AN EMPIRICAL INVESTIGATION OF THE DYNAMICS OF FINANCIAL DISTRESS

by

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DEDICATION

This dissertation is gratefully dedicated to

my parents, James and Sandra, and Jamie,

for their unending support and encouragement through the years.

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ABSTRACT

In this dissertation, I conduct a comprehensive empirical analysis of financial distress among U.S. publicly-traded non-financial corporations. I provide two significant contributions to the corporate finance literature, as detailed in Parts I and II. In Part I, I develop and test a parsimonious model that measures a firm's financial condition. A firm's *Financial Condition Score* (FCS) is based on three variables: the firm's size, its leverage, and the standard deviation of the firm's assets (imputed using the firm's stock returns and the Black-Scholes Option Pricing Model). Initially, I estimate the coefficients for these variables for year-end t by means of a probit regression of rated firms' Standard & Poor's numerical credit rating. Then I use these estimated coefficients to calculate a FCS for all firms, both rated and unrated. FCS are calculated for 3,689, 3,910, and 4,777 firms at years-end 1988, 1993, and 1998, respectively. These FCS are effective in sorting firms according to their future failure rates; the vast majority of firms that delist for performance (i.e., 'fail') by year-end t+3 sort into the two highest FCS (i.e., highest-risk) quintiles.

In Part II, I focus on the most distressed firms, defined at year-end t as those firms in the highest-risk FCS quintile. I examine year t+1 cash-flow data for these firms, especially their net cash flows from operations, investment, and (external) financing activities, and the relation between these cash flows (in isolation and in tandem) and failure rates as of year-end t+3. Among the major results, I find evidence of a strong inverse relation between operating performance during distress and failure rates. Distressed firms that issue debt are more likely to fail than distressed firms that issue equity. Finally, distressed firms issue equity as often as, and sometimes more often than,

they issue debt. The empirical results have implications for several important hypotheses in corporate finance, including the Traditional Tradeoff Theory and the Pecking Order Hypothesis, among others.

JEL classification: G3

Key words: Financial distress, Financial Condition Score, Survival rates

Part I: The Measurement of Distress

1. Introduction

What is distress and, more importantly, how should it be measured? Researchers define *financial distress* in various ways. According to Andrade and Kaplan (1998), a firm is *financially* distressed when it cannot make its debt payments and is *economically* distressed when it sustains an operating loss. Wruck (1990) defines financial distress as "a situation where cash flow is insufficient to cover current obligations," where current obligations include unpaid debts to suppliers and employees, actual or potential damages from litigation, and missed principal or interest payments (p. 421). By this broader definition, all-equity firms are also prone to financial distress.

In the literature on firm responses to financial distress, previous researchers utilize a number of different criteria to identify distressed firms. Gilson, John, and Lang (1990) measure financial distress using past three-year stock returns. John, Lang, and Netter (1992) identify financially distressed firms by poor earnings performance. Other researchers simply focus on interest coverage ratios. There appears to be a lack of consensus in the finance literature on the most appropriate way to measure distress.

Moreover, there is a surprising disconnect between the extant research on financial distress and the bond rating literature. The purpose of Part I is to bridge this gap by utilizing bond rating explanatory variables to develop a new measure of *financial condition* for all publicly-traded firms. In the discussion and analyses that follow, a firm is financially distressed if its overall financial condition places the firm at high risk for future failure, where 'failure' includes a broad set of negative outcomes. The goal is to

develop a new method of identifying distressed firms so that the responses (i.e., *dynamics*) of such firms can be examined in Part II.

The organization of Part I is as follows: Section 2 contains a literature review of relevant research on the prediction of firm failure, the identification of distressed firms, and the determinants of bond ratings, Section 3 sets forth the hypotheses for the development of a new measure of financial condition, Section 4 describes the research methodology, Section 5 presents results, and Section 6 concludes.

2. Literature Review

A. Prediction of Firm Failure

Several studies, most appearing in the accounting literature, attempt to predict the unconditional probability of firm failure (see Table 1). Beaver (1966) is the first to use financial ratios to this end. He separately tests a variety of ratios for matched samples of failed and non-failed firms over the period 1954-1964 and finds that the ratios of cash flow to total assets, net income to total assets, total debt to total assets, and cash flow to total debt are significant failure predictors.

Altman (1968) employs multiple discriminant analysis (MDA) to develop a predictor of bankruptcy based on a small sample of manufacturing companies. The Altman model results in a Z-score that is a weighted average of the following ratios: working capital to total assets, retained earnings to total assets, earnings before interest and taxes (EBIT) to total assets, market value of equity to total liabilities, and sales to total assets.

Subsequently, Altman et al. (1977) revises the original bankruptcy prediction model using a larger sample including both manufacturing and retail firms. The resulting ZETA model is based on seven variables: return on assets, earnings stability, debt service, cumulative profitability, current ratio, market capitalization, and size (total tangible assets).

Through estimation of a conditional logit model, Ohlson (1980) finds that four factors are statistically significant bankruptcy predictors: size (natural log of total assets divided by GNP) and the ratios of total liabilities to total assets, net income to total assets, and working capital to total assets. Begley et al. (1996) compares the classification errors of the Altman and Ohlson models using both original and re-estimated versions and finds that Ohlson's original model "displays the strongest overall performance" (p. 267).

Queen and Roll (1987) investigate the ability of market-based variables to predict "firm mortality." The authors consider a broad set of possible outcomes, making a distinction between those that are 'favorable' and 'unfavorable' to shareholders. Favorable outcomes include CRSP delisting categories for merger, exchange, and liquidation, while unfavorable results include categories for delist, halted trading, and suspension by the Securities and Exchange Commission. Their analysis of size (market capitalization), price per share, total return, variance of return, and beta indicates that all except beta are useful in predicting firm mortality.

More recently, Shumway (2001) estimates a discrete-time hazard model of bankruptcy prediction utilizing a logit model estimation program. He finds that "about half of the accounting ratios that have been used in previous models are not statistically significant bankruptcy predictors," while firm size, past cumulative stock returns, and the

idiosyncratic standard deviation of stock returns are strongly related to the probability of bankruptcy (p. 101). Shumway's results support our contention that most previously used accounting variables are not needed in measuring financial condition.

B. Finance Literature: Identification of Distressed Firms

In general, finance researchers focus less on the prediction of firm failure *per se* than on the identification of distressed firms for some specific investigative purpose (see Table 2). For example, Gilson, John, and Lang (1990) examine the probability that a firm will file for Chapter 11 versus privately restructure its debt conditional on poor past stock price performance. By and large, researchers sort firms by one or more variables expected to relate to the probability of financial distress.

Several researchers use past cumulative stock returns as a screen to identify financially distressed firms. Gilson, John, and Lang (1990) select firms with an unadjusted three-year stock price performance in the bottom 5% of all NYSE/AMEX firms. Similarly, Ofek (1993) defines short-term distress as an annual unadjusted stock return in the bottom 10% of all NYSE, AMEX, and Nasdaq stocks following a year in which the return was in the top 67% of all stocks.

A number of researchers use other measures. Opler and Titman (1994) identify a 3-digit SIC industry as economically distressed when (1) median sales growth is negative, and (2) median stock return is below -30%. Asquith, Gertner, and Scharfstein (1994) utilize interest coverage ratios. John, Lang, and Netter (1992) study firms with at least one year of negative earnings (over 1980-1987) followed by at least 3 years of positive earnings. Finally, Andrade and Kaplan (1998) use two basic measures of financial

distress: (1) default on a debt payment, or (2) indication of an attempt to restructure debt due to difficulty in making payment.

The measurement of distress extends beyond corporate finance to the recent asset pricing literature. In a study of equilibrium anomalies, Ferguson and Shockley (2003) create portfolios based on relative leverage and relative distress, where distress is measured using Altman's (1968) Z-score. Griffin and Lemmon (2002) examine the relation among book-to-market equity, distress risk, and stock returns, and measure distress risk using Ohlson's (1980) O-score. The number of different criteria extant in the literature clearly suggests a lack of consensus on the best measure of distress.

C. Bond Ratings and Default Risk

A separate strand of the finance literature addresses bond rating determinants and provides evidence of the ability of bond ratings to measure the ex ante probability of default (see Table 3). Since the 'Financial Condition Score' developed in Part I is based on bond ratings, a review of the relevant credit rating literature is warranted.

Early researchers utilize multiple regression analysis to find determinants of bond ratings. Horrigan (1966) finds that size (measured by total assets), a subordination dummy variable, and the ratios of working capital to sales, net worth to total debt, sales to net worth, and operating income to sales explain over 50% of the variation in Moody's and Standard & Poor's bond ratings, with size being the most important explanatory variable. Pogue and Soldofsky (1969) find that six-year averages of the following ratios best explain variation in Moody's ratings: long-term debt to firm value, net income to total assets, coefficient of variation of net income to total assets, net total assets, and net

income plus interest to interest. Finally, West (1970) selects explanatory variables used by Fisher (1959) to explain bond risk premiums. West obtains an R-Square of 0.74 using the following set of independent variables: (Logs of) nine-year earnings variability, length of time the firm operated without forcing creditors to take a loss (i.e., period of solvency), leverage (market value of equity divided by debt), and market value of outstanding bonds.

Subsequent research employs discriminant and probit analysis. Pinches and Mingo (1973) use multiple discriminant analysis and find that the best set of explanatory variables includes a subordination dummy variable, years of consecutive dividends, issue size, ratio of net income to total assets, and five-year averages of the ratios of net income plus interest to interest and debt to total assets. Kaplan and Urwitz (1979) find that a model including a subordination dummy, total assets, beta, and the ratio of debt to total assets correctly classifies 65% of sample bonds. Ogden's (1987) probit analysis indicates that leverage (debt divided by firm market value) and firm return standard deviation explain 78% of the variation in S&P credit ratings, with the addition of firm size (natural log of firm value) improving the model. More recently, Blume et al. (1998) include size (natural log of market equity value divided by consumer price index), the ratio of debt to total assets, and market model beta and standard error among their set of S&P bond rating explanatory variables.

Less research focuses on the relation between bond ratings and subsequent default. Hickman (1958) finds a positive relation between initial bond quality ratings and default. More notably, Altman (1989) documents mortality rates (for up to ten years after issuance) across original S&P bond ratings over the period 1971 to 1987. Altman's

mortality rate for year t is defined as the total value of defaulting debt in year t divided by the total value of the population of bonds at the start of year t, and the cumulative mortality rate over T years is equal to 1 minus the product of surviving populations in each of the previous years. Altman finds that high-rated debt has very low mortality rates while low-rated debt has high mortality rates. Specifically, AAA-rated debt has a cumulative mortality rate of zero for five years after issuance and only 0.13% for ten years after issuance. In contrast, B-rated debt has cumulative mortality rates of 11.5% and 31.9% for five and ten years after issuance, respectively.

Finally, a substantial body of research addresses default risk in the context of Black and Scholes's (1973) framework of equity as a call option on a firm's debt. Merton's (1974) 'Contingent Claims Model' elucidates this approach. The key result of Merton's model is that default risk is captured by leverage and firm return standard deviation. The aforementioned Ogden (1987) study generally supports the model; Merton's two risk measures explain a substantial percentage of the variation in credit ratings, though the addition of size improves the model. Other recent research suggests that the Merton model has gained practical acceptance. The KMV Corporation, a provider of quantitative credit analysis, employs a variant of the Merton model to measure default risk (Kealhofer (2003)). Huang and Huang (2003) utilize the contingent claims framework to show that the corporate-treasury yield spread is too high to be accounted for in terms of default risk alone. Thus it is important to estimate the probability of firm failure, and the remainder of Part I addresses this task.

3. Hypotheses

The purpose of Part I is to develop a measure of a public firm's financial condition. The literature review indicates that many studies estimate the unconditional probability of bankruptcy using a number of different accounting-based ratios, while a few papers also incorporate market-driven variables. Much of the finance literature sorts firms by variables expected to relate to financial distress in general. In this section, I assess a firm's financial condition using a new approach based on the extant bond rating literature.

The first step in the development of the Financial Condition Score (FCS) is the identification of the dependent and independent variables. The dependent variable in the analyses that follow is Standard & Poor's (S&P) numerical credit rating. Credit ratings are designed to measure the ex ante probability of financial distress for leveraged firms. According to the S&P Compustat data manual, the S&P long-term domestic issuer credit rating is "a current opinion of an issuer's overall creditworthiness" that "focuses on the obligor's capacity and willingness to meet its long-term financial commitments (those with maturities of more than one year) as they come due" (p. 231). Thus, a firm's S&P credit rating can be construed as a measure of its financial condition.

The use of bond ratings to measure financial condition has been limited by the relatively small proportion of publicly-traded firms with rated debt. Credit ratings are typically only granted to large, established firms, in large part because public debt is issued almost exclusively by such firms (Ogden et al. (2003)). However, if we can identify the variables that explain credit ratings, we can then utilize these variables to develop a *pseudo-rating* to measure the financial condition of all firms. Altman (1989)

provides empirical evidence that supports the use of bond ratings in developing a distress measure; bonds with high initial ratings have very low mortality rates (over the ten-year period after issuance) while initially low-rated debt have high mortality rates.

The choice of independent variables is grounded in both theory and empirical evidence; the literature review reveals that market-driven variables have become increasingly important both in predicting distress (Shumway (2001)) and in explaining bond ratings (Blume et al. (1998)). The explanatory variables and the rationale for their selection follow. The measurement of these variables is detailed in Section 4.

Variable 1: Leverage

Most bankruptcy prediction models include some form of leverage as an explanatory variable. Intuitively, a firm with higher leverage faces a greater probability of not being able to make all of its principal and interest payments, *ceterus paribus.* Nearly all previous studies of bond rating determinants utilize leverage and document a positive relation between (numerical) bond ratings and leverage (Pogue and Sodolfsky (1966), Pinches and Mingo (1973), Kaplan and Urwitz (1979), et al.). Merton's (1974) Contingent Claims model asserts that default risk is captured by leverage and firm return standard deviation. Thus,

Hypothesis 1: Firms with higher leverage have higher numerical credit ratings.

Variable 2: Size

Theory suggests that size plays an important role in many aspects of financial analysis. With respect to credit ratings, larger firms "tend to be older, with more

diversified product lines and more varied sources of revenues" (Blume et al. (1998)) and thus will tend to have better credit ratings, *ceterus paribus* (p. 1394). Fisher (1959) argues that the larger the amount of public debt outstanding, the higher the debt's liquidity, and thus, the lower its yield. Many studies, employing different research designs and various measures of firm size, find empirical evidence of a positive relation between size and credit quality (Horrigan (1966), West (1970), Ogden (1987), et al.). Thus,

Hypothesis 2: Larger firms have lower numerical credit ratings.

Variable 3: Standard Deviation of Assets (σ_A)

As previously mentioned, Merton (1974) identifies firm return standard deviation as one of two default risk factors. The standard deviation of equity returns (i.e., *equity risk*) depends, in part, on a firm's capital structure (i.e., relative use of debt financing). Since leverage is already included as an explanatory variable, we would like a measure of risk that is independent of firm financing, or in other words, firm *business risk.* Although business risk can refer to the standard deviation of a firm's operating earnings, in the analyses and discussion that follow 'business risk' refers to a firm's asset return volatility. In theory, a firm with higher business risk faces a higher probability of not being able to meet its financial obligations. Thus,

Hypothesis 3: Firms with higher business risk (σ_A) have higher numerical credit ratings.

The standard deviation of assets is negatively correlated with leverage, particularly for smaller firms. Firms with higher business risk often *choose* to have less

debt in their capital structure to lower the risk of future distress. Note also that for an all-equity firm the standard deviation of equity is equal to the standard deviation of assets. In other words, an all-equity firm's shareholders bear all of the firm's business risk.

I initially included one additional independent variable, median Fixed Charge Coverage Ratio (i.e., Earnings before interest and taxes divided by interest). However, this variable is undefined for an all-equity firm because the denominator is equal to zero. Since I am interested in the distress responses of both levered and unlevered firms, I do not include this variable in the analysis. In unreported results, including the most recent three-year median of FCC as an additional explanatory variable in the analyses that follow had a negligible effect on adjusted R-square.

One could argue for the inclusion of other explanatory variables. However, the addition of other independent variables increases the number of firm-year observations that must be omitted due to missing or extreme data values. One must balance the trade-off between the maximization of adjusted R-square and the loss of observations. Since the goal of this exercise is to develop a measure of financial condition that can be applied to all publicly-traded firms, I err on the side of parsimony and include only the three variables deemed to be most relevant.

Among other possible explanatory variables, book-to-market potentially holds the most promise. Previous research has found a significant positive relation between book-to-market and the cross-section of expected stock returns. Fama and French (1992) find that size and book-to-market equity capture the cross-sectional variation in average stock returns. However, they do not include firms with negative book equity, but note that "average returns for negative BE firms are high, like the average returns of high BE/ME

firms. Negative BE (which results from persistently negative earnings) and high BE/ME (which typically means that stock prices have fallen) are both signals of poor earnings prospects. The similar average returns of negative and high BE/ME firms are thus consistent with the hypothesis that book-to-market equity captures cross-sectional variation in average returns that is related to relative distress" (p. 441). Similarly, Fama and French (1993, 1995) do not include negative BE firms when forming size-BE/ME portfolios.

While Fama and French (1992, 1993, 1995) choose to disregard firms with negative book equity, omitting such firms from our analysis would have the unintended result of excluding some distressed firms, because distressed firms might have either negative book equity or a book-to-market equity ratio greater than one. The proportion of firms with negative book equity is small. At year-end 1988, for example, 38 (6.1%) of 624 firms with debt rated by S&P have negative book equity, compared to 162 (4.4%) of 3,689 total sample firms. Nonetheless, the inclusion of book-to-market as an explanatory variable is problematic due to non-linearity caused by the incidence of negative book equity firms.

