

The Role that Fraud has on Bankruptcy and Bankruptcy Emergence

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I. INTRODUCTION

News media and academic research have produced many accounts of corporate fraud and accounting scandals which culminate in bankruptcy. The cases of Enron, Worldcom, Delphi, and the long list of other corporate collapses document a corporate America beset by deception and false accounting that is followed by bankruptcy and loss of value. The costs of these corporate failures are borne by many stakeholders including shareholders, creditors, employees, suppliers, customers, and society. In many cases, the cost to non-shareholders can dwarf that suffered by shareholders. Once a firm files bankruptcy the loss to stakeholders can be amplified if the bankrupt firm cannot successfully reorganize and is forced to liquidate. Accordingly, this paper is concerned with the association between fraud and bankruptcy filings and a firm's ability to reorganize and emerge from bankruptcy.

Managers engage in fraudulent financial reporting for two primary reasons. The first reasons would be the manager's personal gain, such as reporting better results before stock issuances, reporting results in line with analyst forecasts (or prior years) to avoid decline in stock prices, and manipulating results to increase managers' bonuses, stock options, etc. The second reason is to mask financial distress in order to avoid going concern modifications of audit opinions, debt covenant violations, and bankruptcy. Since most bankruptcies are adversarial, whereby stakeholders attempt to force changes in management and/or management's business plan, managers have incentives to take actions, such as fraudulent financial reporting, that may

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delay or avoid bankruptcy. This relationship between fraud and bankruptcy is of interest because bankruptcy's impact extends beyond investors, and ultimately harming all stakeholders.

Intuitively, there is a positive relation between financial reporting fraud and bankruptcy. Accordingly, one of our primary research questions is to formally examine whether such a relation exists. Such a finding would provide additional evidence that managers manipulate financial information in an attempt to avoid or delay bankruptcy. In the cases where these managers' actions are unsuccessful in avoiding bankruptcy, fraudulent financial reporting will be positively associated with bankruptcy filings. If, however, the fraudulent reporting is conducted for reasons other than masking financial distress (e.g., padding the financial results for subsequent stock issues), then it will less likely be related to bankruptcy.¹

If managers of financially distressed firms mask their poor financial results, then stakeholders may lack the ability to force these financially stressed firms into bankruptcy in a timely manner, while there is still time to prevent further deterioration in the firms' asset base. Bryan *et al.* (2012) provide evidence that firms will engage in manipulative actions, such as auditor switching or earnings management, in an ongoing attempt to cover up deteriorating financial conditions, and these firms are less likely to emerge from bankruptcy. The authors conclude that these actions will likely have delayed the bankruptcy process, depleting the firms' assets and, thus, impeding the opportunity to avoid liquidation. Similarly, the actions of firms that fraudulently report financial information prior to bankruptcy filing are even more extreme. Therefore, these fraudulent firms are probably more likely to have depleted their assets resulting in a lower likelihood to avoid liquidation.

¹ By restricting our tests to firms that filed bankruptcies, we can focus on managers' fraudulent manipulations of financial information intended to mask the firms' problems, such as avoiding the consequences of financial distress, and mitigate the influence of the other possible explanations for fraudulent reporting, such as subsequent stock issues, bonus incentives, etc.

Consequently, our second research question is whether fraudulent reporting by firms that subsequently filed bankruptcy affects the firms' ability to emerge from bankruptcy. If the fraudulent behavior of managers is unsuccessful in avoiding bankruptcy, but temporarily conceals the financial problems and delays the ability of creditors or other stakeholders to force the firm into bankruptcy sufficiently early, then the delay could further deplete a firm's assets and ultimately result in liquidation. Hence, we predict that fraud will be negatively associated with bankruptcy emergence. If, however, the fraud does not sufficiently delay the creditors' ability to force bankruptcy, then the fraud will have little effect on bankruptcy emergence.

