Value relevance of restructuring charges in firms with varying levels of health.

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This study examines the usefulness of operational restructurings for companies restructuring for several different reasons, namely healthy companies restructuring to improve their efficiency and financially distressed firms restructuring to avoid filing for bankruptcy. Specifically, this paper examines the value relevance of restructuring charges for several different groups of restructuring firms. The hypotheses state that restructuring charges are value relevant and that the value relevance of restructuring charge information is smaller for non-distressed firms, greater for distressed firms that file for bankruptcy within three years of restructuring, and greatest for financially distressed firms that avoid filing for bankruptcy during the three years following the restructuring. The results demonstrate that the magnitude of corporate restructuring charges tends to provide value relevant information to investors. The dollar amount of a restructuring charge is determined to have a negative impact on returns for all firm-event observations. Both the restructuring and financial distress variables are highly significant and strongly support the research hypothesis that restructuring costs (financial distress) have positive (has negative) impact on prices and returns.

Keywords: value relevance, restructuring charge, financial distress, operational restructuring

INTRODUCTION

The purpose of this paper is to examine the value relevance of restructuring charges for several different groups of firms undergoing the process. Prior studies find that restructuring charges are value relevant (e.g., Bens 2002), and this paper further examines the value relevance of these charges for companies restructuring for different reasons. Specifically, the primary incremental contribution of this study is that it separately examines the value-relevance of restructuring charges for healthy firms utilizing the process to improve their efficiency and distressed firms restructuring to avoid bankruptcy filing.

The first section of this study discusses the importance of restructuring charges in determining a firm's stock price. In the second section, the hypotheses are developed. In the third section, the data set and the methodology utilized to test the hypotheses are discussed. The empirical results are described in the fourth section. Finally, the fifth section summarizes and draws conclusions.

IMPORTANCE OF RESTRUCTURING CHARGES

The research paradigm examined in this study is the value relevance of restructuring charges. Carter (1998) compares a sample of restructuring firms to a sample of similarly performing non-restructuring firms and finds that operating performance improves in firms during years three through five after a restructuring. Atiase et al. (2004) also document earnings improvements as a result of restructuring efforts while suggesting that restructuring efforts in the early nineties were not always successful. Conversely, Holder-Webb et al. (2005) find that there is not an improvement in operating performance as a result of a restructuring when expectations of firm and industry performance are controlled for.

Many studies have determined that restructuring charges have a positive impact on price, which further implies that restructuring charges are value relevant [Brickley and Van Drunen (1990), Martin and Kensinger (1990), Francis et al. (1996), Bunsis (1997), Ballester et al. (1999), and Kross et al. (2001)]. Lin (2009) finds that the individual components of restructuring efforts are value relevant and that the relevance of the components is impacted by the financial health of a firm during the restructuring year. However, some recent studies determine that restructuring charges may actually have a negative impact on price [Blackwell et al. (1990), Elliott and Hanna (1996), Carter (2000), Poon et al. (2001), Bens (2002), Holder-Webb et al. (2005)]. Bartov et al. (1997) demonstrate that even in cases where it is statistically significant, the market's reaction is very small for many prior studies. The mixed findings of these studies demonstrate the difficulty in interpreting the performance and market effects of an operational restructuring.

Other studies in the restructuring charge area examine the market's response to several components that typically comprise an operational restructuring plan. Blackwell et al. (1990) and Lin and Rozeff (1993) find negative market reactions to plant-closing announcements. Worrell et al. (1991), Lin and Rozeff (1993) and Elayan et al. (1998) find that the market reacts negatively to announcements of layoffs.[1] Francis et al. (1996) determine that the market reacts negatively to inventory write-offs. Jaggi et al. (2009) demonstrate that investors react positively

[1] Elayan et al. (1998) document that the market reaction to layoff announcements depends on many other factors including the size of the layoff, the industry of the firm, the information set available to shareholders, and the financial performance of the firm before the announcement. Worrell et al. (1991) determine that announcements of large or permanent layoffs result in stronger negative responses than other announcements.

to restructurings that include workforce reductions and plant closings.[2] Lopez (2002) determines that restructurings are multi-dimensional efforts that may require disaggregation into components for a complete understanding of their effect on the market.

John et al. (1992) examined firms' responses to losses, and they determine that firms were able to increase their focus and become more efficient after restructuring efforts. Smart and Waldfogel (1994) utilize a "surprise" variable to determine what would have happened at the restructuring firm in the absence of the restructuring. Therefore, this study will further examine the value relevance of restructuring charges to determine the reasons why the extant research contains studies with contradictory findings that the market reacts positively to restructuring charges and that the market reacts negatively to restructuring charges.

Further, this study examines the value relevance of restructuring charges for firms with varying levels of financial health. Khurana and Lippincott (2000) separately examine restructuring charges for firms posting losses. For the loss firms, the authors find that the restructuring charge is positive and highly significant. The level of earnings is not significant for loss firms, and the change in earnings is only slightly significant. The results for loss firms suggest that current losses are viewed as being temporary and not value-relevant, but restructuring activities are seen as having a permanent and positive effect on future performance. The authors further separate the restructuring firms into groups based on the primary purpose for the charge. The three main categories of reasons for taking restructuring charges are restructuring with the primary purpose of exiting a line of business, restructuring where the primary purpose is to eliminate personnel, and restructuring where the primary purpose cannot be discerned. The authors find that both of the first types of restructurings are positively associated with returns.[3] Furthermore, Jaggi et al (2009) demonstrate that investors react positively to restructurings aimed at improving firm performance and negatively to high magnitude restructuring charges at firms with financial difficulty.