Thus, due to problems associated with the book-to-market variable, I do not include this variable in the final model. However, I do conduct preliminary analyses to determine whether either book-to-market or three-year past stock returns (discussed earlier) are important explanatory variables for bond ratings *after* firm size, leverage, and standard deviation of assets are included. These preliminary results are separately reported in Section 5.

4. Data and Methodology

Data on the Center for Research in Securities Prices (CRSP) monthly stock file and Standard & Poor's Compustat Annual File form the basis for my analyses. The Compustat annual file includes industrial, full-coverage, and research files and is the source for all accounting data as well as price per share and number of shares outstanding. Past returns (needed for the computation of σ_A) are extracted from the CRSP monthly stock file.

The sample includes all NYSE, AMEX, and Nasdaq stocks at year-end t, where t =1988, 1993, and 1998. The first sample period begins in 1988 because cash flow variables on Compustat (needed for Part II) are not available until 1987, and 1988 is the first year for which cash flows are available for most firms. Since two of the three sample years (i.e., 1988 and 1998) end in recession and one (i.e., 1993) ends in a boom, we can examine the possible effect of ex post recession on financial distress.

I exclude financials (CRSP Standard Industrial Classification (SIC) codes from 6,000 to 6,999) and utilities (CRSP SIC codes from 4,910 to 4,949). I omit foreign firms by requiring that the Compustat Foreign Incorporation Code (FINC) equals zero. Finally, I impose the condition that a firm must have data for all twelve monthly returns in year t. This ensures that no sample firm is delisted during the return computation period while simultaneously restricting the analysis to relatively seasoned firms.

For each year t, I assess the power of the selected independent variables to explain S&P numerical credit ratings for rated firms. The objective is to derive a relation between the set of independent variables and bond ratings such that this relation can be applied to develop a *pseudo-rating* for all firms (i.e., both rated and unrated firms) at

year-end t. Since the dependent variable is categorical and ordinal I utilize an ordered probit model, consistent with previous researchers (Blume et al. (1998)).

Dependent variable data is collected as follows. I collect the S&P numerical long-term industrial credit rating from the Compustat Industrial Annual File for all sample firms at year-end t. As shown in Table 4, the S&P numerical credit rating is an integer between 2 and 27, where 2 corresponds with AAA-rated debt and 27 with D-rated debt (i.e., payment is in default). Thus, higher numerical ratings indicate higher probability of default.

The independent variables are defined as follows. Leverage is based on total long-term debt, which is Compustat data variable 9. Firm value is the sum of the book value of debt (data9) and the market value of equity, MVE, where MVE is equal to price per share (data199) times the number of common shares outstanding (data25). Firm size is measured as the natural logarithm of firm value, as defined.

The standard deviation of assets (σ_A) is imputed using the Black-Scholes Option Pricing Model (BSOPM). The application of the BSOPM requires assumptions on values of T, the debt's time to maturity, and the risk-free rate, r_f. I assume that T is equal to 10 years. The average 1-year Treasury bill rate during the FCS computation period (i.e., year-end 1988 through year-end 1998) is 6.8%. For simplicity, I assume that the risk-free rate is 6%.

For each firm I initially calculate the annualized standard deviation of equity (σ_E) as the standard deviation of monthly returns over the (36-month) period beginning in year t-2 and ending at year-end t, times the square root of 12. I then use σ_E to derive σ_A as

follows. Jones, Mason, and Rosenfeld (1984), in an empirical test of Merton's contingent claims theory, used Ito's Lemma to derive the relation between σ_E and σ_A. The relation is:

$$\sigma_E = \sigma_A E_V V/E \quad (1)$$

I initially set $E_V=1$, and then iterate as per Ogden (1987) to impute σ_A.

There is a timing issue involved. To the extent that S&P numerical credit ratings are adjusted in response to reported accounting data, it is uncertain whether a year-end t credit rating reflects year-end t-1 or year-end t data. Thus, I initially estimated an Ordinary Least Squares regression using lagged independent variable data (t-1). In unreported results, the adjusted R-square for contemporaneous data is higher than that associated with lagged data. Thus, the subsequent bond rating analyses use contemporaneous data. While use of contemporaneous data is subject to the criticism that it is unobservable at time t, the purpose of Part I is simply to find the best set of coefficients to measure distress. In the end, we do not know how much information S&P can employ in assigning a credit rating for a firm at year-end t.

The probit analysis and computation of FCS are as follows. The ordered probit model uses the independent and dependent variable data for rated firms, along with the independent variable data for unrated firms, to assign the highest probable rating category to all firms. Probit also assigns an intercept to each k-1 rating category, and the intercept corresponding to a given firm's highest probable rating category is the intercept used in that firm's FCS computation. For rated firms I use the intercept corresponding to the assigned highest probable rating instead of the intercept matching the actual rating to avoid a bias in the calculation of FCS for rated firms. The coefficients of size, leverage, and the annualized standard deviation of assets obtained from the probit analysis

(common to all firms) are then applied to each firm's set of independent variables to obtain a 'preliminary' FCS.

I regress the 'preliminary' FCS on S&P credit ratings for the sample of rated firms to assess the power of FCS to explain bond ratings. The coefficient of FCS in each year is close to one and the adjusted R-square is high (e.g., 0.75 in 1988), indicating that FCS captures a significant proportion of the variation in credit ratings. However, in 1988 for example, the intercept is 10.25. Since the probit analysis yields k-1 intercept terms, this intercept is treated as the missing intercept common to all firms. Because FCS is intended to serve as a pseudo-rating for all firms, this intercept is added to each firm's 'preliminary' FCS such that the distribution of FCS is more closely aligned with the distribution of S&P credit ratings. In 1988, for example,

$$FCS_i = 10.2548 + Intercept_k - 0.5983(Size_i) + 7.6501(Lev_i) + 9.1014(\sigma_{Ai}) \quad (2)$$

Once FCS has been calculated, the full sample is divided into quintiles, where quintile 1 (5) firms have the highest (lowest) FCS. The Part II analysis that follows will then focus on the most distressed firms, i.e., those in quintile 1.

5. Results

Initially I conduct some preliminary tests of independent variable selection. These preliminary results are reported in Section A. The main results of the final model are discussed in Section B.

A. Preliminary Results

I first investigate the explanatory power of various combinations of potential independent variables using Ordinary Least Squares regression. A summary is provided in Table 5. In an attempt to incorporate book-to-market (B/M), I include a dummy variable with value equal to one if B/M is negative or greater than one, and zero otherwise. This variable, by itself, has a significantly positive coefficient and explains 13.6% of the variation in S&P credit ratings. However, the size of the coefficient decreases substantially when added to the original model. Past three-year stock returns, by itself, has a significantly negative coefficient and explains 7.2% of the variation in credit ratings. Like the coefficient of B/M, however, the size of the coefficient of past returns decreases significantly when added to the original model. Finally, a regression model with five explanatory variables yields an adjusted R-square that is only 0.1% higher than the adjusted R-square obtained with the original three-variable model. Thus, the three-variable model seems adequate and subsequent bond rating analyses use only leverage, size, and the annual standard deviation of assets.

B. Main Results

Initially, I investigate the relations among the selected independent variables. The results of univariate regressions of leverage on the annual standard deviation of assets (σ_A) and on firm size are presented in Table 6 Panels A and B, respectively. Firms with higher business risk tend to have lower leverage and larger firms generally have higher leverage, as expected. Business risk explains a higher percentage of the variation in leverage than does size.

Panel C of Table 6 presents the correlation matrices for the set of explanatory variables in each of the three sample years. The signs and magnitudes of the coefficients are generally consistent with expectations. For example, the correlation between size and the annual standard deviation of assets ranges from -0.35 to -0.44. The correlation between size and leverage ranges from 0.12 to 0.14; again, larger firms tend to have higher leverage. Finally, the correlation between leverage and the annual standard deviation of assets ranges from -0.34 to -0.52. Firms that have higher business risk might choose lower leverage to limit their exposure to future distress.

Table 7 shows the intercepts, coefficients, and R-squares obtained from the probit analysis of bond ratings in each sample year. The probit analysis yields a maximum re-scaled R-square that ranges from 74.4% to 80.0%; size, leverage, and the annual standard deviation of assets explain a substantial percentage of the variation in credit ratings.

Descriptive statistics for rated and unrated firms in each sample year are presented in Table 8. The distribution of FCS is similar to the distribution of S&P credit ratings for rated firms; the means, medians, minimums, and maximums of FCS and SP are comparable. Rated firms tend to be larger, more levered, and less risky than unrated firms, and the differences in means between rated firms and unrated firms are highly statistically significant.

Before utilizing FCS to identify distressed firms in Part II, I investigate its performance as a distress measure. If FCS is a good measure of distress, then there should be a higher frequency of delists among firms with higher scores.

I collect the variable 'delisting code' from the CRSP monthly stock file for each firm over the three-year period from year t+1 to year-end t+3, where FCS is computed at year-end t. The outcome categories are those used by Fama and French (2003) in a study of the survival of newly listed stocks. The three possible outcomes are: (1) delist for performance (delist code 400+), (2) delist for merger/acquisition (delist code 200-399), and (3) still trading (missing delist code).

The motivation for examining performance delists is clear. A separate strand of the literature investigates mergers and acquisitions as a resolution to distress. A merger or acquisition can allow a financially distressed firm to avoid the deadweight costs associated with bankruptcy (Manne (1965), Haugen and Senbet (1978)). Shrieves and Stevens (1979) show that approximately 15% of their sample of merged firms were close to insolvency. Martin and McConnell (1991) find that target firms underperform other industry firms prior to the takeover and that target management turnover increases after the takeover. Thus, I separately document the rate of delists associated with mergers and acquisitions.

I present Table 9 to provide the reader with more detailed information on the CRSP 'delisting code' variable. The table shows the relative frequencies and descriptions of delist codes for all firms that delisted between January 1989 and December 1991, the three-year period following the first sample year. A total of 1,270 nonfinancial, non-utility firms delisted during this three-year period. 36% of all delists can be categorized as 'merger' versus 64% that can be attributed to 'performance.'

For each sample year (i.e., 1988, 1993, and 1998) I determine the three-year delisting outcome of all firms by quintile. Expectations regarding the frequency of delists

across quintiles are as follows. Firms in the bottom quintile are the worst performers and will be more likely to delist for any reason. As FCS decreases across firms (i.e., condition improves), total delists also decrease. Thus,

Hypothesis 4: Total delists are highest among quintile 1 firms and lowest among quintile 5 firms.

The expected frequency distribution of delists for merger/acquisition by FCS quintiles is bimodal. Firms in the bottom quintile are more likely to delist for any reason, including for merger. However, firms in the top quintile have performed well and may also be attractive merger targets. Thus,

Hypothesis 5: The distribution of mergers and acquisitions is bimodal; the highest proportion of mergers/acquisitions occurs in quintiles 1 and 5.

Finally, quintile 1 firms tend to be those with relatively high leverage. To the extent that high leverage makes them less attractive takeover targets, they are more likely to be delisted for performance (e.g., declare bankruptcy or liquidate). Thus,

Hypothesis 6: The proportion of quintile 1 firms that are merged or acquired is significantly lower than the percentage that delist for poor performance.

The three-year delisting results for each sample period are shown in Table 10. Consistent with Hypothesis 4, the total number of delists is highest in quintile 1 and decreases monotonically across quintiles in each year. Results are inconsistent with Hypothesis 5; the number of merger delists is lowest in quintile 1 and peaks in quintiles 3

and 4. Finally, consistent with Hypothesis 6, the number of performance delists is significantly higher than the number of merger delists for quintile 1 firms. Compared to delists associated with poor performance, mergers are not a frequent distress outcome. As a result, in Part II I focus only on delists for performance.

Quintiles 1 and 2 consistently account for the majority of performance delists. Quintiles 1 and 2 account for 86% of all performance delists in 1988, 85% in 1993, and 77% in 1998. Thus, empirical evidence indicates that FCS does an excellent job of sorting firms by severity of distress.

For comparison purposes, I repeat the above analysis for quintiles based on 3-year holding period returns for the first sample year. In other words, quintile 1 firms are those with the lowest 3-year holding period returns over 1986-1988. The results are shown in Table 11. Again, total delists and delists for performance are highest in quintile 1. However, quintiles 4 and 5 account for 13.8% of all performance delists in 1989-1991 versus only 5.6% when sorted by FCS. Further, quintiles 1 and 2 account for 74% of all performance delists versus 86% when sorted by FCS. Thus, it appears that FCS does a better job of classifying firms in severe distress.

Finally, as a test of the ability of bond ratings to predict subsequent delistings, I repeat the analysis using quintiles based on year-end 1988 S&P numerical credit ratings. The results are reported in Table 12. As expected, few rated firms delist for performance; only 14 out of 624 total firms had a delisting code of 400 or higher. Interestingly, however, 9 out of the 14 performance delists sort into quintile 1 and the remaining 5 firms rank in quintile 2. Thus, S&P numerical credit ratings, the basis for the FCS, appear to do a good job of measuring the ex ante probability of distress.

6. Conclusion

The purpose of Part I is to develop a parsimonious measure of distress. The focal point of the analysis is the S&P numerical credit rating as a measure of distress. Credit ratings are typically granted to only large, established firms. I assess financial condition for a larger population of publicly-traded firms by using a small but powerful set of independent variables that explain bond ratings.

Having established a set of coefficients based on the ordered probit model, FCS are calculated for 3,689, 3,910, and 4,777 firms at years-end 1988, 1993, and 1998, respectively. These FCS are effective in sorting firms according to their future failure rates; the vast majority of firms that delist for performance (i.e., 'fail') by year-end t+3 sort into the two highest FCS (i.e., highest-risk) quintiles. In Part II, I will focus on the most distressed firms, defined at year-end t as those firms in the highest-risk FCS quintile.

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Table 1
Literature Review: Prediction of Firm Failure

Author(s)	Dependent Variable	Independent Variable(s)	Methodology
Beaver (1966)	Failure Includes bankruptcy, default, overdrawn bank account, nonpayment of preferred stock dividends	CF/TA, NI/TA, TD/TA, and CF/TD	Comparison of matched samples of failed and non-failed firms Univariate 1954-1964
Altman (1968)	Bankruptcy	WC/TA, RE/TA, EBIT/TA, MVE/TD, and Sales/TA	Multiple Discriminant Analysis (MDA) 1946-1965
Ohlson (1980)	Bankruptcy	Log(TA/GNP), TL/TA, NI/TA, and WC/TA	Conditional Logit model 1970-1976
Zmijewski (1984)	Bankruptcy	NI/TA, TL/TA, and CA/CL	Probit 1972-1978
Casey and Bartczak (1985)	Bankruptcy	CFO, CFO/CL, and CFO/TL	MDA and Conditional Logit 1971-1982
Gentry et al (1985)	Failure Includes bankruptcy and liquidation	Seven funds flow components and Total Net Flows/TA	MDA, Probit, and Logit 1970-1981
Lau (1987)	Five financial states (0) financial stability, (1) omit or reduce divs, (2) default, (3) Ch 10 or 11, (4) bankruptcy and liquidation	7 financial flexibility variables, 2 trend variables (Cap Exp and WC), and 1 indicator of current financial state (dummy = 1 if divs are omitted or reduced more than 40% in period)	Logit 1972-1977
Queen and Roll (1987)	Mortality Non-survival includes mergers, exchanges, liquidations, delists	Size (price x shrsout), Price, Total Return, Variance of Return, and Beta	Finds cumulative mortality by deciles for each predictor variable.
Shumway (2001)	Bankruptcy	Altman and Zmijewski variables, plus: Relative size, past excess returns, and σ	Logit 1962-1992
Fama and French (2003)	Survival (of new lists) 3 possible outcomes: Survival, Merger, or Delist for performance	Average profitability (EBIT/TA) and Growth in assets (dA/A)	Examines profitability and growth of firms for 1 to 5 years before each possible outcome.