Our results indicate that fraud is positively associated with bankruptcy filings, indicative of fraudulent reporting being used by managers as attempts to avoid or delay bankruptcy. Additionally, consistent with our predictions, we find that the firms that start the fraudulent reporting several years prior to bankruptcy are negatively associated with bankruptcy emergence. Taken together, these results suggest that managers engage in fraudulent actions to avoid or delay bankruptcy, and that these actions decrease the ability of the firm to emerge from bankruptcy. We expect this finding to be of great interest to stakeholders, auditors and the Public Company Accounting Oversight Board (PCAOB).

The next section provides a review of related literature. Section three presents our test model and hypotheses. Section four describes our sample selection criteria and empirical measures. Section five presents our empirical results and section six concludes the study.

II. REVIEW OF RELEVANT LITERATURE

An extensive amount of prior research has been conducted to investigate the types of entities, financial variables, and other information that are indicative of bankruptcy, fraudulent financial reporting (or subsequent SEC enforcement), and bankruptcy emergence. In this section, we briefly review the key findings of these research areas.

Bankruptcy Research

Prior bankruptcy research has generally focused on predicting which firms will file for bankruptcy protection. One of the more popular and robust accounting-based bankruptcy prediction models is Altman's Z-score (Altman 1968), which uses discriminant analysis to combine five ratios into a score that represents a firm's financial strength; this score is then used to predict bankruptcy. Subsequent papers including Ohlson (1980), Zmijewski (1984), Begley *et al.* (1996), Shumway (2001), Hillegeist *et al.* (2004) and others expand this line of research showing that the accounting information available in the 12 months prior to a bankruptcy filing predicts whether a firm will file for Chapter 11 protection. Additionally, Kane *et al.* (1998) find that bankruptcy prediction models are improved by transforming financial ratios into ranks, while Hopwood *et al.* (1994) show that these models are more effective for firms experiencing financial distress (i.e., those firms more likely to receive a going concern opinion). Kane *et al.* (1996) and Richardson *et al.* (1998) further demonstrate that these bankruptcy models can be improved by considering whether the filing occurred during a recessionary period.

Research utilizing more-sophisticated, non-linear function-based models also has been conducted. Davalos *et al.* (2009) use Genetic Algorithms to develop a model to classify fraudulent firms as bankrupt or non-bankrupt. Other studies find that artificial neural networks (ANNs) are generally better than logistic and linear models for bankruptcy prediction. For

example, Guoqiang *et al.* (1999) find that the ANN model is more accurate than the logistic regression model for large sample size. Altman *et al.* (1994), however, in their study of Italian companies, find that the methods are comparable. The authors also point out that ANNs have some drawbacks, such as using a “black box” approach to solve problems, whereby the internal processes and operations of the model are difficult to decipher (e.g., assessing the significance of financial variables). Thus, practitioners have reverted to building more meaningful and interpretable models, such as linear discriminant analysis.

Fraud and Bankruptcy Research

These bankruptcy prediction models typically use financial information that summarizes a firm’s overall performance and financial condition, with the goal of determining whether the firm is distressed or not. A few papers such as Lensberg *et al.* (2006) also include some fraud risk factors in addition to the financial variables. In times of distress, to enhance the firm’s true performance and avoid or delay bankruptcy, managers have incentives to apply “window dressing” which, in its extreme, becomes fraudulent financial reporting... Leach and Newson (2007) examine bankrupt firms and find that they manage earnings upward leading up to bankruptcy and reverse earnings management prior to filing when bankruptcy is imminent. However, they also find that fraudulent firms do not reverse the earnings management. Similarly, Rosner (2003) finds that non going-concern distressed firms’ pre-bankruptcy financial statements exhibit greater income-increasing accruals than control firms. She also finds that the accrual behavior of these firms resemble those of fraud firms that receive SEC sanctions for fraud. Accordingly, management’s fraudulent behavior can be a sign of distress and thus an indicator of future bankruptcy. Little research, however, has examined the direct impact of fraud

on bankruptcy. One goal of this paper is to add to this body of research by examining directly this relation of fraud and bankruptcy.