Based partially on Khurana and Lippincott's (2000) findings for profit and loss firms, this study suggests that the value relevance of restructuring charge information for distressed firms restructuring to avoid bankruptcy is greater than the value relevance of restructuring charges for healthy firms restructuring to improve their efficiency. Because distressed firms have several different possible outcomes from restructuring, these groups of firms with different results during the three years after restructuring are examined separately. Distressed firms that avoid bankruptcy in the three years following a restructuring charge are likely to have had more well-developed, organized plans for their restructuring activities than firms that file for bankruptcy after restructuring. Therefore, this study predicts that the value relevance of restructuring charge information for distressed firms that are able to avoid filing for bankruptcy for at least three years after restructuring is greater than the value relevance of restructuring charge information for distressed firms that ultimately file for bankruptcy in the three years after restructuring.

HYPOTHESES DEVELOPMENT

[2] Jaggi et al. (2009) measure investor reaction using 12-month buy-and-hold abnormal returns.

[3] In January 1995, the EITF released EITF 94-3, which requires firms to record the costs of restructuring during the period in which management commits to the plan and to disclose many details about the restructuring plan. Also, costs classified as restructuring charges must provide no future benefit to the firm over and above the restructuring execution. EITF 94-3 was later nullified by SFAS No. 146.

The hypotheses examine the effect of restructuring charges on price. H1 and H2 examine the impact of restructuring charges on price in order to address the contradictory findings related to the value relevance of restructuring charges documented by prior studies including Kross et al. (2001), Bens (2002), and Holder-Webb et al. (2005). H3 examines the value relevance of restructuring charges for several different groups of restructuring firms to determine whether the charge has a different effect on price depending on a corporation's reason for restructuring. Based on prior studies, including the Khurana and Lippincott (2000) paper that separately examines value relevance for firms in different financial health categories, the predictions described in H3 are developed.

This prior literature leads to the three hypotheses stated as follows:

H1: Restructuring charges are value relevant and the stock market reacts positively to the magnitude of restructuring charges.

H2: The value relevance of restructuring charge information is smaller for non-distressed firms, greater for distressed firms that file for bankruptcy within three years of restructuring, and greatest for financially distressed firms that avoid filing for bankruptcy during the three years following the restructuring.

H3: Restructuring costs (financial distress) have positive (has negative) impact on price and returns.

METHODOLOGY

Prior to testing the hypotheses, it is necessary to create a sample of firms that have restructured. The full sample for this study contains data from 1992 to 2004 for firms undertaking operational restructuring efforts during the period from 1993 through 2003 that have data availability for the required variables. Equations 1 through 3 are used to determine whether or not each firm was in financial distress. In order to determine a "distress" value for each firm in the sample, this study uses Altman's (1968) original Z-score model and Begley et al.'s (1996) updated version of the Altman (1968) model.

Although the Altman (1968) and Begley (1996) models were originally intended as bankruptcy prediction models, Grice and Dugan (2001) indicate that bankruptcy prediction models like Altman's (1968) are actually more useful for identifying firms that are financially distressed, as opposed to identifying the more limited bankruptcy condition. Because these models have been proven successful, this study uses the linear Z-score equations and substitutes the numbers for each variable for the firms in the sample. These models are used to determine a distress value for each firm, and then a cutoff point can be used to classify firms as either distressed or healthy. Altman's (1968) Z-score model is as follows:

$$Z = 0.012\ X_1 + 0.014\ X_2 + 0.033\ X_3 + 0.006\ X_4 + 0.999\ X_5, \quad (1)$$

where

Z is used to determine whether each company is in financial distress[4],

X_1 is working capital divided by total assets * 100[5],

[4] All X-values are included in the calculation of Z for each firm or firm-event observation, even when the values are negative.

[5] Working capital divided by total assets is a measure of the net liquid assets of a firm relative to the overall capitalization; firms with losses are likely to also have shrinking current assets compared to total assets. Altman (1968) finds that working capital divided by total assets is the most valuable measure of the liquidity.

X_2 is retained earnings divided by total assets * 100[6],
X_3 is earnings before interest and taxes divided by total assets * 100[7],
X_4 is the market value of equity divided by the book value of debt * 100[8], and
X_5 is sales divided by total assets[9].

Begley et al. (1996) re-estimate Altman's (1968) model using data from the eighties, and their updated model is as follows:

$$Z = 0.104\ X_1 + 1.010\ X_2 + 0.106\ X_3 + 0.003\ X_4 + 0.169\ X_5, \quad (2)$$

using the same variables and variable definitions as Altman's (1968) model.

Altman (1968) finds that for his sample firms, firms with Z-scores greater than 2.99 were mostly not in financial distress and many of the firms with Z-scores less than 1.81 went bankrupt. Altman (1968) further finds that using a Z-score of 2.675 as a cutoff minimizes the number of firms that are misclassified by the model. Therefore, this study uses 2.675 as the cutoff point for the Altman (1968) model results. Begley et al. (1996) find that the most appropriate cutoff point for their model is 0.545. Firms with Z-scores less than 0.545 are classified as financially distressed and are assigned a value of 1, and firms with Z-scores greater than 0.545 are classified as being non-distressed and are assigned a value of 0.