Table 2

Summary of Recent Research on Financial Distress

Author(s)	Definition of Financial Distress	Measure
Andrade & Kaplan (1998)	Inability to meet fixed payment obligations on debt.	Default on debt payment (possibly leading to Ch 11 filing) or indication of attempt to restructure debt due to difficulty in making payment.
Asquith et al (1994)	Not specifically stated. Inferred as the inability to make payments on debt.	In any two consecutive years, EBITDA less than reported interest expense, or, in any one year, EBITDA less than 80% of interest exp.
Gilson (1989)	Inability to meet fixed payment obligations on debt.	Default on debt, bankrupt (Ch. 7 or Ch. 11), or privately restructuring debt to avoid bankruptcy.
Gilson, John, & Lang (1990)	Insufficient cash flows to meet payments on debt.	First, firms with 3-year cumulative unadjusted stock returns in bottom 5% of NYSE/AMEX firms. Second, of these firms, those with reference to default, bankruptcy, or debt restructuring in WSJ Index.
John, Lang, & Netter (1992)	Not specifically stated. Firms "subject to financial distress" are those with negative earnings.	At least one year of negative earnings between 1980 and 1987, followed by three years of positive earnings.
Ofek (1993)	Not specifically stated. "Short-term financial distress" refers to one year of poor stock price performance.	Annual stock return in bottom 10% of all NYSE,AMEX, and Nasdaq stocks following a year in which returns were in top 67%
Opler & Titman (1994)	Not specifically stated. Inferred as the inability to make payments on debt.	Studies relation between capital structure (leverage) and performance of firms in *economic* distress
Wruck (1990)	Cash flow insufficient to cover current obligations. Current obligations include: Unpaid debts to suppliers and employees, actual or potential damages from litigation, and missed princ./int. payments on debt.	N/A (Survey article)

Table 3
Literature Review: Bond Ratings

Panel A: Determinants of Ratings

Author(s)	Dependent Variable(s)	Best Independent Variable(s)	Methodology
Horrigan (1966)	Numerical bond ratings Moody's and Standard & Poors	TA, Net Worth/TD, WC/Sales, Sales/NW, OI/Sales, and Subordination dummy	Regression Rsquare = 0.56
Pogue and Soldofsky (1969)	y1: prob of Aaa rather than Baa y2: prob of Aaa rather than Aa y3: prob of Aa rather than A y4: prob of A rather than Baa Moody's	6-yr averages of: D/V, NI/TA, CV of (NI/TA), NetTA, (NI+Int)/Int	Regression DV= 0-1
West (1970)	Numerical bond ratings Moody's	Logs of: (1) CV of earnings over past 9 years, (2) Length of time firm had operated w/o forcing creditors to take a loss, (3) MVE/D, (4) MV of firm's outstanding bonds	Regression Rsquare = 0.74
Pinches and Mingo (1973)	Bond ratings Moody's	Subordination dummy, Years of consecutive divs, Issue size, (NI+Int)/Int (5yr mean), D/TA (5yr mean), and NI/TA	MDA
Kaplan and Urwitz (1979)	Bond ratings Moody's	Subordination dummy, TA, D/TA, and beta	Probit and OLS
Ogden (1987)	Numerical bond ratings Standard & Poors	D/V, σ, and ln(V)	Probit Rsquare = 0.78 (D/V and σ)
Blume et al (1998)	Numerical bond ratings Standard & Poors	3-year averages of Pre-tax Interest Coverage, OI/Sales, D/TA, TD/TA, and Size (ln(MVE/CPI)) Also, market model beta and standard error	Probit

Panel B: Bond Ratings and Default

Author(s)	Key Findings
Hickman (1958)	Positive relation between initial quality ratings and default.
Altman (1989)	Mortality rates (1-10 years after issuance) very low for higher-rated bonds, increasing for lower-rated bonds.
Kao and Wu (1990)	Positive relation between quality ratings and bond yields.

Table 4

Standard and Poor's Long-Term Domestic Issuer Credit Ratings

Provides letter ratings corresponding with numerical credit ratings assigned by Standard & Poor's

Code	Rating
2	AAA
3	Unassigned
4	AA+
5	AA
6	AA-
7	A+
8	A
9	A-
10	BBB+
11	BBB
12	BBB-
13	BB+
14	BB
15	BB-
16	B+
17	B
18	B-
19	CCC+
20	CCC
21	CCC-
22	Unassigned
23	CC
24	C
25	Unassigned
26	CI
27	D
28	Not Meaningful
29	SD
90	Suspended

Table 5
Summary of OLS Regression Analyses using Various Combinations of Independent Variables

The dependent variable in each regression is the S&P numerical credit rating for 624 firms at year-end 1988. Size is measured as the natual logarithm of firm value (market value of equity plus book value of long-term debt), leverage as long-term debt divided by firm value, and the annualized standard deviation of assets (σ_A) is imputed from the annualized standard deviation of equity (σ_E) using Black-Scholes Option Pricing Model (BSOPM). B/Mnegor>1 is a dummy variable equal to one if B/M is less than zero or greater than one, and zero otherwise. HPR (86-88) is the three-year cumulative return over the period January 1986 - December 1988.

	Size (lnV)	Lev (D/V)	σ_A	B/Mnegor>1	HPR (86-88)	AdjRSquare
Coefficient	-1.208	15.216	18.360			
(t-stat)	-18.493	25.869	16.165			0.786
Coefficient	-1.202	15.013	18.308	0.262		
(t-stat)	-18.319	24.240	16.105	1.046		0.786
Coefficient	-1.230	15.031	18.012	0.286	0.169	
(t-stat)	-17.881	24.279	15.562	1.143	1.339	0.787
Coefficient	-1.235	15.251	18.087		0.158	
(t-stat)	-17.990	25.912	15.649		1.257	0.786
Coefficient	-1.736	8.320				
(t-stat)	-25.748	17.247				0.697
Coefficient	-2.134					
(t-stat)	-27.731					0.552
Coefficient		12.577				
(t-stat)		19.314				0.374
Coefficient			1.969			
(t-stat)			1.179			0.001
Coefficient				4.430		
(t-stat)				9.961		0.136
Coefficient					-1.648	
(t-stat)					-7.024	0.072
Coefficient				3.886	-1.186	
(t-stat)				8.673	-5.202	0.171
Coefficient			7.275	4.221	-1.396	
(t-stat)			4.663	9.451	-6.104	0.198
Coefficient	-1.798	8.778			0.528	
(t-stat)	-26.076	17.760			3.619	0.702
Coefficient	-1.723	8.013		0.438		
(t-stat)	-25.357	15.258		1.472		0.697
Coefficient	-1.785	8.435		0.509	0.544	
(t-stat)	-25.763	15.856		1.724	3.728	0.703

Table 6
Correlations and Regressions

Regressions of leverage (D/V) on business risk (σ_A, Panel A) and on firm size (ln(V), Panel B) and correlations among independent variables used to determine Financial Condition Score (FCS) (Panel C). Separate results are shown for all firms in the 1988, 1993, and 1998 samples.

	1988	1993	1998
Panel A			
N	3689	3910	4777
Adj R Square	0.27	0.12	0.22
Coeff. σ_A	-0.43	-0.17	-0.28
t-statistic	-36.83	-22.73	-36.47
Panel B			
N	3689	3910	4777
Adj R Square	0.02	0.02	0.02
Coeff. Size (ln(V))	0.01	0.01	0.01
t-statistic	8.41	7.81	8.73

Panel C

1988

	Size	Lev	σ_A
Size	1.00		
Lev	0.14	1.00	
σ_A	-0.44	-0.52	1.00
Standard Error	0.02		
1993			
Size	1.00		
Lev	0.12	1.00	
σ_A	-0.39	-0.34	1.00
Standard Error	0.02		
1998			
Size	1.00		
Lev	0.13	1.00	
σ_A	-0.35	-0.47	1.00
Standard Error	0.01		

Table 7

Intercepts and Coefficients Obtained from the Ordered Probit Model

The SAS ordered probit procedure yields k-1 intercept terms, where k is equal to the number of different credit ratings in a given sample year. Separate results are shown for all rated firms in the 1988 (Panel A), 1993 (Panel B), and 1998 (Panel C) samples.

Parameter	Estimate	S.E.	Chi-Square	p-value
Panel A: 1988 (RSquare = 0.7977)				
Intercept 27	-5.613	0.456	151.194	<.0001
Intercept 21	-5.535	0.453	149.306	<.0001
Intercept 20	-5.334	0.445	143.482	<.0001
Intercept 19	-4.858	0.432	126.219	<.0001
Intercept 18	-4.341	0.424	104.973	<.0001
Intercept 17	-3.691	0.415	79.087	<.0001
Intercept 16	-2.529	0.405	39.058	<.0001
Intercept 15	-2.022	0.404	25.064	<.0001
Intercept 14	-1.638	0.404	16.470	<.0001
Intercept 13	-1.219	0.403	9.163	0.0025
Intercept 12	-0.891	0.402	4.915	0.0266
Intercept 11	-0.367	0.399	0.843	0.3585
Intercept 10	-0.012	0.398	0.001	0.9752
Intercept 9	0.510	0.396	1.658	0.1979
Intercept 8	1.161	0.397	8.565	0.0034
Intercept 7	1.797	0.402	19.989	<.0001
Intercept 6	2.247	0.407	30.460	<.0001
Intercept 5	3.052	0.421	52.559	<.0001
Intercept 4	3.330	0.428	60.440	<.0001
Size	-0.598	0.036	273.439	<.0001
Lev	7.650	0.365	438.405	<.0001
σ_A	9.101	0.623	213.645	<.0001
Panel B: 1993 (RSquare = 0.7467)				
Intercept 27	-4.635	0.574	65.183	<.0001
Intercept 23	-4.344	0.525	68.387	<.0001
Intercept 21	-3.897	0.474	67.665	<.0001
Intercept 20	-3.709	0.455	66.490	<.0001
Intercept 19	-3.317	0.425	60.799	<.0001
Intercept 18	-2.445	0.382	40.897	<.0001
Intercept 17	-1.849	0.371	24.899	<.0001
Intercept 16	-0.885	0.361	5.991	0.0144
Intercept 15	-0.175	0.359	0.237	0.6261
Intercept 14	0.357	0.359	0.986	0.3208
Intercept 13	0.751	0.360	4.349	0.037
Intercept 12	1.100	0.360	9.333	0.0023
Intercept 11	1.675	0.360	21.627	<.0001
Intercept 10	2.084	0.362	33.223	<.0001
Intercept 9	2.496	0.365	46.909	<.0001
Intercept 8	3.129	0.371	71.113	<.0001
Intercept 7	3.623	0.376	92.645	<.0001
Intercept 6	4.095	0.385	113.344	<.0001
Intercept 5	4.727	0.402	138.549	<.0001
Intercept 4	5.031	0.413	148.727	<.0001
Size	-0.563	0.038	224.164	<.0001
Lev	5.310	0.285	346.779	<.0001
σ_A	6.079	0.419	210.326	<.0001

Table 7 (cont'd)

Parameter	Estimate	S.E.	Chi-Square	p-value
Panel C: 1998 (Rsquare = 0.7436)				
Intercept 23	-5.541	0.512	117.018	<.0001
Intercept 20	-4.857	0.401	146.956	<.0001
Intercept 19	-4.441	0.377	138.623	<.0001
Intercept 18	-3.879	0.361	115.462	<.0001
Intercept 17	-3.137	0.350	80.543	<.0001
Intercept 16	-2.107	0.341	38.247	<.0001
Intercept 15	-1.346	0.338	15.827	<.0001
Intercept 14	-0.874	0.338	6.695	0.0097
Intercept 13	-0.495	0.337	2.156	0.1421
Intercept 12	-0.022	0.336	0.004	0.9486
Intercept 11	0.507	0.335	2.286	0.1306
Intercept 10	1.079	0.337	10.255	0.0014
Intercept 9	1.527	0.339	20.283	<.0001
Intercept 8	2.302	0.346	44.365	<.0001
Intercept 7	2.847	0.353	65.001	<.0001
Intercept 6	3.385	0.366	85.530	<.0001
Intercept 5	3.952	0.384	105.680	<.0001
Intercept 4	4.372	0.412	112.877	<.0001
Size	-0.442	0.031	202.675	<.0001
Lev	5.735	0.263	475.643	<.0001
σ_A	6.799	0.367	344.144	<.0001

Table 8

Descriptive Statistics for Sample Firms

Statistics for independent variables (i.e., size, leverage, and σ_A) and FCS are separately provided for rated firms, unrated firms, and all sample firms in 1988 (Panel A), 1993 (Panel B), and 1998 (Panel C). Descriptive statistics for the dependent variable (i.e., S&P credit rating (SP)) are provided for rated firms.

	Rated Firms					Unrated Firms				Full Sample			
	Size	Lev	σ_A	FCS	SP	Size	Lev	σ_A	FCS	Size	Lev	σ_A	FCS
Panel A: 1988													
Mean	6.8	0.352	0.261	11.9	11.9	3.5	0.192	0.478	16.9	4.1	0.219	0.441	16.1
Standard Error	0.1	0.009	0.004	0.2	0.2	0.0	0.004	0.005	0.1	0.0	0.004	0.004	0.1
Median	6.8	0.306	0.249	11.5	12.0	3.5	0.110	0.419	16.2	3.9	0.150	0.377	15.9
Standard Deviation	1.6	0.224	0.110	4.1	4.6	1.7	0.216	0.281	4.8	2.1	0.226	0.273	5.0
Sample Variance	2.6	0.050	0.012	17.0	21.2	3.0	0.047	0.079	22.7	4.5	0.051	0.074	25.3
Minimum	2.1	0.000	0.000	2.7	2.0	-2.2	0.000	0.016	3.5	-2.2	0.000	0.000	2.7
Maximum	11.3	1.000	0.927	22.8	27.0	9.8	0.970	3.752	48.4	11.3	1.000	3.752	48.4
N	624	624	624	624	624	3065	3065	3065	3065	3689	3689	3689	3689
Panel B: 1993													
Mean	7.4	0.296	0.248	11.4	11.5	4.2	0.137	0.524	16.4	4.7	0.163	0.479	15.6
Standard Error	0.1	0.008	0.005	0.1	0.2	0.0	0.003	0.007	0.1	0.0	0.003	0.006	0.1
Median	7.5	0.266	0.216	10.9	11.0	4.2	0.052	0.450	16.0	4.5	0.083	0.404	15.7
Standard Deviation	1.5	0.207	0.128	3.5	3.9	1.6	0.185	0.408	4.3	2.0	0.198	0.390	4.7
Sample Variance	2.1	0.043	0.016	12.6	15.5	2.6	0.034	0.166	18.1	3.9	0.039	0.152	22.5
Minimum	3.3	0.000	0.052	3.5	2.0	-1.1	0.000	0.020	5.3	-1.1	0.000	0.020	3.5
Maximum	11.7	0.907	1.091	24.5	27.0	9.6	0.972	13.911	45.8	11.7	0.972	13.911	101.9
N	640	640	640	640	640	3268	3268	3268	3268	3908	3908	3908	3908
Panel C: 1998													
Mean	7.6	0.363	0.263	12.5	12.4	4.5	0.153	0.568	16.7	5.1	0.193	0.509	15.9
Standard Error	0.1	0.008	0.004	0.1	0.1	0.0	0.003	0.007	0.1	0.0	0.003	0.006	0.1
Median	7.4	0.326	0.237	12.4	13.0	4.5	0.046	0.502	16.3	5.0	0.094	0.434	16.0
Standard Deviation	1.6	0.245	0.134	3.5	3.6	1.7	0.209	0.409	4.4	2.1	0.231	0.391	4.6
Sample Variance	2.5	0.060	0.018	12.4	12.7	2.9	0.044	0.167	19.4	4.3	0.054	0.153	20.7
Minimum	3.4	0.000	0.009	3.2	2.0	-0.2	0.000	0.026	5.2	-0.2	0.000	0.009	3.2
Maximum	12.9	0.983	1.281	21.3	23.0	11.5	0.971	8.412	73.0	12.9	0.983	8.412	73.0
N	917	917	917	917	917	3860	3860	3860	3860	4777	4777	4777	4777

Table 9
Descriptions and Relative Frequencies of CRSP variable 'Delist Code:' Jan. 1989 - Dec. 1991

Data are from the CRSP monthly stock file. Delist codes shown are for all non-financial, non-utility firms that delisted during the period January 1989 to December 1991. Descriptions are for selected categories with the highest frequencies.

Category	DLSTCD	Freq.	%	Cum. Freq.	Cum. %
Merger, Details unknown	200	12	0.94	12	0.94
Merger, Common Stock	231	120	9.45	132	10.39
	232	1	0.08	133	10.47
Merger, Cash	233	274	21.57	407	32.05
	234	2	0.16	409	32.20
	235	1	0.08	410	32.28
Merger, Common Stock and Cash	241	20	1.57	430	33.86
	242	11	0.87	441	34.72
	251	1	0.08	442	34.80
Merger, Cash and P.S., warrants, rights, or deb	261	15	1.18	457	35.98
	262	2	0.16	459	36.14
	331	1	0.08	460	36.22
	341	2	0.16	462	36.38
	342	1	0.08	463	36.46
	400	1	0.08	464	36.54
	450	9	0.71	473	37.24
	460	4	0.31	477	37.56
	490	1	0.08	478	37.64
	510	2	0.16	480	37.80
	516	1	0.08	481	37.87
	517	1	0.08	482	37.95
	520	5	0.39	487	38.35
Insufficient number of market makers	550	115	9.06	602	47.40
Insufficient number of shareholders	551	19	1.50	621	48.90
Insufficient capital, surplus, equity	560	298	23.46	919	72.36
Insufficient float/assets	561	15	1.18	934	73.54
Company request (no reason given)	570	24	1.89	958	75.43
Deregistration (gone private)	573	2	0.16	960	75.59
Bankruptcy	574	68	5.35	1028	80.94
	575	3	0.24	1031	81.18
Delinquent in filing	580	199	15.67	1230	96.85
Failure to register under 12G of Sec. Exchange Act	581	26	2.05	1256	98.90
	582	2	0.16	1258	99.06
Does not meet exch. fin. guidelines for cont'd listing	584	12	0.94	1270	100.00

General Category	Freq.	%
Merger	463	36.46
Performance	807	63.54
Total	1270	100

Table 10

3-Year Delisting Outcome by FCS Quintile

Outcomes are shown separately for each sample year. Quintile 1 (5) contains firms with the highest (lowest) FCS. Financials, utilities, and foreign firms are omitted. Panel A shows results for 3,689 firms sorted at year-end 1988. Quintiles 1,2,4,& 5 each contain 738 firms, Quintile 3 contains 737 firms. Panel B shows results for 3,907 firms sorted at year-end 1993. Quintiles 1 and 5 each contain 782 firms, Quintiles 2,3,& 4 each contain 781 firms. Panel C shows results for 4,775 firms sorted at year-end 1998. Each Quintile contains 955 firms. Delist data is from the CRSP monthly stock file over the 3-year period Jan. 1989 - Dec. 1991. Merger delists includes delist codes 200-399 (Mergers and Exchanges). Performance delists include delist codes 400+ (Liquidations and Dropped by Exchange).