Bankruptcy Emergence Research

White (1984), Casey *et al.* (1986), Campbell (1996) and Bryan *et al.* (2002, 2012) extend the traditional bankruptcy studies to consider whether the accounting information that predicts bankruptcy filings is also associated with bankruptcy emergence. These studies focus on the post-bankruptcy filing period because, for those firms in bankruptcy, the question is no longer whether a firm will *declare* bankruptcy, but whether a firm will *emerge* from bankruptcy.

This line of research has shown a relation between the accounting information released in the year prior to filing for Chapter 11 reorganization and the ultimate success or failure of that reorganization. While the results have been mixed across bankruptcy emergence studies, these studies find that firms that emerge tend to be larger, more solvent and more liquid, and tend to have stronger earnings prospects and more free (non-collateralized) assets.

If management uses fraudulent financial reporting that delays bankruptcy, then these actions will result in a firm entering bankruptcy in a worse financial position. Consequently, the delay in filing for bankruptcy will reduce the ability of the firm to successfully emerge. Therefore, management's fraudulent behavior can reduce a firm's ability to emerge from bankruptcy which leads to our second goal of this paper to examine the relation of fraud and bankruptcy emergence.

III. MODEL AND HYPOTHESIS DEVELOPMENT

In this section, we develop our test models and formally state our hypotheses, which are that 1) fraudulent financial reporting will be positively associated with bankruptcy, and 2) fraudulent reporting of bankrupt firms will be negatively associated with bankruptcy emergence.

Bankruptcy Model

For our first model and hypothesis, we match each bankrupt firm with a single, non-bankrupt firm, based on the following three criteria: bankruptcy year, industry, and beginning of the year total assets, which is a proxy for firm size. We then create an indicator (0, 1) variable, *BANKRUPTCY_j*, to serve as the dependent variable in our tests. We set *BANKRUPTCY_j* equal to one if the firm filed for Chapter 11 of the bankruptcy code; otherwise, *BANKRUPTCY_j* is set to zero.²

We also create an additional indicator (0, 1) variable to test our first prediction. We create the indicator (0, 1) variable, *FRAUD_j*, that we set to one if the firm receives an Accounting and Auditing Enforcement Release (AAER) issued by the Security and Exchange Commission (SEC) where the first year of the fraud period is within five years of the firm's bankruptcy filing; otherwise, the number is set to zero. To test for the effects that fraud has on bankruptcy, we include this indicator variable in the model. Because there is little precedent on the time between

² We focus on Chapter 11 because it provides an opportunity to investigate a firm's ability to emerge from bankruptcy, our second hypothesis. This feature does not exist in Chapter 7 bankruptcies, which require a company to cease operations and liquidate.

the start of fraud and subsequent bankruptcy filing, we retest our models by extending the $FRAUD_j$ variable to the initiation of fraud beginning within six and seven years.³

Following prior research (Shumway (2001), Parker *et al.* (2002), Uhrig-Homburg (2005), Campbell *et al.* (2008), Eberhart *et al.* (2008)), we include several controls identified as determinants of bankruptcy risk. We include the leverage ratio (LEV_j), return on assets (ROA_j), firm size ($Ln(MV)_j$), liquidity ($CASH_j$), change in liquidity ($\Delta CASH_j$), intensity in research and development ($INTRD_j$), and an indicator (0, 1) variable for loss firms ($LOSS_j$). Consistent with prior research, we expect higher bankruptcy risk to be associated with leverage and loss, and a lower bankruptcy risk to be associated with return on assets, firm size, liquidity, and increase in liquidity. Following Ohlson (1980), if a firm's fiscal year-end occurred within three months of the bankruptcy filing, then we calculate our variables using the previous year's financial statements. The resulting logistic regression equation on the following page serves as our test model:

³ There is no precedent from prior literature on the time period fraud commences prior to bankruptcy. For our sample of 1,006 bankrupt firms, one firm started fraud within the year prior, 13 in two years prior, 11 in three years prior, five in four years prior, ten in five years prior, four in six years prior, three in seven years prior and six in eight years prior to bankruptcy. After eight years, the numbers taper off and are not that different between the bankrupt and non-bankrupt firms. For our initial test, we start with frauds that begin within five years prior to bankruptcy. However, we also examine fraud firms that have their first year of fraud within six and seven years of filing for bankruptcy.