After each firm is classified as either being financially distressed or non-distressed using the Altman (1968) model and the Begley et al. (1996) model, Ohlson's (1980) logistic regression model is used to confirm the accuracy of the classification procedure. Also, the results of the Ohlson logistic regression model provide a probability value between 0 and 1 for each firm that indicates the likelihood of a firm being in financial distress. These probability values are included as additional predictor variables in the price and return models. Ohlson's (1980) model is as follows:

$$DISTRESS_{i,t} = a_0 + a_1\ SIZE_{i,t} + a_2\ TLTA_{i,t} + a_3\ WCTA_{i,t} + a_4\ CLCA_{i,t} + a_5\ NITA_{i,t} + a_6\ FUTL + a_7\ INTWO_{i,t} + a_8\ OENEG_{i,t} + a_9\ CHIN + u_{i,t}, \quad (3)$$

where

DISTRESS equals 1 if a firm is determined to be in financial distress, 0 otherwise;
SIZE is the log of total assets;
TLTA is total liabilities divided by total assets;[10]
WCTA is working capital divided by total assets;[11]
CLCA equals current liabilities divided by current assets;
OENEG equals 1 if owners' equity is negative, 0 otherwise;[12]
NITA is net income divided by total assets;[13]

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[6] Retained earnings divided by total assets is included because it implicitly considers the age of a firm, and financial distress is much more common in the early years of a firm's life.

[7] Earnings before interest and taxes, divided by total assets is a measure of the true productivity of a firm's assets, ignoring tax and leverage factors. Because a firm's existence is based on the earning power of the firm's assets, this ratio is especially important.

[8] The market value of equity divided by book value of debt variable shows how much the firm's assets can decline in value before the firm becomes insolvent. Including the market value of equity divided by the book value of debt adds a market value dimension not considered before Altman (1968), and this variable is determined to be a better predictor of bankruptcy than net worth/total debt.

[9] Sales divided by total assets is a measure of firm size. Although Altman (1968) finds that sales divided by total assets is the least significant variable on its own, it is important to include this variable because of its unique relationship to the other variables to be included in the model.

[10] The variable TLTA is included as a measure of firm leverage.

[11] The variables WCTA and CLCA are included as measures of current liquidity.

[12] The variable OENEG is used as a discontinuity correction for TLTA.

FUTL is cash flows from operations divided by total liabilities;
INTWO equals 1 if net income was negative over the last two years, 0 otherwise;
CHIN = $(NI_t - NI_{t-1}) / (| NI_t | + | NI_{t-1} |)$.[14]

Ohlson's (1980) model includes nine explanatory variables, and all of them are included in this study even though Ohlson finds that only six of them are significant. The log of total assets, total liabilities divided by total assets, net income divided by total assets, cash flows from operations divided by total liabilities, FUTL, and CHIN are all significant predictors of bankruptcy in Ohlson's (1980) model.

The hypotheses in this study are tested by examining the value-relevance of restructuring charge information using two methods: associating stock returns with contemporaneous financial data and associating prices with financial data (Aboody and Lev 1998). Prior research (Ballester et al. 1999) has primarily found that prices tend to rise in response to restructuring, and therefore $RSTR_{i,t}$ and $RSTR_{i,t} / P_{i,t-1}$ in equations 4a and 5a, respectively, are expected to be positive and significant. The following regression models are used:

$$P_{i,t} = \sum a_0 C_t + a_1 BVPS_{i,t} + a_2 EPS_{i,t} + a_3 RSTR_{i,t} + u_{i,t} \quad (4a)$$

$$R_{i,t} = \sum b_0 C_t + b_1 EPS_{i,t} / P_{i,t-1} + b_2 \Delta EPS / P_{i,t-1} + b_3 RSTR_{i,t} / P_{i,t-1} + u_{i,t}, \quad (5a)$$

where

$P_{i,t}$ is firm i's monthly stock price three months after fiscal year-end;
C_t equals 1 if the observation is from year t, where t represents a year between 1993 and 2003, 0 otherwise;
BVPS is firm i's book value per share for year t;
EPS is firm i's earnings per share for year t;
RSTR is the dollar amount of restructuring charges scaled by the number of outstanding shares;
$R_{i,t}$ is the firm's annual stock return, which is calculated using the following, a simple return model (Strong 1992), and $R_t = (P_t - P_{t-1}) / P_{t-1}$, where R_t is current year returns, P_t is the price three months after fiscal year-end, and P_{t-1} is the price from the prior year;
ΔEPS is the change in earnings per share;
$P_{i,t-1}$ is the price at the beginning of period.