	Q1	Q2	Q3	Q4	Q5	Total (t+1 to t+3)
Panel A: 1988						
Total	309	169	122	108	56	764
Merger	47	57	85	86	54	329
Performance	262	112	37	22	2	435
% of Total Delists (t+1 to t+3) by Quintile						
Total	40.4	22.1	16.0	14.1	7.3	100.0
Merger	14.3	17.3	25.8	26.1	16.4	100.0
Performance	60.2	25.7	8.5	5.1	0.5	100.0
% of Firms Delisted by Quintile						
Total	41.9	22.9	16.6	14.6	7.6	
Merger	6.4	7.7	11.5	11.7	7.3	
Performance	35.5	15.2	5.0	3.0	0.3	
Panel B: 1993						
Total	230	155	155	110	59	709
Merger	62	88	121	102	58	431
Performance	168	67	34	8	1	278
% of Total Delists (t+1 to t+3) by Quintile						
Total	32.4	21.9	21.9	15.5	8.3	100.0
Merger	14.4	20.4	28.1	23.7	13.5	100.0
Performance	60.4	24.1	12.2	2.9	0.4	100.0
% of Firms Delisted by Quintile						
Total	29.4	19.8	19.8	14.1	7.5	
Merger	7.9	11.3	15.5	13.1	7.4	
Performance	21.5	8.6	4.4	1.0	0.1	
Panel C: 1998						
Total	443	369	324	242	181	1559
Merger	110	161	211	203	167	852
Performance	333	208	113	39	14	707
% of Total Delists (t+1 to t+3) by Quintile						
Total	28.4	23.7	20.8	15.5	11.6	100.0
Merger	12.9	18.9	24.8	23.8	19.6	100.0
Performance	47.1	29.4	16.0	5.5	2.0	100.0
% of Firms Delisted by Quintile						
Total	46.4	38.6	33.9	25.3	19.0	
Merger	11.5	16.9	22.1	21.3	17.5	
Performance	34.9	21.8	11.8	4.1	1.5	

Table 11

3-Year Delisting Outcome by HPR Quintile

Sample includes 3,689 NYSE, AMEX, and Nasdaq stocks sorted at year-end 1988 by previous 3-year holding period returns (HPR) (i.e., Jan. 1986 - Dec. 1988). Financials, utilities, and foreign firms are omitted. Returns data is from the CRSP monthly stock file. Quintile 1 (5) contains firms with the lowest (highest) 3-year HPR. Quintiles 1,2,4,& 5 each contain 738 firms, Quintile 3 contains 737 firms. Delist data is from the CRSP monthly stock file over the 3-year period Jan. 1989 - Dec. 1991. Merger delists includes delist codes 200-399 (Mergers and Exchanges). Performance delists include delist codes 400+ (Liquidations and Dropped by Exchange).

	Q1	Q2	Q3	Q4	Q5	Total (t+1 to t+3)
Total	277	161	129	98	99	764
Merger	52	63	77	72	65	329
Performance	225	98	52	26	34	435
% of Total Delists (t+1 to t+3) by Quintile						
Total	36.3	21.1	16.9	12.8	13.0	100.0
Merger	15.8	19.1	23.4	21.9	19.8	100.0
Performance	51.7	22.5	12.0	6.0	7.8	100.0
% of Firms Delisted by Quintile						
Total	37.5	21.8	17.5	13.3	13.4	
Merger	7.0	8.5	10.4	9.8	8.8	
Performance	30.5	13.3	7.1	3.5	4.6	

Table 12

3-Year Delisting Outcome by S&P Credit Rating Quintile

Sample includes 624 NYSE, AMEX, and Nasdaq stocks with S&P Credit Ratings at year-end 1988. Financials, utilities, and foreign firms omitted. Quintiles 1,2,4, and 5 each contain 125 firms, Quintile 3 contains 124 firms. Delist data is from the CRSP monthly stock file over the 3-year period Jan. 1989 - Dec. 1991. Merger delists includes delist codes 200-399 (Mergers and Exchanges). Performance delists include delist codes 400+ (Liquidations and Dropped by Exchange).

	Q1	Q2	Q3	Q4	Q5	Total (t+1 to t+3)
Total	24	18	8	9	3	62
Merger	15	13	8	9	3	48
Performance	9	5	0	0	0	14
% of Total Delists (t+1 to t+3) by Quintile						
Total	38.7	29.0	12.9	14.5	4.8	100.0
Merger	31.3	27.1	16.7	18.8	6.3	100.0
Performance	64.3	35.7	0.0	0.0	0.0	100.0
% of Firms Delisted by Quintile						
Total	19.2	14.4	6.5	7.2	2.4	
Merger	12.0	10.4	6.5	7.2	2.4	
Performance	7.2	4.0	0.0	0.0	0.0	

Part II: The Dynamics of Financial Distress

1. Introduction

In response to financial distress, a firm might make changes in its operations, including employee layoffs, reductions in investment, and/or asset sales. To maintain operations and alleviate difficulties in meeting contractual debt obligations, a distressed firm might conduct a private workout or a public debt restructuring to modify the terms of its debt. Several empirical papers document evidence of one or more of such distress responses.

A relatively unexplored area of research in the distress literature is the cash flows of distressed firms and the relation between these cash flows and firm failure. In Part II I examine year t+1 cash flow data for distressed firms, especially their net cash flows from operations, investment, and (external) financing, and the relation between these cash flows (in isolation and in tandem) and failure rates as of year-end t+3. For example, a distressed firm in need of funds might obtain external finance by issuing new debt or equity. Are firms that issue debt more or less likely to fail than firms that issue equity? Part II provides empirical evidence that addresses this question and several others.

Previous studies of financial distress generally focus on firms that declare bankruptcy, i.e., file under Chapter 11 or Chapter 7 of the U.S. Bankruptcy Code. However bankruptcy is a rare event and represents only one of many potential negative outcomes of distress. Studies that confine the outcome of distress to bankruptcy are unnecessarily restrictive and therefore incomplete. In a recent study of the survival of newly listed stocks, Fama and French define 'performance delists' to include CRSP delist codes 400 and higher, and this study adopts their broader view.

My study contributes to the existing literature on financial distress by (1) providing a comprehensive analysis of distress dynamics through examination of a large sample of firms, (2) using relatively recent data, (3) focusing on cash flows, and (4) utilizing a broader definition of firm failure.

The remainder of Part II is organized as follows: Section 2 reviews the related literature, Section 3 describes the research methodology and hypotheses, Section 4 presents results, and Section 5 concludes.

2. Literature Review

A. Modern Corporate Finance Theory: Capital Structure

Information asymmetry issues, present to some degree in all publicly-traded firms, worsen under distress conditions. Myers and Majluf's (1984) *Pecking Order Hypothesis* posits that managers prefer internal financing (i.e., retained earnings, built up by operating profits) to external financing (i.e., issuance of debt or equity), and that if internal financing is unavailable, the issuance of debt is preferred to equity. Both debt and equity issuances are more costly than internally generated funds because management and potential investors, by virtue of management's informational advantage, differ in their valuation of external securities. The difference in valuation is less severe for debt because the promised payments on debt are fixed at issuance, so the surrender of value to new external investors is smaller. Thus, a firm will issue equity only as a last resort, i.e., when it has exhausted its debt capacity.

According to the *Traditional Tradeoff Theory* of capital structure, a firm increases its leverage until the marginal tax benefit of debt just offsets the marginal expected costs

of financial distress. For a given firm there is a unique optimal amount of leverage. Thus, leverage is mean-reverting over time.

Recent studies empirically test the aforementioned capital structure theories. For a sample of 157 firms, Shyam-Sunder and Myers (1999) find that the financing deficit is matched by the change in corporate debt, which supports the Pecking Order Hypothesis. Frank and Goyal (2003), however, show that "contrary to the pecking order theory, net equity issues track the financing deficit more closely than do net debt issues" (p. 217). In a recent working paper, Fama and French (2004) provide additional evidence against the Pecking Order Hypothesis. Specifically, they show that most firms issue or retire equity each year. More pertinent to this study, they also find that "equity issuers are not typically under duress," as the Pecking Order Hypothesis predicts (p. 2).

Both the Pecking Order Hypothesis and the Traditional Tradeoff Theory can be applied to formulate expectations regarding the financing decisions of distressed firms. Some distressed firms may have high leverage; they are unlikely to be able to pay down debt while the market value of equity has been eroded by poor performance. Distressed firms might also have had recent operating losses that have drawn down retained earnings. In need of financing, the Pecking Order Hypothesis suggests that such firms will issue debt. However, for some of these firms the debt market may already be closed. Under these circumstances, equity will be issued by only the most severely distressed firms. On the other hand, the Traditional Tradeoff Theory predicts that distressed firms will take actions to *lower* leverage, because any increase in leverage would further increase both the probability and associated costs of future financial distress. These issues will be further discussed in the development of testable hypotheses (Section 3).

B. Empirical Research on Financial Distress

John, Lang, and Netter (1992) (JLN) examine the actions taken by 46 large firms in response to distress as measured by negative earnings. They document changes in several variables including assets, employment, number of business segments, investment, research and development, advertising, dividends, and share repurchases. On average, distressed firms reduce the number of business segments, increase investment, and cut research and development and advertising expenses in the first year after negative earnings. In addition, distressed firms increase total assets in each of the three years following negative earnings.

Although JLN examine changes in leverage, they do not explicitly consider issuances of debt and/or equity. They also restrict their analysis to firms that are not subject to a successful takeover, bankruptcy, or liquidation. Moreover, they focus only on responses to negative earnings, which are not necessarily indicative of distress.

Asquith, Gertner, and Scharfstein (1994) (AGS) investigate the role of debt restructurings, asset sales, mergers, and capital expenditure reductions in the resolution of financial distress. The authors document frequent asset sales and find that the proportion of total assets sold is related to the outcome of distress; "only 3 out of 18 companies that sell over 20% of their assets go bankrupt, while 39 out of the 58 that sell less than 20% of their assets go bankrupt" (p. 626). Over 80% of distressed firms in their sample cut capital expenditures from the year preceding the onset of distress to the year after.

A main objective of the paper, according to AGS, is "to put these elements together in a more comprehensive study of how firms respond to financial distress"

(p. 625). However, like JLN, they employ a small sample; they study 102 firms that issued junk-bonds in the 1970s and 1980s and subsequently became financially distressed. In addition, their measurement of financial distress is simply based on interest coverage ratios. As a result of the sample and distress measure employed, the generalizability of their findings is uncertain.

In general, prior researchers on firm responses to financial distress deliberately utilize a small number of firms in an attempt to provide an in-depth analysis. I take the opposite approach. To maximize the value of new results, I opt to measure distress for the largest population of firms by using only three widely-available variables. In doing so, I provide a truly comprehensive empirical analysis of financial distress among U.S. publicly-traded non-financial corporations.

A thorough review of the literature reveals numerous specific responses to financial distress. Individual responses can generally be categorized by whether they involve the restructuring of assets, equity, and/or liabilities, though distressed firms frequently undertake several responses simultaneously. It should be noted that FCS could be used to assess the external validity of the results of many previous studies. However, in Part II I supplement the literature on decisions made in distress by focusing on the cash flows of distressed firms and the relation between these cash flows and failure rates.

Several papers are at least tangentially related to the external financing decisions of distressed firms. Owing to the general focus on the declaration or avoidance of bankruptcy, many of these examine public and/or private debt restructurings. Next I summarize three studies that are most germane to this study.

Jensen and Johnson (JJ) (1995), in a study of firms that reduce dividends, find that new equity financing by dividend-cutting firms decreases significantly beginning three years prior to the dividend cut announcement and is approximately zero for the subsequent three years. To the extent that a dividend cut announcement is a crude proxy for distress, their evidence suggests that distressed firms do not issue new equity. According to the authors, "it would appear that the firm's deteriorating financial condition, earnings performance, and stock price make the equity market an increasingly unattractive alternative for raising funds" (p. 42). However, some dividend-cutting firms might not have been distressed, and sample firms generally experienced increased earnings after the cut, potentially obviating the need for new external financing.

JJ also find that changes in the issuance of long-term debt by dividend-cutting firms are insignificant in the three-year period preceding the dividend cut announcement. However, in the period following the dividend cut there is an extraordinary decline in new debt financing. Again, they focus only on firms that announce a dividend reduction, and these firms may or may not be distressed. JLN, in the earlier-cited study, find that the average firm in their sample reduces debt/asset levels in the first year after negative earnings, which complements the results presented by JJ that distressed firms do not issue new debt. In contrast, I find that distressed firms often increase debt.

Other empirical work also suggests that distressed firms are relatively unlikely to issue new debt. Lie, Lie, and McConnell (2001) examine the motivation for, and information conveyed by, debt-reducing exchange offers. Their results indicate that "debt-reducing exchange offers are undertaken by financially weak firms in an effort to stave off further financial distress and, thereby, preserve value for shareholders" (p. 179).

In addition, "a successfully completed exchange offer significantly reduces the likelihood that a firm will enter Chapter 11" (p. 179).

Finally, I am aware of only one paper in the extant literature that addresses the relation between operating performance during distress and firm failure. Surprisingly, AGS find that better performing firms (i.e., firms with higher operating income, lower book-to-market, and high cash flow coverage ratio) "are as likely to go bankrupt... as other firms" (p. 627). In Section 5, I provide empirical evidence that contradicts this result.

3. Data, Methodology, and Hypotheses

A. Data and Methodology

I develop the dataset for the analyses in Part II as follows. For each year t (t =1988, 1993, and 1998) I sort all (non-financial, non-utility) NYSE, AMEX, and Nasdaq firms into quintiles based on FCS as developed in Part I. I identify the most distressed firms as those in quintile 1, i.e., those with the highest FCS.

I first calculate FCS for year-end t sample firms in each year t+1 through t+3 to document improvement or deterioration in FCS among firms that survive through year-end t+3. The ordered probit model is separately estimated for samples of rated firms in years t+I, t+2, and t+3. The reason for this annual update is twofold. First, average firm size has increased during the sample period. Second, Blume et al. (1998) present evidence that credit rating standards have become more stringent over time. The use of yearly intercepts and coefficients controls for changes in average firm size and agency bond rating standards during the sample period.

The intercepts and coefficients obtained from the probit analyses in years t+1 through t+3 are then applied to the corresponding year's set of independent variables for year-end t sample firms. If a firm delists in year t+i, its FCS_{t+i} is considered missing.

Then I collect data for quintile 1 firms from the Compustat Industrial Annual File in year t+1. All variables in year t+1 are scaled by Total Assets (data6) at year-end t. I examine the following categories of variables found on Compustat:

1. Cash Flows: Net Cash Flow from Operating Activities (NCFO, data308), Net Cash flow from Investing Activities (NCFI, data311), Net Cash Flow from Financing Activities (NCFF, data313), and Other Financing Activities (data312).

To determine the source of external finance (e.g., debt versus equity), I also examine:

2. Equity Financing: Sale of Common and Preferred Stock (data108).
3. Debt Financing: Long-term Debt Issuance (data111), Long-term Debt Retirement (data114), and Change in Current Debt (data301).

Finally, the CRSP variable 'delist code,' obtained in Part I for quintile 1 firms through year-end t+3, is used to determine the outcome of a firm taking a given action (e.g., issuing debt) or exhibiting a certain level of operating performance (e.g., negative NCFO).

I use the stated variables to perform several analyses. In each of the analyses that follow, the percent of firms acquired or delisted for performance by year-end t+3 is calculated for each category and/or sub-category, and 'failure' refers to delists for performance.

To examine the relation between external finance and three-year outcome, I sort distressed firms into five categories by year t+1 ratio of NCFF to Total Assets: (1) NCFF Missing, (2) NCFF/TA<0, (3) NCFF/TA=0, (4) NCFF/TA<10%, and (5) NCFF/TA>10%. Firms for which NCFF is missing in year t+1 are generally those firms that delist quickly, i.e., early in year t+1.

To address the relation among source of external funds, use of external funds, and three-year outcome for distressed firms with heavy external financing, I first identify distressed firms for which NCFF/TA exceeds 10%. These firms are sorted into categories according to the predominant source of external financing (i.e., debt, equity, or other financing activity) and then cross-sorted into sub-categories according to the predominant use of funds (i.e., to cover an operating loss or for investment).

The relation between internal funds flow (i.e., operating performance) and three-year outcome is investigated as follows. Distressed firms are sorted into four categories based on year t+1 ratio of NCFO to Total Assets: (1) NCFO/TA>10%, (2) $0 \leq$NCFO/TA$\leq$10%, (3) -10%$\leq$NCFO/TA<0, and (4) NCFO/TA<-10%.

To study the relation among internal funds flow, external financing, and three-year outcome, distressed firms are sorted into two categories by year t+1 NCFO status: (1) NCFO<0 and (2) NCFO$\geq$0. Sample firms are then cross-sorted into sub-categories according to the predominant source of external finance, if any.

The remaining three analyses distinguish the distress responses of levered firms from all-equity firms. First, distressed firms are sorted into two categories by year-end t leverage: (1) All-equity firms, and (2) Levered firms.

To address the relation between external financing and three-year outcome for all-equity firms versus levered firms, firms in each category are cross-sorted into sub-categories by year t+1 ratio of NCFF to Total Assets.

Finally, the relations among source of funds, use of funds, and three-year outcome among distressed firms with heavy external financing are separately examined for all-equity and levered firms. Distressed all-equity (levered) firms for which NCFF/TA exceeds 10% are identified and sorted into categories according to the predominant source of external financing (i.e., debt, equity, or other fin. act.). Firms are then cross-sorted into sub-categories according to the predominant use of funds (i.e., to cover an operating loss or for investment).