$$\begin{aligned} Bankruptcy_j = & \alpha_0 + \alpha_1 LEV_j + \alpha_2 ROA_j + \alpha_3 LN(MV)_j + \alpha_4 CASH_j + \alpha_5 \Delta CASH_j \\ & + \alpha_6 INTRD_j + \alpha_7 LOSS_j + \alpha_8 FRAUD_j + \varepsilon_j \end{aligned} \quad (1)$$

where:

- $Bankruptcy_j$ = indicator variable set equal to 1 if firm j filed for chapter 11 bankruptcy, otherwise zero;
- LEV_j = leverage ratio (the sum of book value of long-term debt and short-term debt, divided by total assets);
- ROA_j = return on assets (net income divided by total assets);
- $Ln(MV)_j$ = firm size (the natural logarithm of market capitalization at the end of the fiscal year);
- $CASH_j$ = liquidity (cash holdings divided by total assets);
- $\Delta CASH_j$ = change in liquidity (change in cash, divided by total assets);
- $INTRD_j$ = intensity in research and development (R&D expense divided by total assets);
- $LOSS_j$ = indicator variable set equal to 1 if the firm has a loss during the year, otherwise zero;
- $FRAUD_j$ = indicator variable set equal to 1 if firm j received an AAER, where the first year of fraud was within five (retested within six and seven) years of the bankruptcy, otherwise zero;
- α_i = regression coefficients, $i \in [0, 8]$;

In equation (1), the coefficient (α_8) on fraud ($FRAUD_j$) represents firms that were detected as having fraudulent financial statements starting within five (retested within six or seven) years of the bankruptcy. As discussed in the Fraud and Bankruptcy literature review section, Rosner (2003) finds that the pre-bankruptcy financial statements of some distressed firms', whose accrual behavior resemble those of fraud firms, exhibit greater income-increasing accruals than control firms. Additionally, Leach and Newson (2007) examine earnings management of firms that file bankruptcy and "find that firms, which eventually file for bankruptcy, attempt to manage their earnings in order to make their financial statements appear more favorable over the years prior to filing for bankruptcy." Thus, fraudulent reporting could indicate that management is enhancing the financial statements in an attempt to avoid covenant

violations and subsequent bankruptcy filing. In many cases, however, the actions will only delay the resulting bankruptcy. Accordingly, we predict this coefficient (α_8) on the fraud variable ($FRAUD_j$) will be positively associated with bankruptcy ($Bankruptcy_j$). This prediction is formally stated in our first hypothesis below (in alternative form).

H1: The material manipulation of financial information by management initiated within five years (retested within six or seven years) of filing for Chapter 11 bankruptcy protection is *positively* associated with bankruptcy ($\beta_8 > 0$).

Bankruptcy Emergence Model

For our second model and hypothesis, which examines the relation between fraud and bankruptcy emergence, we create an indicator (0, 1) variable, $EMERGE_j$, to serve as the dependent variable in our tests. We set $EMERGE_j$ equal to one if the firm emerges from bankruptcy; otherwise, it is set to zero.

As in the first hypothesis we create an indicator (0, 1) variable for fraud, $FRAUD_j$, to test our main prediction. $FRAUD_j$ is set to one if the firm receives an AAER issued by the SEC, where the first year of the fraud begins within five (retested within six or seven years) years of bankruptcy filing; otherwise, $FRAUD_j$ is set to zero. To test for the effects that fraud has on bankruptcy emergence, we include this indicator variable in the model.

