaiser Steel	Northrop	
McLouth Steel	Comm. Shear.	Heywood Wake.	Standrd.Regst.	Contintl.Steel	Genesco	Monolith Cemt.	Gulf Oil	Revere Copper	United Tech.	
N.West.Engnr.	Fleming	Henry Gilpin	Lightolier	Righton Intl.	George Banta	H & H Baking	Ero Ind.	Amfesco	Hill Bros.	
Mesta Machine	Ohio Mattress	Crompton	Russell	Upson	National Can	Macrodyn	U.S. Gypsum	Wheeling Pitt.	Hajoca	
Magnuson Comp.	Beeline	Consol.Petro.	Unocal	Travel Equip.	Wendys Intl.	Steiger Tract.	Interntl.Game	Mego Interntl.	Aerona	
Stevco/knits	La Quinta	MGF Oil	Suave Shoe	Magic Marker	Amer. Micro.	Eastmet	Diagnostic Pro	Newberry Eng.	United Ind.	
Meridian	Liberty Homes	A I C Photo	Caressa	Roblin	Marion Labs.	Data Access	Atwood Oceanic	Flanigan's	Keithly Instr.	
Barclay	Nichols (SE)	Nucorp Energy	Tab Products	Commodore	Western Co.	Mobile Home	Sysco	Hecks	Litton	
Hardwicke	Southern Film	KDT Industries	Jacobs Engrng.	B.Brody Seat.	S.West Factory	Beehive Intl.	J L G	Robins (AH)	Millipore	
Maxon Inds.	Midland Glass	ATI	Donaldson	Garland	Country Miss	Global Marine	Resorts Intl.	HRT	Realex	
Marion Corp.	Clabir Corp.	Standrd.Metal	Outbrd. Marine	Berven Carpets	Grainger (WW)	Berry	Synalloy	Michigan Gen.	Swedlow Inc	
Steelemet	Steege	Koss	Interpublic	New Eng. Fish	Hazeltine	Seiscom Delta	Philips Ind.	Maemillian R.	Economics Labs	
Richmond Tank	Clark Consol.	Bobbie Brooks	Nielson (AC)	Evans Products	Pep Boys	Charter	Banner	Texaco	Goodrich (BF)	
Robintech	Getty Oil	Cook United	Barber-Green	Salant	Eastern Co.	U.N.A. Corp.	Milton Roy	Morton Shoe	Mine Safety	
Goldblat Bros.	Phillip Morris	Mays (JW)	Union Camp	Sam Solomon	Oscar Mayer	Crutcher res.	Leslie Fay	Continental G.	Curtis Publ.	
First Hartford	Publicker	Saxon	Fuller (HB)	Whippany Paper	Milton Bradley	LTV	Glenmore Dist.	Consol. Pack	Victory Market	
Robert/Porter	Cities Service	U.N.R. Ind.	Badger Meter	Tacoma Boat	Mark Controls	Smith Intl.	Tenney Engrng.	Todd Shipyard	Harsco	
Rath Packing	Lamson/Sesns.	Lionel	Interlake			Petitbone	Martin Proces.	Allis-Chalmer		

Note: The first fourteen firms in each of the above ten columns were employed in the overall sample; the remaining firms were used in the holdout sample.

Appendix 2: Calculations

CORPORATE LEVEL STRATEGY

Diversification	FDIV	=	$1 - \sum((FIS_a / TFS_{a-n}))^2$
Environments:			
Industry profit	IROE	=	$\sum (ROE_a (FIS_a / TFS_{a-n})) - 3 \text{ month T-Bill Rate}$
Industry growth	IGRO	=	$\sum (ISGR_a (FIS_a / TFS_{a-n}))$
	Where FDIV	=	Firm's Degree of Diversification;
	IROE	=	Ind. profitability of firm using industry ROE;
	IGRO	=	Industry growth rate for the firm;
	ISGR _a	=	$(IVOS_0 - IVOS_5) / IVOS_5$ and: where $IVOS_0$ = Ind. value of shipments in period (82\$s); $IVOS_5$ = Ind. value of shipments 5 yrs. prior (82\$s);
	ROE _a	=	Ind. avg. Return on Equity in 4-digit SIC ind. a;
	FIS _a	=	Firm sales in four digit SIC industry a;
	TFS _{a-n}	=	Total firm sales in all industries a through n);