B. Hypotheses

In this section, I discuss hypotheses associated with each of the data sorts noted in the previous subsection. The hypotheses can be sorted into two broad categories: (1) hypotheses regarding the relative frequencies of financing actions taken by the managements of distressed firms, and (2) hypotheses regarding the relative success of each type of action, measured in terms of the three-year outcomes of firms that take a given action. The selected hypotheses follow.

B. 1. Issuance of Debt and/or Equity

A distressed firm may seek to secure additional debt or equity financing to cover an operating loss or for investment purposes. To the extent that poor performance is attributable to high interest payments, instead, a distressed firm might find a way to pay

down existing debt or retire outstanding debt via a workout. On the other hand, a distressed firm's financial condition might also make the issuance of new equity problematic. The Pecking Order Hypothesis and the Traditional Tradeoff Theory both suggest hypotheses regarding the financing decisions of distressed firms.

Distressed firms are those for whom information asymmetry problems are most severe. According to the Pecking Order Hypothesis, such firms will generally seek to avoid issuing external finance. However, if they must raise funds externally, they will issue equity only as a last resort. Thus, the Pecking Order Hypothesis suggests the following two hypotheses:

Hypothesis 1: Distressed firms will issue equity only as a last resort, i.e., only when debt capacity has been exhausted.

And if equity is, in fact, a last resort financing alternative then

Hypothesis 2: Distressed firms that issue equity are more likely (than those that issue debt) to fail.

Other lines of reasoning suggest that distressed firms will issue equity more frequently than predicted by the Pecking Order Hypothesis. First, a workout often entails the exchange of equity for debt such that residual claims are substituted for fixed claims (James (1995), et al.). Second, the two purported benefits of debt in the Traditional Tradeoff Theory are the tax deductibility of interest and the reduction of free cash flow agency conflicts. For distressed firms the expected costs of future distress appear to overwhelm these benefits at the margin. Thus,

Hypothesis 3: Distressed firms in need of external finance issue new common or preferred stock before issuing new debt.

B. 2. Use of Financing Proceeds

Irrespective of the type of external finance obtained, what a distressed firm does with the proceeds might be significantly related to its probability of failure. It is reasonable to theorize that a firm that obtains outside financing to cover an operating loss is more likely to fail than a firm that uses the proceeds primarily for investment. Intuitively, a firm that primarily covers an operating loss might only be delaying inevitable failure, while a firm that primarily invests its financing proceeds may have better prospects. Thus,

Hypothesis 4: Distressed firms that use proceeds from external financing activities to cover an operating loss are more likely to fail than firms that invest proceeds.

B. 3. Operating Performance

Distressed firms may have experienced recent decreases in NFCO, and NCFO might continue to be negative during distress. The sign and magnitude of NCFO in year t+1 may have a significant effect on the probability of failure. Asquith, Gertner, and Scharfstein (1994) find that better performing firms (i.e., firms with higher operating income, lower book-to-market, and high cash flow coverage ratio) "are as likely to go bankrupt... as other firms" (p. 627). To test this for our larger sample,

Hypothesis 5: Distressed firms with higher NCFO are less likely to fail.

B. 4. Differences between All-Equity Firms and Levered Firms

Prior research suggests that the distress responses and outcomes of all-equity firms might differ from those of levered firms. According to Wruck (1990), "financial distress frees resources to move to higher-valued uses by forcing managers and directors to reduce capacity and to rethink operating policies and strategy decision. This kind of organizational change is unlikely to occur in an all-equity firm, because without leverage, poor performance does not lead to financial distress. It is financial distress that gives creditors a legal right to demand restructuring" (p. 420-1).

Gilson (1989) provides some empirical evidence that supports this idea. He finds that top management turnover following the onset of financial distress is often initiated by lenders. If Wruck's assertion has merit, then we should observe significant differences in distress responses, and eventual outcome, between levered and unlevered firms. If necessary organizational and strategic changes are generally initiated by lenders and do not occur in the absence of creditors, then the following is a reasonable hypothesis:

Hypothesis 6: Distressed all-equity firms are more likely to fail than distressed levered firms.

4. Results

Table 1 shows the distribution of FCS in years t+i (i=1 to 3) for firms surviving through year t+i. FCS is computed only for surviving firms because firms that delist will lack data on one or all of the FCS input variables (i.e., size, leverage, and σ_A).

First, note that FCS of quintile 1 firms at year-end t (t=1988, 1993, and 1998) ranges from 22.13 to 23.29. In terms of Standard and Poor's letter ratings, 21 (23) is

equivalent to a rating of CCC- (CC). FCS among all firms ranges from 15.86 to 16.08, where 15 (16) is equivalent BB- (B+).

The evidence presented in Table 1 indicates a general improvement in financial condition among distressed firms that survive through year t+3. Presumably firms with higher scores (i.e., worse financial conditions) delist, leaving firms with relatively lower scores. Due to the survivorship bias inherent in Table 1, however, it is difficult to draw other meaningful conclusions.

Tables 2-8 present empirical evidence of the relations among the cash flows and failure rates of distressed (i.e., quintile 1) firms. Results are shown individually for years 1988, 1993, and 1998 (Panels A, B, and C, respectively), and combinations of those years (Panels D and E). Sample years 1988 and 1998 both precede recession periods while the general economic conditions of 1994 were expansionary.

Table 2 shows the availability of external finance in year t+1 and its relation with the three-year outcome. A large number of sample firms (e.g., 32.4% in 1988) have negative NCFF; many firms find a way to pay down debt in the year following the measurement of distress. However, in each sample year at least 30% of distressed firms receive large amounts of external finance (i.e., NCFF/TA>10%).

Interestingly, firms that receive large amounts of external finance fail (i.e., delist for performance) more often than firms that receive small amounts (i.e., NCFF/TA<10%). This result is statistically significant for the 1988 and 1998 pooled sample (Panel D) as well as for the 1988, 1993, and 1998 pooled sample (Panel E). One explanation for this result is that the firms that receive large amounts of external finance are the firms that are the most distressed and therefore most in need of large-scale financing. There is some

evidence consistent with this explanation; FCS for firms securing substantial external finance is generally higher than FCS for firms in other financing categories. This finding motivates a closer inspection of those firms that receive large amounts of external finance.

Table 3 presents evidence of the relation among the source of external finance, the use of the proceeds, and three-year outcome among firms with heavy external finance. The evidence presented here tests Hypotheses 2 and 4 by providing answers to the following questions: (1) Are distressed firms that issue debt more or less likely to fail than distressed firms that issue equity? and (2) Is there a relation between the use of the financing proceeds and the outcome?

First, for the 1988 and 1998 samples distressed firms that issue debt are more likely to fail than distressed firms that issue equity. This result is statistically significant at the 10% level for the 1988 and 1998 pooled sample (Panel D), providing evidence inconsistent with Hypothesis 2. However, there is little difference between failure rates of debt and equity issuers for the 1993 sample. One explanation is that distressed firms that issue debt are taking a gamble on the future state of the economy: If the economy deteriorates into recession and a firm has issued debt, the fixed payments associated with debt increase the probability of failure. On the other hand if the economy does not deteriorate or expands, issuing debt instead of equity will not significantly increase the likelihood of failure. Macro-level factors appear to have a major effect on failure rates.

Consistent with Hypothesis 4, firms that use the proceeds of external finance primarily to cover an operating loss are significantly more likely to fail than firms that use the funds mostly for investment, *irrespective of the type of external finance obtained* (e.g., debt versus equity). This result is highly statistically and economically significant

and holds for the pooled samples as well as for each individual sample year. For the 1998 sample for example, 44.7% of firms that issued equity to cover an operating loss failed compared to only 19.6% of firms that issued equity for investment. This suggests an additional explanation for the Table 2 result that firms receiving large amounts of external finance are more likely to fail: many of the firms that receive significant external finance use the proceeds to cover an operating loss.

Finally, in each sample year the following hierarchy emerges: Firms that issue debt to cover an operating loss are the most likely to fail, followed by firms that issue equity to cover an operating loss, then by firms that issue debt for investment purposes, and lastly by firms that issue equity for investment. These results indicate that both the source and use of funds play a critical role in failure rates of distressed firms, though the use of funds appears to be first-order.

Table 4 investigates the relation between operating performance (i.e., Net Cash Flow from Operating Activities (NCFO)) and outcome. Asquith, Gertner, and Scharfstein (1994), in a small-sample study of distressed junk-bond issuers, find no significant relation between operating performance and failure. In contrast, Table 4 shows a strong relation between operating performance and three-year outcome, consistent with Hypothesis 5. Specifically, there is a strong monotonic inverse relation between NCFO/TA and failure rates in each sample period. Distressed firms with negative NCFO are significantly more likely to fail than distressed firms with positive or zero NCFO, and firms with large profits (i.e., NCFO/TA>10%) are significantly less likely to fail than firms with large losses (i.e., NCFO/TA<-10%). Finally, there is no evidence that the size of the loss matters; there is no significant difference in failure rates

between firms with large losses compared to those with small losses. Since Table 4 does not include data for firms that delisted in year t+1, these results suggest that an examination of a distressed firm's financial statements in the year following distress measurement can offer insight into the probability of short-term failure.

Table 5 further documents a negative relation between operating performance in distress and incidence of failure; in each sample year, firms with negative NCFO are approximately twice as likely to delist for performance as firms with positive or zero NCFO. Table 5 is sub-divided into sources of external finance for firms with negative versus positive or zero NCFO. Not surprisingly, a substantial proportion (e.g., 62% of the 1988 sample) of firms with positive or zero NCFO have either negative or zero NCFF; firms with positive operating cash flow are less in need of external finance. Among those that do obtain external funds, debt is issued more often than equity in each sample year.

In contrast, a relatively small percentage of firms (e.g., 22% of the 1988 sample) with negative NCFO have either negative or zero NCFF; firms with negative NCFO often need external financing to maintain operations. With the exception of 1988, distressed firms with negative NCFO are more likely to issue equity than debt.

Evidence presented in Table 3 suggested that debt issuers are more likely to fail than equity issuers. Table 5 assesses whether a firm's operating performance (i.e., negative versus positive NCFO) affects this result. For each sample year debt issuers are more likely to fail than equity issuers *irrespective of operating performance*, and this result is statistically significant for both pooled samples (Panels D and E).

The remaining three tables distinguish the distress responses and outcomes of all-equity firms from levered firms, where leverage is measured at year-end t. The

proportion of sample firms with no long-term debt outstanding increases from 20% in 1988 to 24% in 1993 and 30% in 1998. This is consistent with evidence presented by Fama and French (1998) on the changing nature of publicly-traded firms. They find an increasing incidence of small, low profitability, high-growth firms, and these are generally the types of firms that would be expected to have little or no leverage. Table 6 supports this view; compared to levered firms, all-equity firms tend to be smaller and have higher business risk (σ_A). Such firms might choose to remain unlevered because they are relatively smaller and riskier.

Because all-equity firms tend to be smaller and riskier than levered firms, they might be expected to have higher failure rates. Further, Wruck (1990) asserts that needed organizational changes are unlikely to occur in all-equity firms, "because without leverage, poor performance does not lead to financial distress" (p. 421).

Results presented in Table 6 do not support Hypothesis 6: there are no significant differences in the proportions of all-equity and levered firms that delist for performance. While the issuance of debt increases the likelihood of failure, on average all-equity firms are about as likely to fail as levered firms.

However, the relation between net cash flow from financing activity (NCFF) and three-year outcome differs for all-equity and levered firms. Among levered firms, distressed firms with negative or zero NCFF are less likely to fail than firms with positive NCFF, though the result is significant only for the 1988, 1993, and 1998 pooled sample. One explanation is that by paying off long-term debt, levered firms are able to reduce their risk of future distress. There is no significant relation between NCFF and outcome for all-equity firms.

Tables 7 and 8 replicate Table 3 for all-equity and levered firms, respectively. The results are consistent with findings presented in Table 3. All-equity firms that issue debt are more likely to fail than firms that issue equity in each sample period, and the relation is significant at the 10% level for the 1988 and the 1988, 1993, and 1998 pooled samples. Moreover, all-equity firms that use the proceeds from large-scale external finance to cover an operating loss are more likely to fail than firms that use the funds for investment in each sample year, and the relation is significant at the 10% level for each sample period except 1988.

Although levered firms that issue debt are more likely to fail than levered firms that issue equity, Table 8 shows that the relation is statistically insignificant in each sample period. However, the use of external financing proceeds continues to impart an influence on firm survival; levered firms that secure outside finance to cover an operating loss fail significantly more often than those that invest the proceeds.

These empirical results have implications for both the Traditional Tradeoff Theory and the Pecking Order Hypothesis. Overall, there are a number of results that are consistent with the Traditional Tradeoff Theory. First, all-equity firms generally are smaller and have higher average business risk (i.e., σ_A) than levered firms. Second, firms that issue debt have a higher incidence of failure than firms that issue equity, suggesting that bankruptcy costs are real and significant. In general, leverage emerges as an important factor in the analysis of distress. Irrespective of a firm's FCS, a firm that issues debt is more likely to fail than a firm that issues equity. Moreover, a firm's leverage has a substantial effect on its FCS.

On the other hand, the sheer number of distressed firms that issue additional debt appears to conflict with the predictions of TTT. On average, the costs of issuing debt overwhelm the benefits for distressed firms; the purported benefits of debt, i.e., the tax deductibility of interest and the reduction of free cash flow agency conflicts, seem to be considerably smaller than expected bankruptcy costs. But in 1988, for example, 116 (53%) of 219 firms that received large amounts of external financing (i.e., NCFF/TA>10%) issued debt.

The Pecking Order Hypothesis predicts that equity is a last resort source of external finance. Thus, failure rates should be higher among firms that issue equity compared to firms that issue debt. However, Part II empirical findings indicate the opposite: debt issuers fail more often than equity issuers. Other results also appear to be at odds with the predictions of the Pecking Order Hypothesis. According to the Pecking Order Hypothesis, quintile 1 firms will avoid issuing external finance. But many quintile 1 firms engage in external finance, and many do so to cover an operating loss. Moreover, quintile 1 firms issue equity about as often as they issue debt, which does not support the view of equity as a last resort financing option.

5. Conclusion

In Part I, a measure of financial condition is developed to facilitate the identification of distressed firms for Part II. By using three widely-available variables, a large sample of distressed firms is obtained; a total of 2,475 distressed firms are identified over three separate sample periods. The literature review revealed a large volume of research but few studies if any that provide a truly comprehensive picture of

distress. The purpose of Part II is to illuminate the dynamics of distress by providing empirical evidence on external financing decisions and, more importantly, the interaction of various responses and distress resolution.

The key results can be summarized as follows. First, there is no support for Hypothesis 1; distressed firms issue equity as often as, and sometimes more often than, they issue debt. Second, inconsistent with Hypothesis 2, firms that issue equity fail *less* often than firms that issue debt. Third, there is some support for Hypothesis 3: Distressed firms do issue outside equity. However, distressed firms also issue substantial amounts of new debt. Fourth, there is strong support for Hypothesis 4: Distressed firms that use the proceeds from external financing activities to cover an operating loss are significantly more likely to fail than firms that invest the funds. Fifth, there is a strong inverse relation between operating performance in distress and failure rates, supporting Hypothesis 5. Finally, there is no support for Hypothesis 6; all-equity firms are no more likely to fail than levered firms.

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Table 1

Distribution of FCS for Surviving Firms in Years t+1 through t+3

FCS is calculated for year-end t sample firms in years t+1 through t+3. FCS is calculated separately for all sample firms and for quintile 1 firms. The coefficients and intercepts used to calculate FCS_{t+i} (i = 1 to 3) are obtained from an ordered probit analysis of rated firms in year t+i. The coefficients and intercepts obtained from ordered probit are then applied to the set of independent variables for year-end t firms in year t+i. If a firm delists for any reason in year t+i, FCS_{t+i} is missing.

	Full Sample				Quintile 1			
	FCS_t	FCS_{t+1}	FCS_{t+2}	FCS_{t+3}	FCS_t	FCS_{t+1}	FCS_{t+2}	FCS_{t+3}
Panel A: 1988								
Mean	16.080	15.682	15.712	15.721	23.291	22.412	21.706	21.941
Standard Error	0.083	0.083	0.084	0.099	0.096	0.119	0.146	0.221
Median	15.860	15.505	15.566	15.641	22.510	21.900	21.462	21.542
Standard Deviation	5.028	4.781	4.683	5.321	2.608	2.948	3.287	4.466
Sample Variance	25.280	22.861	21.933	28.315	6.801	8.692	10.801	19.944
Minimum	2.704	3.362	3.252	2.867	21.100	15.689	13.167	13.573
Maximum	48.353	48.908	49.098	56.230	48.353	48.908	49.098	56.230
Count	3689	3350	3089	2874	738	617	504	409
Number Missing (cum.)		339	600	815		121	234	329
Number Delisted (cum.)		264	540	764		91	209	309
Panel B: 1993								
Mean	15.585	15.884	16.190	15.882	22.163	22.639	22.855	21.427
Standard Error	0.076	0.081	0.091	0.091	0.110	0.146	0.183	0.195
Median	15.660	15.963	16.011	15.913	22.489	22.324	23.147	22.166
Standard Deviation	4.748	4.902	5.316	5.101	3.078	3.794	4.463	4.543
Sample Variance	22.543	24.029	28.264	26.019	9.473	14.394	19.923	20.636
Minimum	3.501	3.539	3.397	3.557	19.050	14.190	13.331	11.602
Maximum	101.899	66.114	58.794	54.923	45.759	66.114	58.794	54.923
Count	3908	3642	3378	3148	782	675	594	541
Number Missing (cum.)		266	530	760		107	188	241
Number Delisted (cum.)		202	461	709		81	171	230
Panel C: 1998								
Mean	15.869	15.519	16.076	16.109	22.125	20.833	21.500	21.089
Standard Error	0.066	0.065	0.077	0.086	0.117	0.139	0.159	0.183
Median	16.030	15.698	15.948	16.100	21.436	19.720	21.742	21.754
Standard Deviation	4.554	4.190	4.603	4.820	3.630	3.823	3.964	4.064
Sample Variance	20.743	17.556	21.192	23.228	13.174	14.612	15.715	16.518
Minimum	3.165	3.885	3.325	2.517	18.684	12.365	13.214	11.101
Maximum	72.980	44.078	50.099	48.135	48.986	41.970	50.099	48.135
Count	4777	4120	3601	3155	955	753	622	491
Number Missing (cum.)		657	1176	1622		202	333	464
Number Delisted (cum.)		553	1089	1559		181	310	443

Table 2

Distressed Firms: External Financing Status and 3-Year Outcome

Distressed firms (i.e., FCS Quintile 1 firms at year-end t) are sorted into indicated categories by year t+1 ratio of net cash flow from financing activities to total assets (NCFF/TA), and the percent of firms acquired or delisted for performance by year-end t+3 is calculated for each category. Results are shown individually for t=1988, 1993, and 1998 (Panels A, B, and C, resp.), and combinations of those years (Panels D and E).