In addition to our variables of interest, we also include those variables that prior literature has identified as being highly associated with bankruptcy emergence (for discussion, see Bryan *et al.* 2002 or White 1984). We therefore include the interest coverage ratio for solvency (SOL_j); the quick ratio for liquidity (LIQ_j); return on assets (ROA_j) retained earnings to total assets (RE_j) for earnings prospects; inflation-adjusted total assets for firm size ($SIZE_j$); and inflation-adjusted plant, property and equipment less collateralized loans for free assets ($FREE_j$). Additionally, we

include net worth (NW_j) as an additional control variable. Chen and Wei (1993) identify net worth as the most commonly violated (and waived) debt covenant, and Bryan *et al.* (2002) argue that net worth is an early indicator of financial stress for a large proportion of bankrupt firms.

Further, following Kane *et al.* (1996) and Richardson *et al.* (1998), we control for the general economic conditions at the time of bankruptcy by including an indicator (0, 1) variable for recession (REC_j) that is set to one if the time period of the bankruptcy filing corresponds to a recessionary time period; zero otherwise.⁴ Mutchler (1986) also finds that auditor size may influence the issuance of a going concern opinion; hence, we include an indicator (0, 1) variable that is set to one if the auditor is a Big Eight (Six, Five or Four) auditor (BIG_j); otherwise it is set to zero. We include this control for size because the auditing literature discussed above suggests that, in certain situations, small audit firms are less inclined to issue going-concern opinions than are large audit firms.

Finally, some managers attempt to avoid bankruptcy by increasing earnings or improving the balance sheet information through changes in accounting rules and estimates. Significant changes are disclosed as modifications in the auditor's report. Additionally, other significant information that may be an indicator of bankruptcy, such as going concern opinions, is also included as modifications to the report. To control for the effects of these events that are disclosed in the audit report, we include an indicator (0, 1) variable, MOD_j that is set to one when there is a modified audit opinion; zero otherwise. Following Ohlson (1980), if the firm's fiscal year-end occurred within three months of the bankruptcy filing, we calculate our variables using

⁴ Kane *et al.* (1996) and Richardson *et al.* (1998) provide evidence that the prediction accuracy of bankruptcy models differs between recessionary periods and other periods. They do not, however, provide guidance on whether firms that file for bankruptcy protection during a recession are more or less likely to emerge. An argument could be made that firms filing for bankruptcy protection during a recession are less likely to emerge since the economy is poor. A counter-argument could be made, however, that firms filing for bankruptcy protection as the result of a recession would be more likely to emerge if (and when) the overall economy was to improve. We, therefore, place no directional prediction on this control variable.

the previous year's financial statements. The resulting logistic regression equation serves as our test model:

$$Emerge_j = \beta_0 + \beta_1 MOD_j + \beta_2 SOL_j + \beta_3 LIQ_j + \beta_4 ROA_j + \beta_5 RE_j + \beta_6 SIZE_j + \beta_7 FREE_j + \beta_8 NW_j + \beta_9 REC_j + \beta_{10} BIG_j + \beta_{11} FRAUD_j + \varepsilon_j \quad (2)$$

where:

- $Emerge_j$ = indicator variable set equal to 1 if firm j is reorganized or was acquired/merged, otherwise zero;
- MOD_j = indicator variable set equal to 1 if firm j switched auditors in the year prior to filing for bankruptcy protection, otherwise zero;
- SOL_j = interest coverage ratio (the sum of earnings before extraordinary items and interest expense, divided by interest expense);
- LIQ_j = quick ratio (current assets less inventory, divided by current liabilities);
- ROA_j = return on assets (net income divided by total assets);
- RE_j = retained earnings divided by total assets;
- $SIZE_j$ = log of inflation adjusted total assets (adjusted using the Gross National Product Index);
- $FREE_j$ = adjusted free assets (property, plant and equipment less collateralized loans, less mortgages and other secured loans, divided by total assets);
- NW_j = net worth (total stockholders' equity divided by total assets);
- REC_j = indicator variable set equal to 1 if the bankruptcy filing occurred during a recessionary period, otherwise zero;
- BIG_j = indicator variable set equal to 1 if firm j is audited by a Big Eight (Six, Five or Four) firm in the year prior to filing bankruptcy, otherwise zero;
- $FRAUD_j$ = indicator variable set equal to 1 if firm j received an AAER, where the first year of fraud was within five (retested within six and seven) years of the bankruptcy, otherwise zero;
- β_i = regression coefficients, $i \in [0, 11]$;