In addition, this study uses the following variations of equations 4a and 5a[15]:

$$P_{i,t} = \sum a_0 C_t + a_1 BVPS_{i,t} + a_2 EPS_{i,t} + a_3 RSTR_{i,t} + a_4 OHLSON\_PROB_{i,t} + u_{i,t} \quad (4b)$$

$$P_{i,t} = \sum a_0 C_t + a_1 BVPS_{i,t} + a_2 EPS_{i,t} + a_3 RSTR_{i,t} + a_4 DISTRESS_{i,t} + u_{i,t} \quad (4c)$$

$$R_{i,t} = \sum b_0 C_t + b_1 EPS_{i,t} / P_{i,t-1} + b_2 \Delta EPS / P_{i,t-1} + b_3 RSTR_{i,t} / P_{i,t-1} + b_4 OHLSON\_PROB_{i,t-1} + u_{i,t} \quad (5b)$$

$$R_{i,t} = \sum b_0 C_t + b_1 EPS_{i,t} / P_{i,t-1} + b_2 \Delta EPS / P_{i,t-1} + b_3 RSTR_{i,t} / P_{i,t-1} + b_4 DISTRESS_{i,t} + u_{i,t,} \quad (5c)$$

where

OHLSON_PROB is the probability of financial distress obtained from running Ohlson's logistic regression model shown in equation 3;
DISTRESS equals 1 for firms classified by the Altman (1968) and Begley (1996) model to be distressed, 0 otherwise.

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[13] NITA and FUTL are included as measures of firm performance.
[14] The CHIN variable is a measure of the change in net income and is included as suggested by McKibben (1972).
[15] See Aharony and Barniv (2004) for using a probability value measure to assess value relevance of accounting information in valuation models for mergers and acquisitions.

The three versions of equations 2.4 and 2.5 are estimated during the restructuring event year for all sample firms. Also, equations 4a and 5a are estimated separately for the financially healthy restructuring firms, for the firms in financial distress that did not subsequently file for bankruptcy, and for the firms in financial distress that did subsequently file. The results of the Ohlson logistic regression model in equation 3 provide a probability value between 0 and 1 for each firm that indicates the likelihood of a firm being in financial distress. These probability values are included in equations 4b and 5b above. The distress values assigned to each firm by using both the Altman (1968) and Begley (1996) models in equations 1 and 2 are included as additional explanatory variables in equations 4c and 5c above. Only firms classified as distressed or non-distressed by both models are included in the final sample.

DATA

The full sample for this study includes data for the period from 1992 to 2004 and firms announcing operational restructurings during the period from 1993 to 2003.[16] Financial and market data were obtained for this study from the COMPUSTAT database. Table 1 (Appendix) provides the steps used to arrive at the final sample of 1,562 firm-event observations obtained from 1,207 different firms.

As shown in Table 2 (Appendix), the sample is comprised primarily of manufacturing firms, with 58.6 percent of the sample firm-event observations coming from this category. The next largest sample group is service firms, which comprise 21.7 percent of the firm-event observations. The sample also contains smaller percentages of firm-events from the transportation, communication, gas and electric category, the wholesale and retail trade categories, and the financial, insurance, and real estate category.

EMPIRICAL RESULTS

Univariate Analysis

Table 3 (Appendix) provides the descriptive statistics obtained after the outliers are deleted for each variable for the full sample of firm-event observations. The mean (median) restructuring charge amount is $82.9 million ($10 million), which indicates that most of the companies in the sample are undergoing fairly significant restructuring efforts. The median values for EPS and BVPS are -$0.21 and $4.71 per share, respectively.

Value Relevance Across Three Types of Firms

To test hypothesis H1, the models shown in equations 4a and 5a are each estimated three times, once for the companies not in financial distress, once for the companies in financial distress that avoid bankruptcy for at least three years subsequent to restructuring, and once for the companies in financial distress that eventually file for bankruptcy. The results of regressions using firm observations are presented in Table 4 (Appendix).

The results of the regressions of equations 4a and 5a for the three health conditions classified the same by the Altman and Begley models are presented in Table 4 (Appendix). Panel A of Table 4 (Appendix) includes the results for the estimations of equation 4a, the price

[16] Because one variable requires data from period t-1, some 1992 data are also used.

model.[17] The three columns in each panel provide the results for the non-distressed firms, the distressed and non-bankrupt firms, and the distressed and bankrupt firms. The price models for the non-distressed group, the distressed and non-bankrupt group, and the distressed and bankrupt group have R-square values of 0.44, 0.10 and 0.30, respectively. The higher R-square for the non-distressed firms indicate that book value per share, earnings per share, and charge per share are more value relevant to price for non-distressed firms. Overall, the results of the price models in Panel A support H2.

For the price models in Panel A of Table 4 (Appendix), the earnings per share coefficient is positive and significant for the non-distressed group of firms and negative and significant for the distressed, non-bankrupt firms. The coefficient on book value per share is positive and significant for the non-distressed firms and the distressed and non-bankrupt firms. The coefficient for restructuring charge per share is positive and significant for the two groups of distressed firms. This suggests that when price models are used, restructuring charge dollar amounts provide positive value-relevant information to investors for distressed firms when firm-event observations are examined. The results also support H2 and Khurana and Lippincott's (2000) findings. The Chow Test is used to demonstrate that the variables in the models are significantly different across the three groups, and the Chow F-values shown in Panel A of Table 4 (Appendix) are significant.