									Average Values (Yr-end t)			
	N	% of Q1	Merger	% Merger	Perf.	% Perf.	Total	% Delisted	FCS	Size	Lev	σ_V
Panel A: 1988												
(1) NCFF/TA Missing	91	12.3	19	20.9	64	70.3	83	91.2	23.5	3.3	0.213	0.491
(2) NCFF/TA < 0	239	32.4	13	5.4	71	29.7	84	35.1	22.9	3.3	0.188	0.525
(3) NCFF/TA = 0	29	3.9	0	0.0	13	44.8	13	44.8	23.3	3.0	0.244	0.485
(4) NCFF/TA < 10%	159	21.6	8	5.0	41	25.8	49	30.8	23.0	3.3	0.197	0.523
(5) NCFF/TA > 10%	219	29.7	7	3.2	73	33.3	80	36.5	23.8	3.3	0.186	0.530
Total (Quintile 1)	737	100.0	47	6.4	262	35.5	309	41.9	23.3	3.2	0.173	0.569

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFF = 0 v. NCFF > 0	1.18	0.3217	0.7476
Large (>10%) v. Small (<10%) NCFF/TA	7.55	1.5783	0.1145

Panel B: 1998												
(1) NCFF/TA Missing	109	11.4	51	46.8	54	49.5	105	96.3	22.0	3.2	0.171	0.890
(2) NCFF/TA < 0	247	25.9	25	10.1	72	29.1	97	39.3	21.6	2.9	0.204	0.800
(3) NCFF/TA = 0	21	2.2	0	0.0	11	52.4	11	52.4	23.3	2.3	0.055	1.053
(4) NCFF/TA < 10%	212	22.2	17	8.0	63	29.7	80	37.7	21.5	3.2	0.150	0.865
(5) NCFF/TA > 10%	366	38.3	17	4.6	133	36.3	150	41.0	22.8	3.5	0.094	1.075
Total (Quintile 1)	955	100.0	110	11.5	333	34.9	443	46.4	22.1	3.2	0.143	0.936

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFF = 0 v. NCFF > 0	-2.94	-0.8462	0.3974
Large (>10%) v. Small (<10%) NCFF/TA	6.62	1.6207	0.1051

Panel C: 1993												
(1) NCFF/TA Missing	68	8.7	24	35.3	40	58.8	64	94.1	22.9	2.4	0.154	0.946
(2) NCFF/TA < 0	272	34.8	21	7.7	42	15.4	63	23.2	21.7	2.6	0.222	0.762
(3) NCFF/TA = 0	29	3.7	1	3.4	5	17.2	6	20.7	22.6	2.0	0.041	0.934
(4) NCFF/TA < 10%	164	21.0	8	4.9	28	17.1	36	22.0	21.7	2.9	0.188	0.838
(5) NCFF/TA = 10%	249	31.8	8	3.2	53	21.3	61	24.5	22.6	3.0	0.096	1.025
Total (Quintile 1)	782	100.0	62	7.9	168	21.5	230	29.4	22.2	2.8	0.162	0.884

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFF = 0 v. NCFF > 0	-4.00	-1.3753	0.1690
Large (>10%) v. Small (<10%) NCFF/TA	4.21	1.0548	0.2915

Panel D: 1988 & 1998												
(1) NCFF/TA Missing	200	11.8	70	35.0	118	59.0	188	94.0	22.7	3.2	0.190	0.708
(2) NCFF/TA < 0	486	28.7	38	7.8	143	29.4	181	37.2	22.2	3.1	0.196	0.665
(3) NCFF/TA = 0	50	3.0	0	0.0	24	48.0	24	48.0	23.3	2.7	0.165	0.723
(4) NCFF/TA < 10%	371	21.9	25	6.7	104	28.0	129	34.8	22.2	3.2	0.170	0.719
(5) NCFF/TA > 10%	585	34.6	24	4.1	206	35.2	230	39.3	23.2	3.4	0.128	0.871
Total (Quintile 1)	1692	100.0	157	9.3	595	35.2	752	44.4	22.6	3.2	0.156	0.776

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFF = 0 v. NCFF > 0	-1.27	-0.5047	0.6138
Large (>10%) v. Small (<10%) NCFF/TA	7.18	2.3115	0.0208

Panel E: 1988, 1993, & 1998												
(1) NCFF/TA Missing	268	10.8	94	35.1	158	59.0	252	94.0	22.7	3.0	0.181	0.768
(2) NCFF/TA < 0	758	30.6	59	7.8	185	24.4	244	32.2	22.1	2.9	0.205	0.700
(3) NCFF/TA = 0	79	3.2	1	1.3	29	36.7	30	38.0	23.0	2.4	0.119	0.801
(4) NCFF/TA < 10%	535	21.6	33	6.2	132	24.7	165	30.8	22.0	3.1	0.175	0.755
(5) NCFF/TA > 10%	834	33.7	32	3.8	259	31.1	291	34.9	23.0	3.3	0.119	0.917
Total (Quintile 1)	2474	100.0	219	8.9	763	30.8	982	39.7	22.5	3.1	0.158	0.810

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFF = 0 v. NCFF > 0	-2.99	-1.5292	0.1262
Large (>10%) v. Small (<10%) NCFF/TA	6.38	2.5508	0.0107

Table 3

Distressed Firms with Heavy External Financing: Source of External Funds, Use of External Funds, and 3-Year Outcome

Distressed firms (i.e., FCS Quintile 1 firms at year-end t) for which net cash flow from financing activity to total assets (NCFF/TA) exceeds 10 percent are sorted into categories according to the predominant source of external financing (i.e., debt, equity, or other fin. act.) and then cross-sorted into sub-categories according to predominant use of funds (i.e., to cover an operating loss or for investment). Then the percent of firms acquired or delisted for performance by year-end t+3 is calculated for each category and sub-category. Results are shown individually for t=1988, 1993, and 1998 (Panels A, B, and C, resp.), and combinations of those years (Panels D and E).

									Average Values (Yr-end t)			
	N	% of N	Merger	% Merge	Perf.	% Perf.	Total	% Delisted	FCS	Size	Lev	σ_V
Panel A: 1988												
NCFF/TA > 10%	219	100.0	7	3.2	73	33.3	80	36.5	23.8	3.3	0.186	0.530
Issued Debt	116	100.0	5	4.3	42	36.2	47	40.5	23.4	3.3	0.208	0.503
Covered Operating Loss	64	55.2	3	4.7	28	43.8	31	48.4	23.7	3.2	0.208	0.486
Investment	52	44.8	2	3.8	14	26.9	16	30.8	23.1	3.2	0.228	0.495
Issued Equity	89	100.0	2	2.2	25	28.1	27	30.3	24.4	3.3	0.212	0.494
Covered Operating Loss	60	67.4	2	3.3	22	36.7	24	40.0	24.4	3.2	0.214	0.488
Investment	29	32.6	0	0.0	3	10.3	3	10.3	24.6	3.0	0.244	0.485
Other Financing Activity	14	100.0	0	0.0	6	42.9	6	42.9	23.2	2.8	0.173	0.487
Covered Operating Loss	6	42.9	0	0.0	6	100.0	6	100.0	24.2	2.8	0.115	0.605
Investment	8	57.1	0	0.0	0	0.0	0	0.0	22.4	2.7	0.112	0.552

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	8.12	1.2281	0.2194
Covered Loss v. Invested Proceeds	23.98	3.6968	0.0002

Panel B: 1998												
NCFF/TA > 10%	366	100.0	17	4.6	133	36.3	150	41.0	22.8	3.5	0.094	1.075
Issued Debt	117	100.0	5	4.3	49	41.9	54	46.2	22.0	3.5	0.186	0.916
Covered Operating Loss	46	39.3	2	4.3	27	58.7	29	63.0	22.8	3.1	0.142	1.003
Investment	71	60.7	3	4.2	22	31.0	25	35.2	21.5	3.8	0.214	0.859
Issued Equity	234	100.0	10	4.3	79	33.8	89	38.0	23.2	3.4	0.050	1.151
Covered Operating Loss	132	56.4	3	2.3	59	44.7	62	47.0	23.5	3.2	0.054	1.163
Investment	102	43.6	7	6.9	20	19.6	27	26.5	22.8	3.8	0.046	1.136
Other Financing Activity	15	100.0	2	13.3	5	33.3	7	46.7	23.2	4.2	0.059	1.135
Covered Operating Loss	10	66.7	0	0.0	4	40.0	4	40.0	22.7	3.8	0.089	1.031
Investment	5	33.3	2	40.0	1	20.0	3	60.0	24.1	4.9	0.000	1.343

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	8.12	1.4898	0.1363
Covered Loss v. Invested Proceeds	23.72	4.7147	0.0000

Table 3 (cont'd)

	N	% of N	Merger	% Merge	Perf.	% Perf.	Total	% Delisted	Average Values (Yr-end t) FCS	Size	Lev	σ_ε
Panel C: 1993												
NCFF/TA >= 10%	249	100.0	8	3.2	53	21.3	61	24.5	22.6	3.0	0.096	1.025
Issued Debt	97	100.0	5	5.2	21	21.6	26	26.8	22.2	2.9	0.161	0.909
Covered Operating Loss	38	39.2	3	7.9	12	31.6	15	39.5	22.5	2.7	0.143	0.937
Investment	59	60.8	2	3.4	9	15.3	11	18.6	21.9	3.0	0.173	0.891
Issued Equity	146	100.0	3	2.1	31	21.2	34	23.3	22.8	3.1	0.055	1.082
Covered Operating Loss	86	58.9	0	0.0	27	31.4	27	31.4	22.5	2.9	0.051	1.032
Investment	60	41.1	3	5.0	4	6.7	7	11.7	23.4	3.4	0.061	1.154
Other Financing Activity	6	100.0	0	0.0	1	16.7	1	16.7	25.8	2.8	0.030	1.497
Covered Operating Loss	4	66.7	0	0.0	1	25.0	1	25.0	23.2	2.2	0.024	0.961
Investment	2	33.3	0	0.0	0	0.0	0	0.0	31.0	3.9	0.040	2.570

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	0.42	0.0775	0.9382
Covered Loss v. Invested Proceeds	20.51	3.9511	0.0001

Panel D: 1988 & 1998												
NCFF/TA >= 10%	585	100.0	24	4.1	206	35.2	230	39.3	23.2	3.4	0.128	0.871
Issued Debt	233	100.0	10	4.3	91	39.1	101	43.3	22.7	3.4	0.197	0.710
Covered Operating Loss	110	47.2	5	4.5	55	50.0	60	54.5	23.3	3.2	0.180	0.702
Investment	123	52.8	5	4.1	36	29.3	41	33.3	22.2	3.5	0.220	0.705
Issued Equity	323	100.0	12	3.7	104	32.2	116	35.9	23.5	3.4	0.095	0.970
Covered Operating Loss	192	59.4	5	2.6	81	42.2	86	44.8	23.8	3.2	0.104	0.952
Investment	131	40.6	7	5.3	23	17.6	30	22.9	23.2	3.6	0.090	0.992
Other Financing Activity	29	100.0	2	6.9	11	37.9	13	44.8	23.2	3.5	0.114	0.822
Covered Operating Loss	16	55.2	0	0.0	10	62.5	10	62.5	23.3	3.4	0.099	0.872
Investment	13	44.8	2	15.4	1	7.7	3	23.1	23.1	3.6	0.069	0.856

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	6.86	1.6719	0.0945
Covered Loss v. Invested Proceeds	23.44	5.9122	0.0000

Panel E: 1988, 1993, & 1998												
NCFF/TA >= 10%	834	100.0	32	3.8	259	31.1	291	34.9	23.0	3.3	0.119	0.917
Issued Debt	330	100.0	15	4.5	112	33.9	127	38.5	22.6	3.2	0.186	0.769
Covered Operating Loss	148	44.8	8	5.4	67	45.3	75	50.7	23.1	3.0	0.171	0.763
Investment	182	55.2	7	3.8	45	24.7	52	28.6	22.1	3.4	0.205	0.766
Issued Equity	469	100.0	15	3.2	135	28.8	150	32.0	23.3	3.3	0.083	1.005
Covered Operating Loss	278	59.3	5	1.8	108	38.8	113	40.6	23.4	3.1	0.088	0.977
Investment	191	40.7	10	5.2	27	14.1	37	19.4	23.2	3.5	0.081	1.042
Other Financing Activity	35	100.0	2	5.7	12	34.3	14	40.0	23.6	3.4	0.100	0.938
Covered Operating Loss	20	57.1	0	0.0	11	55.0	11	55.0	23.2	3.2	0.084	0.889
Investment	15	42.9	2	13.3	1	6.7	3	20.0	24.2	3.6	0.065	1.085

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	5.15	1.5524	0.1206
Covered Loss v. Invested Proceeds	22.89	7.1256	0.0000

Table 4

Distressed Firms: Internal Funds Flow and 3-Year Outcome

Distressed firms (i.e., FCS Quintile 1 firms at year-end t) are sorted into indicated categories by year t+1 ratio of net cash flow from operations to total assets (NCFO/TA), and the percent of firms acquired or delisted for performance by year-end t+3 is calculated for each category. Results are shown individually for t=1988, 1993, and 1998 (Panels A, B, and C, resp.), and combinations of these years (Panels D and E).

									Average Values (Yr-end t)			
	N	% of Total	Merger	% Merger	Perf	% Perf	Total	% Delisted	FCS	Size	Lev	σ_X
Panel A: 1988												
NCFO/TA > 10%	124	20.3	6	4.8	16	12.9	22	17.7	23.0	3.3	0.202	0.514
0 = NCFO/TA = 10%	168	27.5	7	4.2	30	17.9	37	22.0	22.8	3.3	0.194	0.519
(10%) = NCFO/TA < 0	128	21.0	9	7.0	39	30.5	48	37.5	23.4	3.2	0.206	0.517
NCFO/TA < (10%)	190	31.1	5	2.6	75	39.5	80	42.1	23.8	3.3	0.187	0.526
Total	610	100.0	27	4.4	160	26.2	187	30.7	23.3	3.2	0.176	0.562

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFO = 0 v. NCFO < 0	-20.10	-5.6364	0.0000
Large (>10%) Profit v. Large (<10%) Loss	-26.57	-5.0732	0.0000
Large (>10%) Loss v. Small (<10%) Loss	9.00	1.6421	0.1006

Panel B: 1998												
NCFO/TA > 10%	157	21.0	18	11.5	15	9.6	33	21.0	21.4	3.4	0.135	0.893
0 = NCFO/TA = 10%	160	21.4	12	7.5	35	21.9	47	29.4	21.3	3.2	0.221	0.797
(10%) = NCFO/TA < 0	131	17.5	9	6.9	40	30.5	49	37.4	21.4	3.2	0.176	0.815
NCFO/TA < (10%)	301	40.2	18	6.0	94	31.2	112	37.2	23.2	3.4	0.062	1.131
Total	749	100.0	57	7.6	184	24.6	241	32.2	22.1	3.3	0.131	0.955

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFO = 0 v. NCFO < 0	-15.25	-4.7888	0.0000
Large (>10%) Profit v. Large (<10%) Loss	-21.68	-5.1701	0.0000
Large (>10%) Loss v. Small (<10%) Loss	0.69	0.1435	0.8859

Table 4 (cont'd)

	N	% of Total	Merger	% Merger	Perf	% Perf	Total	% Delisted	Average Values (Yr-end t) FCS	Size	Lev	σ_λ
Panel C: 1993												
NCFO/TA > 10%	158	23.4	16	10.1	4	2.5	20	12.7	21.8	2.8	0.164	0.822
0 = NCFO/TA = 10%	182	26.9	11	6.0	18	9.9	29	15.9	21.5	2.9	0.231	0.757
(10%) = NCFO/TA < 0	138	20.4	5	3.6	26	18.8	31	22.5	22.3	2.7	0.180	0.886
NCFO/TA < (10%)	198	29.3	6	3.0	40	20.2	46	23.2	22.5	3.0	0.074	1.019
Total	676	100.0	38	5.6	88	13.0	126	18.6	22.0	2.8	0.159	0.875

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFO = 0 v. NCFO < 0	-13.17	-5.0888	0.0000
Large (>10%) Profit v. Large (<10%) Loss	-17.67	-5.0330	0.0000
Large (>10%) Loss v. Small (<10%) Loss	1.36	0.3090	0.7573

Panel D: 1988 & 1998												
NCFO/TA > 10%	281	20.7	24	8.5	31	11.0	55	19.6	22.1	3.4	0.165	0.725
0 = NCFO/TA = 10%	328	24.1	19	5.8	65	19.8	84	25.6	22.1	3.3	0.207	0.655
(10%) = NCFO/TA < 0	259	19.1	18	6.9	79	30.5	97	37.5	22.4	3.2	0.191	0.667
NCFO/TA < (10%)	491	36.1	23	4.7	169	34.4	192	39.1	23.4	3.3	0.110	0.897
Total	1359	100.0	84	6.2	344	25.3	428	31.5	22.6	3.3	0.151	0.778

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFO = 0 v. NCFO < 0	-17.30	-7.2956	0.0000
Large (>10%) Profit v. Large (<10%) Loss	-23.39	-7.1363	0.0000
Large (>10%) Loss v. Small (<10%) Loss	3.92	1.0843	0.2782

Panel E: 1988, 1993, & 1998												
NCFO/TA > 10%	439	21.6	40	9.1	35	8.0	75	17.1	22.0	3.2	0.165	0.760
0 = NCFO/TA = 10%	510	25.1	30	5.9	83	16.3	113	22.2	21.8	3.1	0.216	0.691
(10%) = NCFO/TA < 0	397	19.5	23	5.8	105	26.4	128	32.2	22.4	3.0	0.187	0.743
NCFO/TA < (10%)	689	33.9	29	4.2	209	30.3	238	34.5	23.1	3.2	0.100	0.932
Total	2035	100.0	122	6.0	432	21.2	554	27.2	22.4	3.1	0.154	0.810

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFO = 0 v. NCFO < 0	-16.48	-9.0690	0.0000
Large (>10%) Profit v. Large (<10%) Loss	-22.36	-8.8934	0.0000
Large (>10%) Loss v. Small (<10%) Loss	3.89	1.3602	0.1738

Table 5

Distressed Firms: Internal Funds Flow, External Financing, and 3-Year Outcome

Distressed firms (i.e., FCS quintile 1 firms at year-end t) are sorted into categories by year t+1 ratio of net cash flow from operations to total assets (NCFO/TA), and then cross-sorted into sub-categories according to predominant external financing, if any. Then the percent of firms acquired or delisted for performance by year-end t+3 is calculated for each category and sub-category. Results are shown individually for t=1988,1993, and 1998 (Panels A,B, and C, resp.), and combinations of these years (Panels D and E).