BUSINESS LEVEL / MARKET SHARE STRATEGY

Market share	FRMS	=	$\sum ((FMS_a / FFCR_a) (FIS_a / TFS_{a-n}))$
Firm size	FSZS	=	Size of firm measured by log of sales in millions where Sales = Firm's inflation adjusted gross revenues;
	Where FRMS	=	Firm relative market share;
	FMS _a	=	Firm's market share in the 4-digit SIC ind. a;
	FFCR _a	=	Four firm concentration ratio; 4-digit SIC ind. a;
	FIS _a	=	Firm sales in four digit SIC industry a;
	TFS _{a-n}	=	Total firm sales in all industries a through n);

COOPERATIVE / COLLECTIVE / NETWORKING STRATEGY

Board interlocks	FDIL	=	Number of directorships held in other firms by board members of firm under study, divided by log of sales;
% of outside dir.s	FPOD	=	$(\text{Outside directors} / \text{total directors}) \times 100$;
Joint ventures	FJVS	=	Number of current joint ventures;

FINANCIAL STRATEGY

Equity / Assets	FEOA	=	Firm's total equity over total assets.
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CHANGE FROM 4\5-1\2 YRS.

Change in board interlocks	=	$(\text{Direct interlocks } 4/5 \text{ yrs. prior to potential failure} - \text{direct interlocks } 1/2 \text{ yrs. prior to potential failure}) / \text{direct interlocks } 4/5 \text{ yrs. prior to potential failure};$
Change for all other variables	=	$(\text{Results from period } 4/5 \text{ yrs. prior to potential failure} - \text{results from period } 1/2 \text{ yrs. prior to potential failure}) / \text{results from period } 4/5 \text{ yrs. prior to potential failure}.$

Appendix 3: Yearly Summary Statistics

	Correlations (.01 Sig. > .437)														
	Survivors					Failures									
	Mean	S.D.	Mean	S.D.	T-Test	1	2	3	4	5	6	7	8	9	10
Yr. = 1 N = 56															
1 Divers.	0.41	0.32	0.38	0.26	0.47		.109	.259	.175	.460	.075	.162	-.230	.103	.511
2 Ind. ROE	4.73	5.27	6.47	5.45	-1.21	.115		-.157	-.136	-.190	-.230	.215	-.113	-.030	-.169
3 Ind. Growth	0.20	0.37	0.09	0.46	1.04	-.111	.330		-.109	.325	.429	.247	.053	.055	.319
4 Mkt. Share	9.53	9.12	4.00	5.85	2.70	-.081	.166	.061		.558	.077	-.095	-.156	.139	.288
5 Sales Size	2.42	0.85	1.90	0.54	2.73	-.058	-.335	.094	.567		.175	-.080	-.174	-.022	.592
6 Interlocks	5.25	4.79	3.32	3.99	1.63	.013	.157	.076	-.008	-.106		.202	-.131	.267	.335
7 Outsiders	55.94	19.59	60.90	19.33	-0.95	.175	.337	.305	.241	-.004	.269		.154	-.139	.186
8 Joint Vent.	0.43	2.08	0.18	0.61	0.61	.241	.024	-.105	-.030	.013	-.019	-.068		-.218	-.246
9 Equity/A.	43.75	19.32	10.79	25.34	5.47	.110	.152	.053	-.043	-.025	.160	-.156	-.017		.115
10 Firm Age	35.18	24.40	32.71	24.08	0.38	.145	-.196	-.270	-.066	.243	.027	.083	-.137	-.001	
Yr. = 2 N = 56															
1 Divers.	0.45	0.33	0.44	0.30	0.09		-.331	.199	-.331	.386	.105	.140	.150	-.011	.185
2 Ind. ROE	6.41	3.69	6.53	4.86	-0.11	-.103		-.223	.481	-.341	-.076	.109	.264	-.211	-.101
3 Ind. Growth	0.24	0.42	0.25	0.42	-0.13	.034	.328		-.164	.407	-.114	-.081	.472	.097	-.026
4 Mkt. Share	9.70	10.47	6.12	8.16	1.42	.378	-.245	-.097		.267	.013	.163	-.016	-.393	.075
5 Sales Size	2.39	0.66	2.18	0.63	1.24	.472	-.432	.008	.585		.283	.170	.098	-.191	.406
6 Interlocks	4.86	4.23	3.83	2.84	1.07	.535	-.185	-.053	.168	.511		.544	-.143	.039	.341
7 Outsiders	59.64	15.86	63.30	15.87	-0.86	.191	.067	.186	-.159	.030	.243		-.438	-.104	.269
8 Joint Vent.	0.29	0.85	0.14	0.76	0.66	.018	.009	.410	-.131	-.064	-.124	-.041		-.123	-.201
9 Equity/A.	50.23	11.55	28.98	20.97	4.70	-.165	-.135	-.296	-.003	-.221	-.015	-.212	-.015	-.209	.151
10 Firm Age	50.32	20.42	41.79	37.01	1.07	.098	-.292	-.372	.032	.100	.246	.315	-.089	.023	
Yr. = 3 N = 56															
1 Divers.	0.44	0.34	0.39	0.30	0.60		-.333	-.242	-.340	.310	.456	.212	.391	-.414	.399
2 Ind. ROE	9.17	7.02	11.37	6.37	-1.23	.018		.262	.164	-.336	-.414	-.287	-.138	.217	-.256
3 Ind. Growth	0.25	0.33	0.10	0.30	1.79	-.143	.103	.025	.146	-.376	-.251	-.088	-.232	-.141	-.365
4 Mkt. Share	11.23	12.86	5.25	4.74	2.31	-.185	.103	-.108		.346	.021	.165	.126	.051	-.012
5 Sales Size	2.48	0.66	1.99	0.44	3.32	.144	-.354	-.243	.434		.495	.450	.499	-.036	.475
6 Interlocks	3.86	3.32	2.63	2.71	1.51	.368	.173	-.116	-.141	.080	.080	.332	.193	.003	.629