In equation (2), the coefficient (β_{11}) on fraud ($FRAUD_j$) represents firms that were detected as having fraudulent financial statements starting within five (retested within six or seven) years of bankruptcy filing. Bradshaw *et al.* (2001) provide evidence that auditors fail to sufficiently warn financial statement users of the pending financial stress that typically

accompanies high positive accounting accruals. As a consequence, Bryan *et. al* (2012) argue and find that firms filing for bankruptcy protection that utilize high income increasing discretionary accruals without receiving going-concern opinions will likely have delayed bankruptcy filing resulting in a depletion of their assets and thus reducing their ability to avoid liquidation. Similarly, fraud could enhance the financial statements delaying covenant violations or going-concern opinions, resulting in the delay of bankruptcy and allowing a deterioration of the remaining assets. As a result, when these firms enter bankruptcy, the viability of the firm is lower and, thus, the chance that the firm will emerge from bankruptcy is reduced. We predict this coefficient (β_{11}) on the fraud variable ($FRAUD_j$) will be negatively associated with emergence ($EMERGE_j$). This prediction is formally stated in our hypothesis below (in alternative form).

H2: The material manipulation of financial information by management initiated within five years (retested within six or seven years) of filing for Chapter 11 bankruptcy protection is *negatively* associated with emergence from bankruptcy ($\beta_{11} < 0$).

IV. EMPIRICAL ISSUES

Sample Selection Criteria

Extending Bryan *et al.*'s (2002) sample selection procedure, our sample consists of those firms that are listed on *Compustat* and identified on the *National Automated Accounting Research System (NAARS)* as having filed for Chapter 11 bankruptcy protection. Additionally, we have included firms identified on *The Bankruptcy Datasource* (New Generation Research on *Lexus/Nexus*). This process yielded 1,582 firms that filed for bankruptcy protection during the 1989-2005 period.⁵ From this sample, 98 firms from regulated industries were excluded. In addition, we deleted 478 firms missing *Compustat* data that was not available elsewhere. Data for the fraud was obtained from the annual files of the University of California, Berkeley AAER Dataset. Data regarding the bankruptcy resolution (reorganized, acquired/merged or liquidated) was collected from *The Bankruptcy Datasource*, *Lexus/Nexus*, and subsequent 10Ks, 10Qs and 8Ks for the remaining 1006 firms. Our final sample consists of 440 firms (43.7-percent) that emerged from bankruptcy or were acquired/merged with another firm, and 566 firms (56.3-percent) that liquidated.⁶ Of our total sample, 4.7-percent started fraudulent reporting within seven years prior to bankruptcy filing. Finally, we generated a sample of non-bankruptcy firms by matching each bankruptcy data record with a single, non-bankrupt firm, based on the bankruptcy year, industry, and beginning of the year total assets, which is a proxy for firm size.

⁵ We set the beginning of our sample period to encompass SAS No. 53, "The Auditor's Responsibility to Detect and Report Errors and Irregularities," which became effective in 1989. The 2005 cutoff corresponds with the latest first year of fraud from the Berkeley fraud data set. This also our sample sufficient time period after a fraud to be detected, and the results from the Chapter 11 bankruptcy filing to be resolved.

⁶ In comparison, the percentage of liquidations in prior studies were: 56-percent of Bryan *et al.*'s (2012) sample; 19-percent of Bryan *et al.*'s (2002) sample; 25-percent of Casterella *et al.*'s (2000) sample; 32-percent of Campbell's (1996) 1987 to 1992 sample; 27-percent of Kennedy and Shaw's (1991) 1973 to 1985 sample; 26-percent of Morse and Shaw's (1988) 1973 to 1982 sample; and, 50 percent of Casey, *et al.*'s (1986) 1970 to 1981 sample.

Our sample selection procedure is summarized on Table 1.