									Average Values (Yr-end t)			
	N	% of N	Merger	% Merger	Perf	% Perf	Total	% Delisted	FCS	Size	Lev	σ_ε
Panel A: 1988												
NCFO < 0	338	100.0	14	4.1	133	39.3	147	43.5	23.6	3.3	0.188	0.527
(1) NCFF = 0	74	21.9	4	5.4	34	45.9	38	51.4	23.1	3.2	0.218	0.484
(2) Debt Issue	151	44.7	7	4.6	61	40.4	68	45.0	23.3	3.3	0.199	0.522
(3) Equity Issue	99	29.3	2	2.0	31	31.3	33	33.3	24.5	3.3	0.220	0.487
(4) Other FA	12	3.6	1	8.3	7	58.3	8	66.7	23.7	2.9	0.181	0.503
NCFO = 0	311	100.0	14	4.5	64	20.6	78	25.1	22.8	3.3	0.190	0.524
(1) NCFF = 0	193	62.1	9	4.7	49	25.4	58	30.1	22.9	3.3	0.186	0.525
(2) Debt Issue	77	24.8	3	3.9	13	16.9	16	20.8	23.0	3.3	0.212	0.490
(3) Equity Issue	30	9.6	2	6.7	2	6.7	4	13.3	22.5	3.0	0.236	0.500
(4) Other FA	7	2.3	0	0.0	0	0.0	0	0.0	22.5	2.6	0.120	0.570

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFO = 0 v. NCFO < 0	-18.77	-5.1955	0.0000
NCFO Neg: Debt v. Equity Issuers	9.08	1.4566	0.1452
NCFO Pos: Debt v. Equity Issuers	10.22	1.3673	0.1715

Panel B: 1998												
NCFO < 0	504	100.0	28	5.6	205	40.7	233	46.2	22.6	3.2	0.109	1.014
(1) NCFF = 0	88	17.5	3	3.4	40	45.5	43	48.9	22.0	2.6	0.181	0.825
(2) Debt Issue	131	26.0	7	5.3	59	45.0	66	50.4	21.9	3.2	0.186	0.881
(3) Equity Issue	257	51.0	17	6.6	92	35.8	109	42.4	23.1	3.4	0.050	1.136
(4) Other FA	27	5.4	1	3.7	13	48.1	14	51.9	23.5	2.9	0.060	1.112
NCFO = 0	343	100.0	31	9.0	75	21.9	106	30.9	21.4	3.3	0.184	0.833
(1) NCFF = 0	180	52.5	22	12.2	43	23.9	65	36.1	21.5	3.0	0.198	0.818
(2) Debt Issue	86	25.1	2	2.3	26	30.2	28	32.6	20.9	3.3	0.259	0.713
(3) Equity Issue	73	21.3	6	8.2	6	8.2	12	16.4	21.6	3.8	0.069	0.999
(4) Other FA	3	0.9	1	33.3	0	0.0	1	33.3	22.0	5.8	0.018	1.115

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFO = 0 v. NCFO < 0	-18.81	-5.7121	0.0000
NCFO Neg: Debt v. Equity Issuers	9.24	1.7654	0.0775
NCFO Pos: Debt v. Equity Issuers	22.01	3.4500	0.0006

Table 5 (cont'd)

	N	% of N	Merger	% Merger	Perf	% Perf	Total	% Delisted	Average Values (Yr-end t) FCS	Size	Lev	σ_Δ
Panel C: 1993												
NCFO < 0	356	100.0	11	3.1	87	24.4	98	27.5	22.5	2.8	0.121	0.963
(1) NCFF = 0	70	19.7	4	5.7	16	22.9	20	28.6	21.9	2.3	0.132	0.828
(2) Debt Issue	109	30.6	5	4.6	28	25.7	33	30.3	22.4	2.7	0.197	0.893
(3) Equity Issue	165	46.3	2	1.2	40	24.2	42	25.5	22.7	3.1	0.070	1.051
(4) Other FA	12	3.4	0	0.0	3	25.0	3	25.0	23.5	3.1	0.055	1.183
NCFO = 0	358	100.0	27	7.5	41	11.5	68	19.0	21.7	2.8	0.204	0.794
(1) NCFF = 0	231	64.5	18	7.8	31	13.4	49	21.2	21.8	2.6	0.226	0.763
(2) Debt Issue	65	18.2	3	4.6	9	13.8	12	18.5	21.7	3.0	0.210	0.832
(3) Equity Issue	57	15.9	4	7.0	1	1.8	5	8.8	21.5	3.2	0.101	0.884
(4) Other FA	5	1.4	2	40.0	0	0.0	2	40.0	21.1	2.9	0.304	0.656

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFO = 0 v. NCFO < 0	-12.99	-4.5230	0.0000
NCFO Neg: Debt v. Equity Issuers	1.45	0.2711	0.7863
NCFO Pos: Debt v. Equity Issuers	12.09	2.4292	0.0151

Panel D: 1988 & 1998

NCFO < 0	842	100.0	42	5.0	338	40.1	380	45.1	23.0	3.2	0.141	0.818
(1) NCFF = 0	162	19.2	7	4.3	74	45.7	81	50.0	22.5	2.9	0.198	0.669
(2) Debt Issue	282	33.5	14	5.0	120	42.6	134	47.5	22.7	3.2	0.193	0.689
(3) Equity Issue	356	42.3	19	5.3	123	34.6	142	39.9	23.5	3.4	0.097	0.956
(4) Other FA	39	4.6	2	5.1	20	51.3	22	56.4	23.5	2.9	0.098	0.925
NCFO = 0	654	100.0	45	6.9	139	21.3	184	28.1	22.1	3.3	0.187	0.686
(1) NCFF = 0	373	57.0	31	8.3	92	24.7	123	33.0	22.2	3.1	0.192	0.666
(2) Debt Issue	163	24.9	5	3.1	39	23.9	44	27.0	21.9	3.3	0.237	0.608
(3) Equity Issue	103	15.7	8	7.8	8	7.8	16	15.5	21.9	3.6	0.118	0.854
(4) Other FA	10	1.5	1	10.0	0	0.0	1	10.0	22.3	3.6	0.089	0.733

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFO = 0 v. NCFO < 0	-18.89	-7.7762	0.0000
NCFO Neg: Debt v. Equity Issuers	8.00	2.0672	0.0387
NCFO Pos: Debt v. Equity Issuers	16.16	3.3659	0.0008

Panel E: 1988, 1993, & 1998

NCFO < 0	1198	100.0	53	4.4	425	35.5	478	39.9	22.9	3.1	0.135	0.861
(1) NCFF = 0	232	19.4	11	4.7	90	38.8	101	43.5	22.3	2.7	0.178	0.717
(2) Debt Issue	391	32.6	19	4.9	148	37.9	167	42.7	22.6	3.1	0.194	0.746
(3) Equity Issue	521	43.5	21	4.0	163	31.3	184	35.3	23.3	3.3	0.089	0.986
(4) Other FA	51	4.3	2	3.9	23	45.1	25	49.0	23.5	2.9	0.087	0.985
NCFO = 0	1012	100.0	72	7.1	180	17.8	252	24.9	22.0	3.1	0.193	0.724
(1) NCFF = 0	604	59.7	49	8.1	123	20.4	172	28.5	22.1	2.9	0.205	0.703
(2) Debt Issue	228	22.5	8	3.5	48	21.1	56	24.6	21.8	3.2	0.229	0.672
(3) Equity Issue	160	15.8	12	7.5	9	5.6	21	13.1	21.7	3.4	0.112	0.864
(4) Other FA	15	1.5	3	20.0	0	0.0	3	20.0	21.9	3.4	0.161	0.708

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
NCFO = 0 v. NCFO < 0	-17.69	-9.2920	0.0000
NCFO Neg: Debt v. Equity Issuers	6.57	2.0700	0.0385
NCFO Pos: Debt v. Equity Issuers	15.43	4.2256	0.0000

Table 6

Distressed All-Equity versus Levered Firms: External Financing and 3-Year Outcome

Distressed firms (i.e., FCS quintile 1 firms at year-end t) are sorted into two categories by year-end t leverage: all-equity firms and levered firms. Firms in each category are then cross-sorted into sub-categories by year t+1 ratio of net cash flow from financing to total assets (NCFF/TA). Then the percent of firms acquired or delisted for performance by year-end t+3 is calculated for each category and sub-category. Results are shown individually for t=1988, 1993, and 1998 (Panels A, B, and C, resp.), and combinations of these years (Panels D and E).

									Average Values (Yr-end t)			
	N	% of N	Merger	% Merger	Perf.	% Perf.	Total	% Delisted	FCS	Size	Lev	σ_V
Panel A: 1988												
All-Equity Firms	147	100.0	11	7.5	56	38.1	67	45.6	23.9	1.4	0.000	0.978
(1) NCFF Missing	25	17.0	7	28.0	16	64.0	23	92.0	24.4	1.3	0.000	1.027
(2) NCFF < 0	32	21.8	1	3.1	9	28.1	10	31.3	23.5	1.2	0.000	0.921
(3) NCFF = 0	25	17.0	0	0.0	12	48.0	12	48.0	23.3	0.6	0.000	0.853
(4) NCFF/TA < 10%	28	19.0	2	7.1	7	25.0	9	32.1	23.2	2.0	0.000	0.931
(5) NCFF/TA > 10%	37	25.2	1	2.7	12	32.4	13	35.1	24.9	1.9	0.000	1.113
Levered Firms	590	100.0	36	6.1	206	34.9	242	41.0	23.1	2.0	0.275	0.698
(1) NCFF Missing	66	11.2	12	18.2	48	72.7	60	90.9	23.2	1.7	0.300	0.658
(2) NCFF < 0	207	35.1	12	5.8	62	30.0	74	35.7	22.8	2.0	0.330	0.615
(3) NCFF = 0	4	0.7	0	0.0	1	25.0	1	25.0	23.7	1.0	0.026	0.905
(4) NCFF/TA < 10%	131	22.2	6	4.6	34	26.0	40	30.5	23.0	2.0	0.285	0.672
(5) NCFF/TA > 10%	182	30.8	6	3.3	61	33.5	67	36.8	23.6	2.1	0.202	0.820

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
All-Equity v. Levered Firms	3.18	0.7207	0.4711
All-Equity Firms: NCFF = 0 v. NCFF > 0	7.61	0.8935	0.3716
Levered Firms: NCFF = 0 v. NCFF > 0	-0.49	-0.1208	0.9039

Panel B: 1998												
All-Equity Firms	282	100.0	32	11.3	93	33.0	125	44.3	23.0	3.1	0.000	1.142
(1) NCFF Missing	27	9.6	15	55.6	11	40.7	26	96.3	22.2	2.9	0.000	1.052
(2) NCFF < 0	51	18.1	4	7.8	14	27.5	18	35.3	22.3	2.8	0.000	1.032
(3) NCFF = 0	16	5.7	0	0.0	8	50.0	8	50.0	24.0	2.4	0.000	1.172
(4) NCFF/TA < 10%	75	26.6	9	12.0	23	30.7	32	42.7	22.4	3.3	0.000	1.090
(5) NCFF/TA > 10%	113	40.1	4	3.5	37	32.7	41	36.3	23.7	3.3	0.000	1.243
Levered Firms	673	100.0	78	11.6	240	35.7	318	47.3	21.8	3.2	0.203	0.850
(1) NCFF Missing	82	12.2	36	43.9	43	52.4	79	96.3	21.9	3.3	0.227	0.836
(2) NCFF < 0	196	29.1	21	10.7	58	29.6	79	40.3	21.4	2.9	0.257	0.740
(3) NCFF = 0	5	0.7	0	0.0	3	60.0	3	60.0	21.3	2.3	0.230	0.671
(4) NCFF/TA < 10%	137	20.4	8	5.8	40	29.2	48	35.0	21.0	3.1	0.233	0.742
(5) NCFF/TA > 10%	253	37.6	13	5.1	96	37.9	109	43.1	22.4	3.6	0.136	1.000

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
All-Equity v. Levered Firms	-2.68	-0.7935	0.4275
All-Equity Firms: NCFF = 0 v. NCFF > 0	0.92	0.1386	0.8898
Levered Firms: NCFF = 0 v. NCFF > 0	-4.52	-1.1051	0.2691

Table 6 (cont'd)

	N	% of N	Merger	% Merger	Perf.	% Perf.	Total	% Delisted	Average Values (Yr-end t) FCS	Size	Lev	σ_ε
Panel C: 1993												
All-Equity Firms	191	100.0	12	6.3	41	21.5	53	27.7	22.4	2.7	0.000	1.035
(1) NCFF Missing	20	10.5	6	30.0	13	65.0	19	95.0	22.2	2.4	0.000	0.983
(2) NCFF < 0	44	23.0	3	6.8	7	15.9	10	22.7	22.1	2.3	0.000	0.951
(3) NCFF =0	24	12.6	1	4.2	3	12.5	4	16.7	22.3	2.0	0.000	0.945
(4) NCFF/TA < 10%	33	17.3	1	3.0	3	9.1	4	12.1	21.6	3.0	0.000	0.986
(5) NCFF/TA = 10%	70	36.6	1	1.4	15	21.4	16	22.9	23.1	3.1	0.000	1.157
Levered Firms	591	100.0	50	8.5	127	21.5	177	29.9	22.1	2.8	0.214	0.835
(1) NCFF Missing	48	8.1	18	37.5	27	56.3	45	93.8	23.2	2.5	0.219	0.930
(2) NCFF < 0	228	38.6	18	7.9	35	15.4	53	23.2	21.7	2.6	0.265	0.725
(3) NCFF =0	5	0.8	0	0.0	2	40.0	2	40.0	23.7	1.7	0.237	0.881
(4) NCFF/TA < 10%	131	22.2	7	5.3	25	19.1	32	24.4	21.8	2.9	0.235	0.801
(5) NCFF/TA = 10%	179	30.3	7	3.9	38	21.2	45	25.1	22.5	3.0	0.133	0.973

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
All-Equity v. Levered Firms	-0.02	-0.0067	0.9947
All-Equity Firms: NCFF = 0 v. NCFF > 0	-2.77	-0.4790	0.6319
Levered Firms: NCFF = 0 v. NCFF > 0	-4.44	-1.3219	0.1862

Panel D: 1988 & 1998												
All-Equity Firms	429	100.0	43	10.0	149	34.7	192	44.8	23.3	2.5	0.000	1.086
(1) NCFF Missing	52	12.1	22	42.3	27	51.9	49	94.2	23.3	2.1	0.000	1.040
(2) NCFF < 0	83	19.3	5	6.0	23	27.7	28	33.7	22.8	2.2	0.000	0.989
(3) NCFF =0	41	9.6	0	0.0	20	48.8	20	48.8	23.5	1.3	0.000	0.978
(4) NCFF/TA < 10%	103	24.0	11	10.7	30	29.1	41	39.8	22.6	2.9	0.000	1.047
(5) NCFF/TA = 10%	150	35.0	5	3.3	49	32.7	54	36.0	24.0	3.0	0.000	1.211
Levered Firms	1263	100.0	114	9.0	446	35.3	560	44.3	22.4	2.7	0.237	0.779
(1) NCFF Missing	148	11.7	48	32.4	91	61.5	139	93.9	22.5	2.5	0.259	0.757
(2) NCFF < 0	403	31.9	33	8.2	120	29.8	153	38.0	22.1	2.4	0.295	0.676
(3) NCFF =0	9	0.7	0	0.0	4	44.4	4	44.4	22.3	1.7	0.140	0.775
(4) NCFF/TA < 10%	268	21.2	14	5.2	74	27.6	88	32.8	22.0	2.5	0.258	0.708
(5) NCFF/TA = 10%	435	34.4	19	4.4	157	36.1	176	40.5	22.9	3.0	0.164	0.925