(continued)

Appendix 3 (Continued)

	Survivors		Failures		S.D.	T-Test	Correlations (.01 Sig. > .437)									
	Mean	S.D.	Mean	S.D.			1	2	3	4	5	6	7	8	9	10
Yr. = 3	N = 56 (cont'd)															
7 Outsiders	56.98	16.33	54.00	21.85	0.58	-0.25	.278	-.122	.003	-.195	.456	.314	-.402	.246		
8 Joint Vent.	0.36	1.10	0.00	0.00	0.00	.000	.000	.000	.000	.000	.000	.000	-.037	.127		
9 Equity/A.	41.37	20.72	37.32	21.52	0.72	-.154	-.011	.377	.203	.227	-.079	.000	.000	-.123		
10 Firm Age	43.18	26.22	40.07	24.00	0.46	-.006	-.192	-.152	.145	.423	-.081	.000	.058			
Yr. = 4	N = 56															
1 Divers.	0.45	0.34	0.37	0.30	0.96		-.123	.080	-.022	.492	.500	.307	-.084	.306		
2 Ind.ROE	8.95	6.73	8.45	5.75	0.30	.121		-.151	-.290	-.185	.020	.144	-.296	.067		
3 Ind.Growth	0.35	0.55	0.07	0.48	2.02	.280	.260		-.128	-.072	.058	.109	.096	-.270		
4 Mkt.Share	7.60	8.53	5.68	7.46	0.90	.181	.237	.178		.486	-.066	-.120	-.045	.312		
5 Sales Size	2.09	0.66	2.03	0.59	0.37	.544	.065	.181	.232		.487	.304	-.035	.329		
6 Interlocks	5.25	4.37	2.85	2.42	2.54	.300	.293	-.109	-.169	.517	.476	.021	.140	.298		
7 Outsiders	54.67	17.25	59.98	17.36	-1.15	-.035	.022	.155	.072	.137	.196	.202	.066	.273		
8 Joint Vent.	0.14	0.59	0.25	0.65	-0.65	.076	-.305	.087	-.029	.462	.207	.153	.028	.376		
9 Equity/A.	52.48	14.87	34.03	14.32	4.73	-.145	.107	-.095	-.026	-.089	-.167	-.148	.028	.376		
10 Firm Age	30.82	22.65	28.43	21.28	0.41	.230	.072	.071	-.141	-.003	-.394	-.175	-.337	-.006		
Yr. = 5	N = 56															
1 Divers.	0.49	0.33	0.37	0.29	1.43		-.073	-.129	.361	.629	.121	.284	-.070	-.009		
2 Ind.ROE	7.36	5.75	6.79	4.61	0.41	.007		.327	-.114	-.171	-.054	.022	-.158	.015		
3 Ind.Growth	-0.57	3.06	0.13	0.33	-1.21	-.017	.252		.017	.117	.135	.074	.040	.276		
4 Mkt.Share	7.70	8.62	6.99	8.47	0.31	-.067	.029	-.148		.637	.289	.227	.142	-.021		
5 Sales Size	2.42	0.80	2.29	0.64	0.67	.429	.019	-.003	.209		.600	.545	-.072	.229		
6 Interlocks	6.08	4.15	3.18	3.09	2.96	.326	.008	-.296	.113	.503	.518	.464	.040	.335		
7 Outsiders	58.81	13.50	49.68	23.97	1.75	.008	.036	-.281	.194	.147	-.088	.200	-.137	.317		
8 Joint Vent.	0.18	0.67	0.18	0.77	0.00	.263	-.295	-.376	.013	.260	.690	.352	-.060	.340		
9 Equity/A.	45.36	18.15	32.30	14.60	2.97	.052	-.127	.028	.289	.298	-.191	.107	-.060	.340		
10 Firm Age	37.61	22.94	34.46	21.24	0.53	.429	-.247	-.231	.300	.493	-.004	.415	.102	-.448		