Panel B of Table 4 (Appendix) provides the results of the estimation of equation 5a, the returns regression model, when firm-event observations are used. The return models for the non-distressed group, the distressed and non-bankrupt group, and the distressed and bankrupt group have R-square values of 0.14, 0.31, and 0.30, respectively. The higher R-square for the distressed firms indicate that book value per share, earnings per share, and charge per share are more value relevant for distressed firms when the results of returns models are examined.[18]

The results in Panel B of Table 4 (Appendix) demonstrate that the coefficient on the variable of interest, charge per share, is negative and significant for all three groups of firms for the returns model. This indicates that restructuring charge information is value relevant for returns models and that returns decrease as the dollar amount of the restructuring charge per share increases. The significance of the restructuring charge variable provides support for hypothesis H1 and H2. The negative and significant coefficient on the restructuring charge variable using the returns model confirms Khurana and Lippincott's (2000) expectations for the healthy firms. However, the negative and significant coefficient for the restructuring charge variable for the two groups of distressed firms is contrary to expectations and to the findings of Khurana and Lippincott (2000). The significant Chow F-values in Panel B of Table 4 (Appendix) show that there are significant differences across the hypotheses between the impact

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[17] The price and return models in the remainder of the study were all tested for various specification problems including multicollinearity, heteroscedasticity, and autocorrelation, and the problems were corrected whenever they were found. For example, the test for multicollinearity examined variance inflation factors to ensure that they were less than 5 and by confirming that there are not high pair-wise simple correlations among regressors. Although there were a few relatively high correlations among the regressors for the price and return models used, the VIF factors are in all cases below 5. The test for heteroscedasticity and autocorrelation used White's chi-square test and Durbin-Watson statistics, respectively.

[18] The earnings per share variable is negative and significant for the non-distressed firms, which indicates that as the level of earnings per share decreases, the level of returns increases for healthy firms. The change in earnings per share variable is positive and significant for all three groups of firms, which indicates that as the change in earnings per share increases, the level of returns also increases.

of the independent variables on price and returns. Overall, the results in Table 4 (Appendix) provide support for H1 and H2.

The Effect of Restructuring Charges and the Likelihood of Financial Distress

The next tables are used to test H3, focusing on the joint impact of the magnitude of restructuring charges and the likelihood of financial distress on price and returns. Table 5 (Appendix) provides the price model results when several alternative specifications for equation 2.4 are run. The results in the first column of Table 5 (Appendix) show that the R-squared value for the price model is 0.392. The coefficient on earnings per share is positive and significant in each model, which suggests that price increases as earnings per share increases. The coefficient on the restructuring variable is also positive and significant for all the models in Table 5 (Appendix), which suggests that restructuring charges are value relevant when price models are examined and that price increases in response to the magnitude of the restructuring charge.

In the second column of Table 5 (Appendix), the Ohlson probability value (OHLSON_PROB) obtained from equation 3 is included as an independent variable in the price model. As expected, the coefficient of the OHLSON_PROB variable is negative and highly significant. The significant, negative coefficient on the OHLSON_PROB variable indicates that, as expected, firm value declines as the probability of financial distress increases. Also, the strong significance and the negative sign of the OHLSON_PROB variable for the price model indicate that firm value is inversely related to the likelihood of distress. It is also important to note that the adjusted R-square value improves slightly to 0.418 when the OHLSON_PROB variable is included in the model, indicating an improvement to the basic price model. In the third column of Table 5 (Appendix), the dummy variable indicating the health classification from the Altman and Begley models is included in equation 2.4. The R-square value for the third column is slightly higher than the value when the OHLSON_PROB variable is included in the model. The coefficient on the DISTRESS dummy variable is negative and significant, which suggests that price decreases as the likelihood of financial distress increases. Overall, the results in Table 5 (Appendix) demonstrate that the dollar amount of restructuring charges is value relevant when price models are examined using firm observations.

Table 6 (Appendix) provides the return model results for several alternative specifications for equation 2.5. The R-square values are lower than the corresponding R-square value from the price model. The coefficient on the charge per share variable is negative and significant for all the versions of the returns model. These results in Table 6 (Appendix) demonstrate that the dollar amount of restructuring charges is value relevant when returns models are examined for all sample firm-event observations and that firm value decreases as restructuring charge per share increases. The earnings per share variable lacks significance for all versions of equation 2.5.

In the second column of Table 6 (Appendix), the Ohlson distress probability value (OHLSON_PROB) obtained from equation 3 is included as an additional independent variable. The coefficient on the OHLSON_PROB variable is negative and significant. The strong significance and the negative sign of the OHLSON_PROB variable for the returns model indicate that firm value declines as the likelihood of distress increases. In the third column of Table 6 (Appendix), instead of including the OHLSON_PROB variable, the dummy variable indicating the health classification from the Altman and Begley models is included in equation 2.4. The coefficient on this DISTRESS dummy variable is also negative and significant, which

indicates that returns decrease as financial health declines. Comparing the adjusted R-square values indicates that the best specified model is the one that includes the DISTRESS dummy variable as an additional explanatory variable in the return model. Overall, the results reported in Table 6 (Appendix) support H3. In particular, the findings provide strong support for the negative impact of the likelihood of financial distress on price and returns.

Robustness Tests

To determine potential problems because of model specification and OLS assumptions, this study also examines potential problems with autocorrelation, multicollinearity, and heteroscedasticity. An examination of the Durbin-Watson statistics indicates that there is no autocorrelation of the residuals. It seems that there is no major problem with multicollinearity because there are no high correlations between the independent variables. Although a few pairwise correlations between the coefficients for the price and returns models are fairly high, the variance inflation factors (VIFs) are below two for most variables and are below five for all of the variables, which roughly indicates that there is no material multicollinearity problem. An examination of the White's Chi-squared statistic for the models indicated that there were initially some heteroscedasticity problems, so White-adjusted t-statistics are calculated and reported for all regressions.