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
All-Equity v. Levered Firms	-0.58	-0.2177	0.8277
All-Equity Firms: NCFF = 0 v. NCFF > 0	3.45	0.6731	0.5009
Levered Firms: NCFF = 0 v. NCFF > 0	-2.76	-0.9556	0.3393

Panel E: 1988, 1993, & 1998												
All-Equity Firms	620	100.0	55	8.9	190	30.6	245	39.5	23.0	2.6	0.000	1.070
(1) NCFF Missing	72	11.6	28	38.9	40	55.6	68	94.4	23.0	2.2	0.000	1.024
(2) NCFF < 0	127	20.5	8	6.3	30	23.6	38	29.9	22.5	2.3	0.000	0.976
(3) NCFF =0	65	10.5	1	1.5	23	35.4	24	36.9	23.1	1.6	0.000	0.966
(4) NCFF/TA < 10%	136	21.9	12	8.8	33	24.3	45	33.1	22.4	3.0	0.000	1.032
(5) NCFF/TA = 10%	220	35.5	6	2.7	64	29.1	70	31.8	23.7	3.0	0.000	1.194
Levered Firms	1854	100.0	164	8.8	573	30.9	737	39.8	22.3	2.7	0.229	0.797
(1) NCFF Missing	196	10.6	66	33.7	118	60.2	184	93.9	22.6	2.5	0.249	0.799
(2) NCFF < 0	631	34.0	51	8.1	155	24.6	206	32.6	22.0	2.5	0.284	0.694
(3) NCFF =0	14	0.8	0	0.0	6	42.9	6	42.9	22.8	1.7	0.174	0.813
(4) NCFF/TA < 10%	399	21.5	21	5.3	99	24.8	120	30.1	21.9	2.7	0.250	0.738
(5) NCFF/TA = 10%	614	33.1	26	4.2	195	31.8	221	36.0	22.8	3.0	0.155	0.939

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
All-Equity v. Levered Firms	-0.26	-0.1218	0.9031
All-Equity Firms: NCFF = 0 v. NCFF > 0	0.36	0.0894	0.9288
Levered Firms: NCFF = 0 v. NCFF > 0	-4.06	-1.8068	0.0708

Table 7

Distressed All-Equity Firms with Heavy External Financing: Source of Funds, Use of Funds, and 3-Year Outcome

All-equity distressed firms (i.e., FCS quintile 1 firms at year-end t) for which net cash flow from financing to total assets (NCFF/TA) exceeds 10 percent are sorted into categories according to the predominant source of external financing (i.e., debt, equity, or other fin. act.), and then cross-sorted into sub-categories according to predominant use of funds (i.e., to cover an operating loss or for investment). Then the percent of firms acquired or delisted for performance by year-end t+3 is calculated for each category and sub-category. Results are shown individually for t=1988,1993, and 1998 (Panels A,B, and C, resp.), and combinations of these years (Panels D and E).

									Average Values (Yr-end t)			
	N	%	Merger	% Merger	Perf	% Perf	Total	% Delisted	FCS	Size	Lev	σ_V
Panel A: 1988												
NCFF/TA > 10%	37	100.0	1	2.7	12	32.4	13	35.1	24.9	1.9	0.000	1.113
Issued Debt	14	100.0	1	7.1	6	42.9	7	50.0	25.1	1.2	0.000	1.090
Covered Operating Loss	9	64.3	0	0.0	5	55.6	5	55.6	26.2	0.7	0.000	1.186
Investment	5	35.7	1	20.0	1	20.0	2	40.0	23.0	2.0	0.000	0.918
Issued Equity	20	100.0	0	0.0	3	15.0	3	15.0	24.9	2.3	0.000	1.141
Covered Operating Loss	16	80.0	0	0.0	3	18.8	3	18.8	24.6	2.4	0.000	1.125
Investment	4	20.0	0	0.0	0	0.0	0	0.0	25.9	1.5	0.000	1.204
Other Financing Activity	3	100.0	0	0.0	3	100.0	3	100.0	23.9	2.4	0.000	1.038
Covered Operating Loss	3	100.0	0	0.0	3	100.0	3	100.0	23.9	2.4	0.000	1.038
Investment	0	0.0	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	27.86	1.8120	0.0700
Covered Loss v. Invested Proceeds	28.18	1.5707	0.1162

Panel B: 1998

NCFF/TA > 10%	113	100.0	4	3.5	37	32.7	41	36.3	23.7	3.3	0.000	1.243
Issued Debt	22	100.0	0	0.0	9	40.9	9	40.9	24.4	3.2	0.000	1.359
Covered Operating Loss	10	45.5	0	0.0	5	50.0	5	50.0	25.9	2.7	0.000	1.518
Investment	12	54.5	0	0.0	4	33.3	4	33.3	23.1	3.6	0.000	1.227
Issued Equity	88	100.0	4	4.5	28	31.8	32	36.4	23.6	3.3	0.000	1.216
Covered Operating Loss	49	55.7	2	4.1	18	36.7	20	40.8	24.0	3.1	0.000	1.237
Investment	39	44.3	2	5.1	10	25.6	12	30.8	23.0	3.5	0.000	1.189
Other Financing Activity	3	100.0	0	0.0	0	0.0	0	0.0	22.9	5.1	0.000	1.186
Covered Operating Loss	2	66.7	0	0.0	0	0.0	0	0.0	23.8	4.1	0.000	1.216
Investment	1	33.3	0	0.0	0	0.0	0	0.0	21.2	7.1	0.000	1.125

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	9.09	0.8072	0.4196
Covered Loss v. Invested Proceeds	10.78	3.0280	0.0025

Table 7 (cont'd)

	N	%	Merger	% Merger	Perf	% Perf	Total	% Delisted	Average Values (Yr-end t) FCS	Size	Lev	σ_Δ
Panel C: 1993												
NCFF/TA = 10%	70	100.0	1	1.4	15	21.4	16	22.9	23.1	3.1	0.000	1.157
Issued Debt	16	100.0	0	0.0	5	31.3	5	31.3	21.4	2.9	0.000	0.963
Covered Operating Loss	7	43.8	0	0.0	3	42.9	3	42.9	21.9	2.5	0.000	1.011
Investment	9	56.3	0	0.0	2	22.2	2	22.2	21.0	3.3	0.000	0.925
Issued Equity	52	100.0	1	1.9	10	19.2	11	21.2	23.3	3.2	0.000	1.158
Covered Operating Loss	27	51.9	0	0.0	9	33.3	9	33.3	22.6	2.8	0.000	1.044
Investment	25	48.1	1	4.0	1	4.0	2	8.0	24.0	3.5	0.000	1.282
Other Financing Activity	2	100.0	0	0.0	0	0.0	0	0.0	32.8	3.5	0.000	2.685
Covered Operating Loss	1	50.0	0	0.0	0	0.0	0	0.0	23.1	2.9	0.000	1.031
Investment	1	50.0	0	0.0	0	0.0	0	0.0	42.5	4.2	0.000	1.340

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	12.02	1.0139	0.3106
Covered Loss v. Invested Proceeds	25.71	2.6216	0.0088

Panel D: 1988 & 1998												
NCFF/TA = 10%	150	100.0	5	3.3	49	32.7	54	36.000	24.0	3.0	0.000	1.211
Issued Debt	36	100.0	1	2.8	15	41.7	16	44.444	24.7	2.4	0.000	1.255
Covered Operating Loss	19	52.8	0	0.0	10	52.6	10	52.632	26.1	1.8	0.000	1.361
Investment	17	47.2	1	5.9	5	29.4	6	35.294	23.1	3.1	0.000	1.136
Issued Equity	108	100.0	4	3.7	31	28.7	35	32.407	23.8	3.1	0.000	1.202
Covered Operating Loss	65	60.2	2	3.1	21	32.3	23	35.385	24.2	3.0	0.000	1.210
Investment	43	39.8	2	4.7	10	23.3	12	27.907	23.3	3.3	0.000	1.190
Other Financing Activity	6	100.0	0	0.0	3	50.0	3	50.000	23.4	3.8	0.000	1.112
Covered Operating Loss	5	83.3	0	0.0	3	60.0	3	60.000	23.8	3.1	0.000	1.110
Investment	1	16.7	0	0.0	0	0.0	0	0.000	21.2	7.1	0.000	1.125

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	12.96	1.4446	0.1486
Covered Loss v. Invested Proceeds	13.61	1.7461	0.0808

Panel E: 1988, 1993, & 1998												
NCFF/TA = 10%	220	100.0	6	2.7	64	29.1	70	31.8	23.7	3.0	0.000	1.194
Issued Debt	52	100.0	1	1.9	20	38.5	21	40.4	23.7	2.6	0.000	1.165
Covered Operating Loss	26	50.0	0	0.0	13	50.0	13	50.0	24.9	2.0	0.000	1.267
Investment	26	50.0	1	3.8	7	26.9	8	30.8	22.4	3.2	0.000	1.063
Issued Equity	160	100.0	5	3.1	41	25.6	46	28.8	23.6	3.1	0.000	1.188
Covered Operating Loss	92	57.5	2	2.2	30	32.6	32	34.8	23.7	2.9	0.000	1.161
Investment	68	42.5	3	4.4	11	16.2	14	20.6	23.5	3.4	0.000	1.224
Other Financing Activity	8	100.0	0	0.0	3	37.5	3	37.5	25.7	3.7	0.000	1.505
Covered Operating Loss	6	75.0	0	0.0	3	50.0	3	50.0	23.7	3.1	0.000	1.096
Investment	2	25.0	0	0.0	0	0.0	0	0.0	31.8	5.6	0.000	2.732

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	12.84	1.7763	0.0757
Covered Loss v. Invested Proceeds	18.35	2.9714	0.0030

Table 8

Levered Firms with Heavy External Financing: Source of Funds, Use of Funds, and 3-Year Outcome

Levered distressed firms (i.e., FCS quintile 1 firms at year-end t) for which net cash flow from financing to total assets (NCFF/TA) exceeds 10 percent are sorted into categories according to the predominant source of external financing (i.e., debt, equity, or other fin. act.), and then cross-sorted into sub-categories according to predominant use of funds (i.e., to cover an operating loss or for investment). Then the percent of firms acquired or delisted for performance by year-end t+3 is calculated for each category and sub-category. Results are shown individually for t=1988,1993, and 1998 (Panels A,B, and C, resp.), and combinations of these years (Panels D and E).

									Average Values (Yr-end t)			
	N	%	Merger	% Merger	Perf.	% Perf.	Total	% Delisted	FCS	Size	Lev	σ_V
Panel A: 1988												
NCFF/TA > 10%	182	100.0	6	3.3	61	33.5	67	36.8	23.6	2.1	0.202	0.820
Issued Debt	104	100.0	4	3.8	36	34.6	40	38.5	23.2	2.1	0.256	0.723
Covered Operating Loss	55	52.9	3	5.5	23	41.8	26	47.3	23.3	2.2	0.228	0.769
Investment	49	47.1	1	2.0	13	26.5	14	28.6	23.0	1.9	0.289	0.672
Issued Equity	68	100.0	2	2.9	22	32.4	24	35.3	24.4	2.2	0.118	0.979
Covered Operating Loss	44	64.7	2	4.5	19	43.2	21	47.7	24.3	2.2	0.082	1.000
Investment	24	35.3	0	0.0	3	12.5	3	12.5	24.5	2.3	0.183	0.941
Other Financing Activity	10	100.0	0	0.0	3	30.0	3	30.0	23.1	1.9	0.214	0.744
Covered Operating Loss	3	30.0	0	0.0	3	100.0	3	100.0	24.5	1.5	0.072	0.986
Investment	7	70.0	0	0.0	0	0.0	0	0.0	22.6	2.1	0.275	0.640

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	2.26	0.3069	0.7589
Covered Loss v. Invested Proceeds	24.12	3.4210	0.0006

Panel B: 1998												
NCFF/TA > 10%	253	100.0	13	5.1	96	37.9	109	43.1	22.4	3.6	0.136	1.000
Issued Debt	94	100.0	4	4.3	40	42.6	44	46.8	21.4	3.6	0.231	0.808
Covered Operating Loss	35	37.2	1	2.9	22	62.9	23	65.7	21.9	3.1	0.187	0.849
Investment	59	62.8	3	5.1	18	30.5	21	35.6	21.1	3.8	0.258	0.784
Issued Equity	147	100.0	7	4.8	51	34.7	58	39.5	23.0	3.6	0.080	1.113
Covered Operating Loss	84	57.1	2	2.4	41	48.8	43	51.2	23.2	3.2	0.085	1.121
Investment	63	42.9	5	7.9	10	15.9	15	23.8	22.7	4.0	0.074	1.103
Other Financing Activity	12	100.0	2	16.7	5	41.7	7	58.3	23.3	3.9	0.074	1.122
Covered Operating Loss	8	66.7	0	0.0	4	50.0	4	50.0	22.4	3.7	0.111	0.985
Investment	4	33.3	2	50.0	1	25.0	3	75.0	24.9	4.4	0.000	1.397

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	7.86	1.2276	0.2196
Covered Loss v. Invested Proceeds	29.74	4.8742	0.0000

Table 8 (cont'd)

	N	%	Merger	% Merger	Perf.	% Perf.	Total	% Delisted	Average Values (Yr-end t) FCS	Size	Lev	σ_λ
Panel C: 1993												
NCFF/TA = 10%	179	100.0	7	3.9	38	21.2	45	25.1	22.5	3.0	0.133	0.973
Issued Debt	81	100.0	5	6.2	16	19.8	21	25.9	22.3	2.9	0.193	0.899
Covered Operating Loss	31	38.3	3	9.7	9	29.0	12	38.7	22.7	2.7	0.175	0.921
Investment	50	61.7	2	4.0	7	14.0	9	18.0	22.1	3.0	0.204	0.885
Issued Equity	94	100.0	2	2.1	21	22.3	23	24.5	22.6	3.1	0.086	1.040
Covered Operating Loss	59	62.8	0	0.0	18	30.5	18	30.5	22.4	3.0	0.074	1.027
Investment	35	37.2	2	5.7	3	8.6	5	14.3	22.9	3.2	0.105	1.062
Other Financing Activity	4	100.0	0	0.0	1	25.0	1	25.0	22.3	2.4	0.044	0.903
Covered Operating Loss	3	75.0	0	0.0	1	33.3	1	33.3	23.2	1.9	0.032	0.937
Investment	1	25.0	0	0.0	0	0.0	0	0.0	19.5	3.6	0.081	0.801

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	-2.59	-0.4180	0.6759
Covered Loss v. Invested Proceeds	18.48	3.0207	0.0025

Panel D: 1988 & 1998												
NCFF/TA = 10%	435	100.0	19	4.4	157	36.1	176	40.5	22.9	3.0	0.164	0.925
Issued Debt	198	100.0	8	4.0	76	38.4	84	42.4	22.3	2.8	0.244	0.764
Covered Operating Loss	90	45.5	4	4.4	45	50.0	49	54.4	22.7	2.6	0.212	0.800
Investment	108	54.5	4	3.7	31	28.7	35	32.4	22.0	3.0	0.272	0.733
Issued Equity	215	100.0	9	4.2	73	34.0	82	38.1	23.4	3.1	0.092	1.071
Covered Operating Loss	128	59.5	4	3.1	60	46.9	64	50.0	23.6	2.9	0.084	1.079
Investment	87	40.5	5	5.7	13	14.9	18	20.7	23.2	3.5	0.104	1.058
Other Financing Activity	22	100.0	2	9.1	8	36.4	10	45.5	23.2	3.0	0.138	0.950
Covered Operating Loss	11	50.0	0	0.0	7	63.6	7	63.6	23.0	3.1	0.101	0.985
Investment	11	50.0	2	18.2	1	9.1	3	27.3	23.4	2.9	0.175	0.915

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	4.43	0.9366	0.3490
Covered Loss v. Invested Proceeds	27.06	5.8683	0.0000

Panel E: 1988, 1993, & 1998												
NCFF/TA = 10%	614	100.0	26	4.2	195	31.8	221	36.0	22.8	3.0	0.155	0.939
Issued Debt	279	100.0	13	4.7	92	33.0	105	37.6	22.3	2.8	0.230	0.803
Covered Operating Loss	121	43.4	7	5.8	54	44.6	61	50.4	22.7	2.6	0.202	0.831
Investment	158	56.6	6	3.8	38	24.1	44	27.8	22.0	3.0	0.250	0.781
Issued Equity	309	100.0	11	3.6	94	30.4	105	34.0	23.2	3.1	0.090	1.061
Covered Operating Loss	187	60.5	4	2.1	78	41.7	82	43.9	23.2	2.9	0.081	1.063
Investment	122	39.5	7	5.7	16	13.1	23	18.9	23.1	3.4	0.104	1.059
Other Financing Activity	26	100.0	2	7.7	9	34.6	11	42.3	23.1	2.9	0.124	0.943
Covered Operating Loss	14	53.8	0	0.0	8	57.1	8	57.1	23.1	2.9	0.086	0.975
Investment	12	46.2	2	16.7	1	8.3	3	25.0	23.1	3.0	0.167	0.906

Selected Test Statistics for the Difference between the Proportions of Firms that Delist for Performance

Comparison	Diff. (%)	Z-stat	p-value
Debt v. Equity Issuers	2.55	0.6651	0.5060
Covered Loss v. Invested Proceeds	24.64	6.5504	0.0000