Notes: T-Test results: significant at the .1 level when scores are > 1.67 / at the .05 level: score > 2.01.
 Correlations above and to the right of the diagonal are survivors; below and left are failures.

Appendix 4: Change Summary Statistics

	Survivors		Failures		T-Test	I	2	3	4	5	6	7	8	9	10
	Mean	S.D.	Mean	S.D.											
Yr. = 1 \ 2 N = 80															
1 Divers.	0.47	0.33	0.39	0.30	1.10										
2 Ind.ROE	5.42	3.63	5.26	5.04	0.17	.172									
3 Ind.Growth	0.28	0.52	0.09	0.31	1.95	.183	.228								
4 Mkt.Share	10.05	11.59	6.16	7.99	1.75	.333	-.101	.159							
5 Sales Size	2.38	0.65	2.17	0.62	1.48	.406	-.329	.217	.529						
6 Interlocks	5.29	4.55	3.42	2.50	2.28	.213	.007	.248	.155	.366					
7 Outsiders	59.11	16.69	58.90	19.76	0.05	.113	.193	.484	.063	.084	.336				
8 Joint Vent.	0.55	1.92	0.03	0.16	1.72	.187	.071	.226	-.015	.376	-.024	.064			
9 Equity/A.	48.27	17.08	23.06	20.83	5.92	.030	.078	.038	-.073	.018	.191	.018	.079		
10 Firm Age	39.73	21.51	39.88	32.43	-0.02	.103	-.165	-.170	-.047	.145	.172	.210	-.084		
Yr. = 4 \ 5 N = 80															
1 Divers.	0.45	0.34	0.38	0.31	0.97										
2 Ind.ROE	11.03	6.58	9.76	5.08	0.97	.324									
3 Ind.Growth	0.22	0.32	0.17	0.38	0.60	.229	-.018								
4 Mkt.Share	10.31	9.63	7.76	10.32	1.14	.298	.329	.130							
5 Sales Size	2.46	0.67	2.29	0.57	1.21	.440	-.041	.204	.384						
6 Interlocks	5.42	4.76	2.50	2.38	3.47	.189	.077	.062	.076	.338					
7 Outsiders	54.07	15.15	56.31	20.76	-0.55	.116	-.059	.362	.284	.398	.531				
8 Joint Vent.	0.45	1.57	0.10	0.38	1.37	.152	-.259	.550	.003	.352	.082	.265			
9 Equity/A.	49.16	16.98	37.91	18.62	2.82	-.151	-.138	.072	.113	.047	.124	.085	-.117		
10 Firm Age	37.05	21.52	37.23	32.42	-0.03	.023	-.224	-.033	-.044	.192	.324	.448	-.046	-.053	
Change: 4 \ 5 - 1 \ 2 N = 80															
1 Divers.	0.05	0.30	0.32	1.37	-1.24		.041	-.018	-.219	-.119	-.034	-.121	-.007	-.168	.039
2 Ind.ROE	-0.30	1.12	-0.20	1.50	-0.35	.136		-.106	-.044	.001	-.090	-.045	.300	.214	-.129
3 Ind.Growth	0.18	2.92	-0.28	2.81	0.71	-.262	-.057		.507	.533	-.006	-.025	-.102	.068	.009
4 Mkt.Share	-0.04	0.45	0.17	1.01	-1.20	.350	-.095	-.154	.839	-.154		.225	.090	-.059	-.151
5 Sales Size	-0.03	0.13	-0.06	0.09	1.49	.185	-.403	.035	.343	-.038	-.038	.173	-.039	-.080	-.179
6 Interlocks	0.10	0.69	0.64	1.24	-2.38	-.167	.024	-.017	-.127	.034		.290	-.044	.064	.291
7 Outsiders	0.13	0.30	0.10	0.34	0.37	.014	.061	-.036	.201	-.134	-.054		-.087	-.049	.092
8 Joint Vent.	-0.04	0.23	-0.06	0.23	0.51	.068	-.198	.033	.178	.198	.133	.003		.023	.289
9 Equity/A.	-0.04	0.21	-0.02	1.42	-0.11	.256	-.017	-.050	.227	-.006	.213	-.220	-.019		.165
10 Firm Age	0.24	0.65	0.12	0.09	1.22	-.219	-.117	.154	.132	.024	.174	.021	.171	-.097	

Notes: T-Test results: significant at the .1 level when scores are > 1.67 / at the .05 level: score > 2.01.
Correlations above and to the right of the diagonal are survivors; below and left are failures.