CONCLUSIONS

The results of this study demonstrate that the dollar amount of corporate restructuring charges provide value relevant information to investors when both price and return models are used, which supports H1. As expected, earnings per share, book value per share, and the change in earnings per share provide value relevant information to the market for most of the samples. Also, the value relevance of restructuring charge information is determined to be smaller for firms that are not financially distressed, greater for financially distressed firms that file for bankruptcy during the three years following the restructuring, and greatest for firms in distress that do not file for bankruptcy in the three years subsequent to the restructuring. Thus, the results also provide support for H2.

This information may have implications for investors and analysts as they determine how they should react to restructuring charge information. The results further indicate that firm value declines as the probability of financial distress increases. Statistical tests also demonstrate that the dollar amount of restructuring charges is value relevant to investors for all firms based on the results of the price model. Finally, the results reported in Table 6 (Appendix) support H3.

Several limitations of this study should be noted. First, future research may be able to improve the process for obtaining a better list of restructuring firms. Because the initial list of restructuring firms used in this study was obtained through a key word search of the newswires available on the Lexis-Nexis Database, it is possible that some restructuring firms were left out of the sample. If an announcement of the restructuring did not take place on a newswire, then it may have been inadvertently left out the sample. Perhaps by examining all the 10-Ks and 8-Ks of firms with special item dollar amounts available on COMPUSTAT, fewer firms that potentially have taken restructuring charges would have been eliminated from the sample. More detailed data on restructuring charge amounts could be obtained from COMPUSTAT for firm-years after 2001. Second, the results may be adversely affected by including some companies

that restructured during multiple years as firm-event observations, which is why the results are also reported using firms that have restructured only once during the research period. Third, another limitation of this study is the "ad-hoc" statistical identification of healthy versus financially distressed firms. Finally, this study is subject to potential criticism on price and return models. This includes the efficient market explanation that the restructuring is already impounded in prices. The empirical results of the price models tend to suggest the potential existence of this limitation.

Some of the limitations of this study can be addressed in future research. For example, the sample could be expanded to include firms restructuring in a more recent period. Increasing the sample period would increase the overall sample size and the number of firms in financial distress that file for bankruptcy within three years of restructuring. Further statistical comparisons can be made between the value relevance of restructuring charge information for the sub-samples examined. Future studies may be able to improve upon the method used to determine which firms are healthy and which firms are distressed. For example, Jaggi et al. (2009) measure firm health using the change in operating performance, measured by adjusted return on equity, over the two year period after restructuring. Also, future research can extend the results of this study by determining whether the results of this study are generalizable to other time periods or to specific industries or analyzing repeated restructurings by the same firms (for example, see Lin and Yang 2006).

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TABLE 1
Final Sample Determination[1]

Firm-Event Observations	Number of Firm-Event Observations
Sample firm-event observations announcing restructuring from 1993 through 2003	3,867
Observations with missing data (IBES and Compustat)	(1,627)
Less outliers deleted	(38)
Less firm-event observations not classified into the same health category by Altman (1968) and Begley (1996)	(522)
Final number of firm-event observations included in this study	1,562

TABLE 2

SIC Division	**# of Firm-Event Observations**	**Firm-Event Observations as % of Total**
Agriculture, Forestry, and Fishing	1	0.1
Mining	22	1.4
Construction	350	22.4
Manufacturing	585	37.5
Transportation, Communications, Electric, & Gas	72	4.6
Wholesale Trade	163	10.4
Retail Trade	21	1.3
Finance, Insurance, and Real Estate	276	17.7
Services	69	4.4
Public Administration	3	0.2
Total	**1,562**	

[1] Several firms completed more than one operational restructuring over the period from 1993 through 2003; the firms are included more than once in the sample as different firm-event observations.

TABLE 3: Descriptive Statistics[2]						
Variable	**N**	**Mean**	**Median**	**Std. Dev.**	**Minimum**	**Maximum**
Price Model Variables:						
$BVPS_{i,t}$ ($)	1,562	6.09	4.71	7.53	-37.18	55.63
$EPS_{i,t}$ ($)	1,562	-1.05	-0.21	4.55	-58.62	16.10
Charge Amount ($Millions)	1,562	82.90	10.00	419.1	0.07	8,000.0
$P_{i,t}$ ($)	1,562	16.54	10.13	34.06	0.01	884.4
Return Model Variables:						
$R_{i,t}$ (%)	1,562	0.06	-0.05	0.83	-0.97	8.23
$RSTR_{i,t}$ ($)	1,562	1.17	0.34	6.93	0.002	199.3
$P_{i,t-1}$ ($)	1,562	19.82	11.38	54.85	0.01	1,625.0
$EPS_{i,t} / P_{i,t-1}$	1,528	-0.24	-0.02	0.76	-10.24	1.62
$\Delta EPS / P_{i,t-1}$	1,528	0.17	-0.01	1.77	-3.90	32.23
$RSTR_{i,t} / P_{i,t-1}$	1,528	0.24	0.04	1.80	<0.001	56.06
Financial Health Variables:						
OHLSON_PROB	1,540	0.45	0.27	0.39	0	1
DISTRESS	1,562	0.46	0	0.50	0	1

[2] $P_{i,t}$ is the share price three months after fiscal year end. $BVPS_{i,t}$ is book value per share. $EPS_{i,t}$ is earnings per share. $RSTR_{i,t}$ is the dollar amount of restructuring charges per common share outstanding. $R_{i,t}$ is simple returns calculated using the equation $R_t = (P_t - P_{t-1}) / P_{t-1}$. $P_{i,t-1}$ is the price three months after fiscal year end from the previous year. ΔEPS is the change in earnings per share between year t-1 and year t. OHLSON_PROB is the probability of financial distress obtained from running Ohlson's regression model (equation 3). DISTRESS equals 1 for firms classified by both Altman and Begley as distressed, and 0 otherwise. The sample in this table includes only observations classified into the same distress classification (0 or 1) by the Altman (1968) and Begley (1996) models.

TABLE 4: Price and Return Model Regressions:[3]
Firm-Event Observations[4]

Panel A: OLS Regressions of Equation 1a: Price Model[5]

(4a) $P_{i,t} = \sum a_0 C_t + a_1 BVPS_{i,t} + a_2 EPS_{i,t} + a_3 RSTR_{i,t} + u_{i,t}$

Variable Name (Expected Sign)[6]	Non-Distressed Coefficients	Distressed and Non-Bankrupt Coefficients	Distressed and Bankrupt Coefficients
BVPS (+/-)	1.897	0.318	-0.025
(t-statistic)	(7.61***)	(3.51***)	(-0.25)
EPS (+/-)	1.695	-0.161	-0.110
	(3.27***)	(-1.85*)	(-0.91)
Charge Per Share (+/-)	0.359	0.269	1.951
	(1.08)	(1.47)	(2.56**)
Adjusted R^2	0.442	0.103	0.304
N	853 firm-event observations	622 firm-event observations	87 firm-event observations
F-value	52.90***	6.50***	4.12***

Chow Test Results for Price Model for Firm-Event Observations

	Non-Distressed vs. Distressed, Non-Bankrupt	Non-Distressed vs. Distressed, Bankrupt	Distressed, Non-Bankrupt vs. Distressed, Bankrupt
F-value	80.71***	18.32***	4.91***

[3] The coefficients on the yearly intercepts are not reported. The coefficients are negative and significant.
[4] The data has been trimmed to delete the top and bottom one percent of the observations. The sample in this table includes only observations classified into the same distress classification (0 or 1) by the Altman (1968) and Begley (1996) models.
[5] $P_{i,t}$ is the share price three months after fiscal year end, $BVPS_{i,t}$ is book value per share, $EPS_{i,t}$ is earnings per share, and $RSTR_{i,t}$ is the dollar amount of restructuring charges per common share outstanding. Corrections for heteroscedasticity, multicollinearity, and autocorrelation are made whenever problems are detected.
[6] The White adjusted t-statistics are shown in parentheses.
***Significant at the 0.01 level; **Significant at the 0.05 level; *Significant at the 0.10 level

TABLE 4: Price and Return Model Regressions:[7]
Firm-Event Observations[8]

Panel B: OLS Regressions of Equation 5a: Return Model[9]

(5a) $R_{i,t} = \sum b_0 C_t + b_1 EPS_{i,t} / P_{i,t-1} + b_2 \Delta EPS / P_{i,t-1} + b_3 RSTR_{i,t} / P_{i,t-1} + u_{i,t}$

Variable Name (Expected Sign)[10]	Non-Distressed Coefficients	Distressed and Non-Bankrupt Coefficients	Distressed and Bankrupt Coefficients
$EPS/P_{i,t-1}$ (+/-)	-1.195	-0.037	0.022
(t-statistic)	(-2.75***)	(-0.80)	(0.54)
Change in $EPS/P_{i,t-1}$ (+/-)	1.200	0.057	0.020
	(3.26***)	(2.86***)	(0.66)
Charge Per Share/$P_{i,t-1}$ (+/-)	-0.846	-0.119	-0.070
	(-3.05***)	(-3.52***)	(-2.06**)
Adjusted R^2	0.136	0.311	0.298
N	846	600	77
F-value	11.20***	21.83***	3.70***

Chow Test Results for Price Model for Firm-Event Observations

	Non-Distressed vs. Distressed, Non-Bankrupt	Non-Distressed vs. Distressed, Bankrupt	Distressed, Non-Bankrupt vs. Distressed, Bankrupt
F-value	10.17***	24.76***	115.1***

[7] The coefficients on the yearly intercepts are not reported.
[8] The data has been trimmed to delete the top and bottom one percent of the observations. The sample in this table includes only observations classified into the same distress classification (0 or 1) by the Altman (1968) and Begley (1996) models.
[9] $RSTR_{i,t}$ is the dollar amount of restructuring charges per common share outstanding. $R_{i,t}$ is simple returns calculated using the equation $R_t = (P_t - P_{t-1}) / P_{t-1}$, $P_{i,t-1}$ is the price three months after fiscal year end from the previous year, ΔEPS is the change in earnings per share between year t-1 and year t, and the other variables are as previously described. Corrections for heteroscedasticity, multicollinearity, and autocorrelation are made if problems are detected.
[10] The White adjusted t-statistics are shown in parentheses.
***Significant at the 0.01 level; **Significant at the 0.05 level; *Significant at the 0.10 level

TABLE 5[11]
Regressions of the Price Model (Equation 2.4)[12]
Firm-Event Observations