Notes

- 1 All of Scott's (1987) numerous definitions treat organizations as "systems" in which humans interact. Such interactions will be impacted by stakeholder groups or "coalitions" (Cyert & March, 1963; Pfeffer & Salancik, 1978; Scott, 1987). These coalitions have goals for the organization (Etzioni, 1964; Scott, 1987), including the survival of the system (Sills, 1957; Amihud & Lev, 1981; Donaldson & Lorsch, 1983). However, survival is problematic as the organization must depend on the environment to obtain resources (Pfeffer & Salancik, 1978; Delacroix & Carroll, 1983).

References

- Altman, Edward I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy, *Journal of Finance*, 23(4): 589-609.
- Altman, Edward I., Haldman, Robert G. & Narayan, P. (1977). Zeta analysis, a new model to identify bankruptcy risk of corporations, *Journal of Banking & Finance*, (1) 1: 29-54.
- Amihud, Yakov & Lev, Baruch. (1981). Risk reduction as a managerial motive for conglomerate mergers, *Bell Journal of Economics*, Autumn: 605-617.
- Argenti, John. (1976). *Corporate collapse: The causes & symptoms*, New York: John-Wiley.
- Astley, W. Graham. (1984). Toward an appreciation of collective strategy, *Academy of Management Review*, 9 (4): 526-535.
- Astley, W. Graham & Fombrun, C. J. (1983). Collective strategy: Social ecology of organizational environments, *Academy of Management Review*, 8 (3): 576-587.
- Aziz, Abdul, Emanuel, David C. & Lawson, Gerald H. (1988). Bankruptcy prediction - an investigation of cash flow based models, *Journal of Management Studies*, 25 (5): 419-437.
- Bain Joe S. (1951). Relation to Profit Rate to Industry Concentration: American Manufacturing, 1936-1940, *Quarterly Journal of Economics*, 65 (August): 293-324.
- Bass, Frank M., Cattin, Phillippe & Wittink, Dick R. (1978). Firm effects and industry effects in the analysis of market structure and profitability, *Journal of Marketing Research*, XV, February: 3-10.
- Beaver, William (1967). Financial ratios as predictors of failure, empirical research in accounting, *Selected Studies*, Supplement to the *Journal of Accounting Research*: 71-111.
- Betton, S. (1990). Bankruptcy prediction: A proportional hazard approach, *Administrative Sciences Association of Canada: Finance Division Proceedings*: 22-29.
- Black, Bernard S. (1989). Bidder overpayment in takeovers, *Stanford Law Review*, 41 (2): 597-659.
- Boston Consulting Group (1972). *Perspectives on Experience*, Boston: Boston Consulting Group.
- Bourgeois, L. J., III (1981). On the measurement of organizational slack, *Academy of Management Review*, 6 (1): 29-39.
- Bradley, Michael & Rosenzweig, Michael. (1992). The untenable case for chapter 11, *Yale Law Journal*, 101 (5): 1043-1095.
- Bresser, Rudi K. F. (1988). Matching collective and competitive strategies, *Strategic Management Journal*, 9 (4): 375-385.
- Burt, Ronald S. (1983). *Corporate Profits and Cooptation*, New York: Academic Press.
- Buzzell, Robert D., Gale, Bradley T. & Sultan, Ralph G. M. (1975). Market share: A key to profitability, *Harvard Business Review*, 53(1): 97-106.
- Caldwell, Donald R. (1985). Generally Accepted Rules and Key Functions of the Board, Pp. 10.1-10.5 in Edward Paul Mattar, III and Michael Ball (eds.), *Handbook for corporate directors*, New York: McGraw-Hill,
- Cameron, Kim S., Sutton, Robert I. & Whetten, David A. (1988). Issues in organizational decline, Pp. 3-19 in Kim S. Cameron, Robert I. Sutton & David A. Whetten (eds.), *Readings in organizational decline, frameworks, research, and prescriptions*, Cambridge, MA: Ballinger Publishing.
- Carroll, Glenn R. & Delacroix, Jacques. (1982). Organizational mortality in the newspaper industries of Argentina and Ireland: An ecological approach, *Administrative Science Quarterly*, 27: 169-198.
- Chen K. U. & Shimerda, T. A. (1981). An empirical analysis of useful ratios, *Financial Management*, 10 (Spring): 51-60.
- Child, John. (1972). Organizational structure, environment and performance: The role of strategic choice, *Sociology*, 6(1): 2-22.
- Christensen, H. Kurt & Montgomery, Cynthia. (1981). Corporate economic performance: Diversified strategy versus market strategy, *Strategic Management Journal*, Oct.: 327-43.
- Chudson, Walter A. (1945). *The pattern of corporate financial structure*, New York: National Bureau of Economic Research.
- Cox, D. R. (1970). *The analysis of binary data*, London: Methuen.

- Crask, Melvin R. & Perreault, William D. Jr. (1977). Validation of discriminant analysis in marketing research, *Journal of Marketing Research*, 14 (February): 60-68.
- Cyert, Richard & March, James G. (1963). *A behavioral theory of the firm*, Englewood Cliffs, NJ: Prentice-Hall.
- D'Aveni, Richard A. (1987). *Organizational deterioration, decline, and death: The role of corporate conflict*, Unpublished Doctoral Dissertation, Columbia University.
- _____ (1989a). Dependability and organizational bankruptcy: An application of agency and prospect theory, *Management Science*, 35 (9): 1120-1138.
- _____ (1989b). The aftermath of organizational decline: A longitudinal study of the strategic and managerial characteristics of declining firms, *Academy of Management Journal*, 32 (3): 577-605.
- Davis, Rachel & Duhaime, Irene M. (1992). Diversification, vertical integration, and industry analysis: New perspectives and measurement, *Strategic Management Journal*, 13 (7): 511-524.
- Delacroix, Jacques & Carroll, Glenn R. (1983). Organizational foundings: An ecological study of the newspaper industries of Argentina and Ireland, *Administrative Science Quarterly*, 28: 274-291.
- Dess, Gregory G. (1980). The relationship between objective and subjective measures of manufactures' competitive environments: Implications for firm economic performance, Unpublished Doctoral Dissertation, University of Washington.
- Dess, Gregory G. & Beard, Donald W. (1984). Dimensions of organizational task environments, *Administrative Science Quarterly*, 29: 52-73.
- Donaldson, Gordon & Lorsch, Jay W. (1983). *Decision making at the top*, New York: Basic Books.
- Dornbush, Rudiger & Fisher, Stanley. (1984). *Macroeconomics*, 3rd ed. New York: McGraw-Hill.
- Drucker, Peter F. (1970). Business objectives and survival needs, Pp. 149-165. in *Technology, management, and society*, New York: Harper & Row.
- Etzioni, Amitai (1964). *Modern Organizations*, Englewood Cliffs, N.J.: Prentice-Hall Inc.
- Fortune 500 (1991). *Fortune*, April 22: 286-356.
- Fruhan, Wm. E. Pyrrhic victories in fights for market share, *Harvard Business Review*, 50 (5): 100-107.
- Gentry, J. A., Newbold, P. & Whitford, D. T. (1985). Classifying bankrupt firms with fund flow components, *Journal of Accounting Research*, Spring: 144-175.
- Gong, G. (1986). Cross-validation, the jackknife and the bootstrap: Excess error estimation in forward logistic regression, *Journal of the American Statistical Association*, (81): 108-113.
- Hall, Richard H. (1987). *Organizations: Structures, processes, & outcomes*, 4th ed. Englewood Cliffs, N.J.: Prentice-Hall.
- Hambrick, Donald C. & D'Aveni, Richard A. (1988). Large corporate failures as downward spirals, *Administrative Science Quarterly*, 33 (March): 1-23.
- Hambrick, Donald C., MacMillian, Ian C. & Day, Diana L. (1982). Strategic attributes and performance in the BCG matrix—A PIMS-based analysis of industrial product businesses, *Academy of Management Journal*, 25 (2): 510-531.
- Hamel, Gary, Doz, Yves L. & Prahalad, C. K. (1989). Collaborate with your competitors: and win, *Harvard Business Review*, (January-February): 133-139.
- Hannan, Michael T. & Freeman, John. (1977). The population ecology of organizations, *American Journal of Sociology*, 82 (5): 929-964.
- _____ (1984). Structural inertia and organizational change, *American Sociological Review*, 49 (April): 149-164.
- Hansen, Gary S. & Wernerfelt, Birger. (1989). Determinants of firm performance: The relative importance of economic and organizational factors, *Strategic Management Journal*, 10 (September/October): 399-411.
- Harrigan, Kathryn Rudie. (1988). Joint ventures and competitive strategy, *Strategic Management Journal*, 9 (2): 141-158.
- Hax, Arnolodo C. & Majluf, Nicolas S. (1984). *Strategic management: An integrative perspective*, Englewood Cliffs, NJ: Prentice-Hall.
- Hill, Charles W. L. & Jones, Gareth R. (1992). *Strategic management, An integrated approach*, 2nd ed., Boston: Houghton Mifflin.
- Howard, George S. (1985). *Basic research methods in the social sciences*, Glenview, Illinois: Scott, Foresman.
- Ijiri, Yuji. (1970). *A Defense for historical cost accounting, in asset valuation*, Robert R. Sterling, Ed., Houston: Scholars Book.
- Jacquemin, Alexis & Berry, Charles (1979). Entropy measure of diversification & corporate growth, *Journal of Industrial Economics*, 29 (3): 359-369.
- Jarillo, J. Carlos. (1988). On strategic networks, *Strategic Management Journal*, 9 (1): 31-41.
- Jensen, Michael C. (1989). Eclipse of the public corporation, *Harvard Business Review*, Sep./Oct.: 61-74.