(4a) $P_{i,t} = \sum a_0 C_t + a_1 BVPS_{i,t} + a_2 EPS_{i,t} + a_3 RSTR_{i,t} + u_{i,t}$
(4b) $P_{i,t} = \sum a_0 C_t + a_1 BVPS_{i,t} + a_2 EPS_{i,t} + a_3 RSTR_{i,t} + a_4 OHLSON\_PROB_{i,t} + u_{i,t}$
(4c) $P_{i,t} = \sum a_0 C_t + a_1 BVPS_{i,t} + a_2 EPS_{i,t} + a_3 RSTR_{i,t} + a_4 DISTRESS_{i,t} + u_{i,t}$

Variable Name (Expected Sign) [13]	**Equation 4a**	**Equation 4b**	**Equation 4c**
BVPS (+)	1.399	1.144	1.199
(t-statistic)	(9.43***)	(5.66***)	(6.69***)
EPS (+)	0.508	0.218	0.282
	(3.10***)	(1.22)	(1.72*)
RSTR (+)	0.512	0.529	0.519
	(1.86*)	(1.91*)	(1.91*)
OHLSON_PROB (-)		-10.215	
		(-4.43***)	
DISTRESS (-)			-7.547
			(-5.59***)
Adjusted R^2	0.392	0.418	0.420
N	1,562	1,540	1,562
F-value	78.57***	80.05***	81.653***

[11] $P_{i,t}$ is the share price three months after fiscal year end, $BVPS_{i,t}$ is book value per share, $EPS_{i,t}$ is earnings per share, and $RSTR_{i,t}$ is the dollar amount of restructuring charges per common share outstanding. OHLSON_PROB is the probability of financial distress obtained from running Ohlson's regression model (equation 3). DISTRESS equals 1 for firms classified by both Altman and Begley as distressed, and 0 otherwise. Corrections for heteroscedasticity, multicollinearity, and autocorrelation are made whenever problems are detected. The data has been trimmed to delete the top and bottom one percent of the observations. The sample in this table includes only observations classified into the same distress classification (0 or 1) by the Altman (1968) and Begley (1996) models.
[12] The coefficients on the yearly intercepts are not reported.
[13] The White adjusted t-statistics are shown in parentheses.
***Significant at the 0.01 level; **Significant at the 0.05 level; *Significant at the 0.10 level

TABLE 6[14]
Regressions of the Return Model (Equation 2.5)
Firm-Event Observations[15]

(5a) $R_{i,t} = \sum b_0 C_t + b_1 EPS_{i,t} / P_{i,t-1} + b_2 \Delta EPS / P_{i,t-1} + b_3 RSTR_{i,t} / P_{i,t-1} + u_{i,t}$

(5b) $R_{i,t} = \sum b_0 C_t + b_1 EPS_{i,t} / P_{i,t-1} + b_2 \Delta EPS / P_{i,t-1} + b_3 RSTR_{i,t} / P_{i,t-1} + b_4 OHLSON\_PROB_{i,t-1} + u_{i,t}$

(5c) $R_{i,t} = \sum b_0 C_t + b_1 EPS_{i,t} / P_{i,t-1} + b_2 \Delta EPS / P_{i,t-1} + b_3 RSTR_{i,t} / P_{i,t-1} + b_4 DISTRESS_{i,t} + u_{i,t}$

Variable Name (Expected Sign)[16]	**Equation 5a**	**Equation 5b**	**Equation 5c**
$EPS/P_{i,t-1}$ (+/-)	0.025	-0.027	-0.037
(t-statistic)	(0.74)	(-0.70)	(-0.86)
Change in $EPS/P_{i,t-1}$ (+/-)	0.061	0.064	0.064
	(3.29***)	(3.24***)	(3.22***)
Charge Per Share/$P_{i,t-1}$ (+/-)	-0.150	-0.142	-0.139
	(-5.73***)	(-6.01***)	(-6.11***)
OHLSON_PROB (-)		-0.238	
		(-4.34***)	
$DISTRESS_{i,t}$ (-)			-0.255
			(-6.37***)
Adjusted R^2	0.202	0.214	0.224
N	1,528	1,513	1,513
F-value	30.67***	30.36***	32.13***

[14] $RSTR_{i,t}$ is the dollar amount of restructuring charges per common share outstanding. $R_{i,t}$ is simple returns calculated using the equation $R_t = (P_t - P_{t-1}) / P_{t-1}$, $P_{i,t-1}$ is the price three months after fiscal year end from the previous year, ΔEPS is the change in earnings per share between year t-1 and year t, and the other variables are as previously described. OHLSON_PROB is the probability of financial distress obtained from running Ohlson's regression model (equation 3). DISTRESS equals 1 for firms classified by both Altman and Begley as distressed, and 0 otherwise. Corrections for heteroscedasticity, multicollinearity, and autocorrelation are made whenever problems are detected. The data has been trimmed to delete the top and bottom one percent of the observations. The sample in this table includes only observations classified into the same distress classification (0 or 1) by the Altman (1968) and Begley (1996) models.

[15] The coefficients on the yearly intercepts are not reported. The coefficients were all negative and significant.

[16] The White adjusted t-statistics are shown in parentheses.

***Significant at the 0.01 level; **Significant at the 0.05 level; *Significant at the 0.10 level