- Judge, William Q. & Zeithaml, Carl P. (1992). Institutional and strategic choice perspectives on board involvement in strategic decision process, *Journal of Management*, 35 (4): 766-794.
- Keasey, K. & Watson, R. (1987). Non-financial symptoms and the prediction of small company failure: A test of Argenti's hypotheses, *Journal of Business Finance and Accounting*, Autumn: 338-358.
- Kotter, John P. (1979). Managing External Dependence, *Academy of Management Review*, 4 (1): 87-92.
- Liebertson, Stanley & O'Conner, James F. (1972). Leadership & organizational performance: A study of large corporations, *American Sociological Review*, 37 (April): 117-130.
- Lo, Andrew (1986). Logit versus discriminant analysis, A specification test and application to corporate bankruptcies, *Journal of Econometrics*, 31: 151-178.
- Miller, Danny & Friesen, Peter H. (1977). Strategy-making in context: Ten empirical archetypes, *Journal of Management Studies*, 14: 253-280.
- Monsen, Joseph & Downs, Anthony (1965). A Theory of Large Managerial Firms, *The Journal of Political Economy*, (June): 221-236.
- Montgomery, Cynthia. (1982). The measurement of firm diversification: Some empirical evidence, *Academy of Management Journal*, 25(2): 299-307.
- Morita, June G., Lee, Thomas W. & Mowday, Richard T. (1989). Introducing survival analysis to organizational researchers: A selected application to turnover research, *Journal of Applied Psychology*, 74 (2): 280-292.
- Moulton, W.N. & Thomas, H. (1988). Firm growth, industry growth & business failure, *Academy of Management Best Papers Proceedings 1988*, 27-31.
- _____ (1993). Bankruptcy as a deliberate strategy: theoretical considerations and empirical evidence, *Strategic Management Journal*, 9 (2): 125-135.
- Mun, Glenn G. & Garcia, F. L. (1983). *Encyclopedia of Banking and Finance*, 8th ed., Boston: Bankers Book.
- Neilsen, Richard P. (1988). Cooperative strategy, *Strategic Management Journal*, 9 (5): 475-492.
- Owen, Bruce & Brautigam, Ronald. (1980). *The regulation game: Strategic Use of the administrative process*, Cambridge, MA: Ballinger.
- Pennings, Johannes M. (1980). *Interlocking directorates*, San Francisco, CA: Jossey-Bass.
- Pfeffer, Jeffrey & Salancik, Gerald R. (1978). *The external control of organizations, a resource dependence perspective*, New York: Harper & Row.
- Pinches, George E. & Mingo, Kent A. (1973). A multivariate analysis of industrial bond ratings, *Journal of Finance*, (March): 1-18.
- Porter, Michael E. (1980). *Competitive strategy, techniques for analyzing industries and competitors*, New York: Free Press.
- Ravenscraft, David J. (1983). Structure-profit relationships at the line of business and industry level, *Review of Economics and Statistics*, 65 (February): 22-31.
- Rumelt, Richard P. (1974). *Strategy, structure and economic performance*, Cambridge Mass.: Division of Research, Harvard Business School.
- Schelling, I. C. (1960). *The strategy of conflict*, Cambridge Mass.: Harvard University Press.
- Scherer, F. M. (1980). *Industrial market structure and economic performance*, 2nd ed, Boston: Houghton Mifflin.
- Schlesselman, J. J. (1982). *Case-control studies: Design, conduct, analysis*, New York: Oxford University Press.
- Schmalensee, Richard (1985). Do markets differ much? *American Economic Review* 75(3): 341-351.
- Scott, Richard W. (1987). *Organizations: Rational, natural, and open systems*, 2nd ed., Englewood Cliffs, N.J.: Prentice-Hall.
- Seabright, Mark A. (1987). *The dissolution of interorganizational relationships: A case-control study of auditor - client attachments*. Unpublished Doctoral Dissertation: Carnegie Mellon University.
- Selznick, Phillip (1949). *TVA and the grass roots*, Berkeley, CA: University of California Press.
- Sharma, Subhash C. & Giaccotto, Carmelo (1991). Power and robustness of jackknife and likelihood-ratio tests for grouped heteroscedasticity, *Journal of Econometrics*, 49 (3): 343-372.
- Shepherd, William G. (1972). The elements of market structure, *The Review of Economics and Statistics*, 54 (1): 25-37.
- Sheppard, Jerry Paul. (1989). *The strategy of corporate survival: A resource dependence approach*, Unpublished Doctoral Dissertation (University of Washington).
- _____ (1992). When the going gets tough, the tough go bankrupt: The questionable use of chapter 11 as a strategy, *Journal of Management Inquiry*, 1 (3): 183-192.
- Sherman, S. P. (1991). Bankruptcy's spreading blight, *Fortune*, June 3: 123-132.
- Sills, David L. (1957). *The volunteers*, New York: Free Press.
- Singh, Jetendra V. (1986). Performance, slack, and risk taking in organizational decision making, *Academy of Management Journal*, 29 (2): 562-585.

- Singh, Jetendra V., House, Robert J. & Tucker, David J. (1986). Organizational change and organizational mortality, *Administrative Science Quarterly*, (4): 587-611.
- Singh, Jetendra V. & Lumsden, Charles J. (1990). Theory and research in organizational ecology. Pp. 166-195 in W. R. Scott and J. Blake (eds.) *The annual review of sociology*, Palo Alto, CA: Annual Reviews.
- Smart, Carolyn & Vertinsky, Ian (1977). Designs for crisis decision units. *Administration Science Quarterly*, 22: 640-657.
- Staw, Barry M., Sandelands, Lance E. & Dutton, Jane E. (1981). Threat-rigidity effects in organizational behavior: A multilevel analysis, *Administration Science Quarterly*, 26: 501-524.
- Stinchcombe, Arthur S. (1965). Social structure and organizations. Pp. 153-193 in James G. March (ed.) *Handbook of organizations*. Chicago: Rand-McNally.
- Stonich, Paul J. (1981). Using rewards in implementing strategy, *Strategic Management Journal*, 2 (4): 345-352.
- Thompson, James D. (1967). *Organizations in Action*, New York: McGraw-Hill.
- Thorelli, Hans B. (1986). Networks between markets and hierarchies, *Strategic Management Journal*, 7 (1): 37-51.
- Veron, John M. (1972). *Market structure & industrial performance: A review of statistical findings*, Boston: Allyn Bacon.
- West, Richard R. (1985). Inside directors & former corporate officers as board members. Pp. 25.3-25.10, in E.P. Mattar & M. Ball (eds.), *The handbook for corporate directors*, New York: McGraw-Hill.
- Weston, Fred & Mansighka, Surenda. (1971). Tests of the efficiency performance of conglomerate firms, *Journal of Finance*, (September): 919-936.
- Whetten David A. (1988). Organizational growth & decline processes, Pp. 3-19, in Kim S. Cameron, Robert I. Sutton & David A. Whetten (eds.), *Readings in organizational decline, frameworks, research, & prescriptions*, Cambridge, MA: Ballinger.
- Zahra, Shaker A. & Pearce, John A. II (1989). Boards of directors and corporate financial performance: A review and integrative model, *Journal of Management*, 2: 291-334.
- Zavgren, Christine V. (1985). Assessing the vulnerability to failure of American industrial firms: A logistic analysis, *Journal of Business and Accounting*, 12 (1): 19-45.
- Zmijewski, Mark E. (1984). Methodological issues related to estimation of financial distress prediction models, *Journal of Accounting Research*, 22 (Supplement): 59-86.