Insert Table 1 Here

Descriptive Statistics

Table 2, Panel A presents descriptive statistics of our variables for our first hypothesis. The control variables that are typically examined for bankruptcy exhibit the characteristics expected for a sample of bankrupt firms found in the second set of columns (bankrupt firms). We find that leverage is high, return on assets and change in cash are negative, a low proportion of cash relative to total assets, intensity of R&D is low, and a high proportion of losses. For our variable of interest, $FRAUD_j$, we find that over four percent of the bankrupt sample firms have AAERs. In comparing those firms that filed for bankruptcy against a matched pair of non-bankrupt firms, we find that firms that filed bankruptcy exhibit significantly greater leverage, higher proportion of losses, and lower returns on assets, size, cash and change in cash. Additionally, we find that they exhibit weakly significantly higher rates of fraud than non-bankrupt firms.

Insert Table 2 Here

Table 2, Panel B presents descriptive statistics of our variables for our second hypothesis. The control variables that are typically examined for bankruptcy emergence exhibit the characteristics expected for a sample of bankrupt firms. We find for these firms that solvency is negative, liquidity is low, return on assets and retained earnings both are negative, a low

proportion of assets are 'free,' and net worth is negative. In comparing those firms that emerged from bankruptcy against those that liquidated, we find that firms that emerged exhibit significantly higher returns on assets, greater size, and more firms audited by the Big Auditors. Additionally, we find that they exhibit weakly significantly greater solvency than those that liquidated. We also find that firms that emerged exhibit significantly lower liquidity and net worth than those that liquidated. Net worth represent the book value of "Assets in Place," and in the liquidation decision, stakeholders compare the value of "Assets in Place" with the value of "Assets in Years." When the value of "Assets in Place" is greater, the creditors are better off with liquidation allowing them to force bankruptcy and liquidation when there is still value in the firm's assets. This is consistent with our findings that emerging firms exhibit higher solvency and lower net worth. Similarly, liquidity cannot be examined alone. Bryan et al. (2002) find that firms with high levels of solvency (low solvency risk) and low levels of liquidity (high liquidity risk) are most likely to emerge from bankruptcy while firms with low levels of solvency (high solvency risk). Thus, emerging firms can exhibit higher solvency and lower liquidity. For our variables of interest, we find that the rate of AAERs (our fraud indicator) issued for successfully emerging firms is lower but not significantly different than the rate for liquidated firms.

V. EMPIRICAL RESULTS

Bankruptcy Regression Results

Table 3 presents the results from testing our first hypothesis on fraud's relation to bankruptcy, after controlling for the variables identified in prior literature as being highly associated with bankruptcy. The first column of Table 3 presents our results from regressing $BANKRUPTCY_j$ on our control variables. Consistent with the prior literature, leverage and loss are significantly positively related to bankruptcy filing and return on assets, size, and cash are significantly negatively related to emergence from bankruptcy.

Insert Table 3 Here

To test our first hypothesis, we run three models (columns two to four), each with a different time interval for our fraud variable; five, six, and seven years from initial year of fraud to bankruptcy filing. For our first hypothesis, that fraud is positively associated with bankruptcy, we find support across the three time period measures. The coefficients on $FRAUD_j$ are 1.442, 1.388, and 1.278 for the five-, six- and seven-year time period, respectively (all significant at a one-percent level). The results suggest that fraudulent financial reporting is related to subsequent bankruptcy and consistent with the argument that manager's actions, such as fraudulent financial reporting, are attempt to hide financial distress in order to avoid or delay stakeholders from forcing bankruptcy, or other similar actions. In our second hypothesis we argue that these actions allow a firm to deteriorate beyond the point where financial recovery is feasible and that these fraudulent firms are less likely to emerge from bankruptcy.

Bankruptcy Emergence Regression Results

Table 4 presents the results from testing our second prediction on fraud, fraud is negatively associated with bankruptcy emergence, after controlling for the variables identified in prior literature as being highly associated with bankruptcy emergence. The first column of Table 4 presents our results from regressing emergence on our control variables. Consistent with the prior literature, these variables are highly correlated and only size and net worth are (incremental to the other control variables) significantly related to emergence from bankruptcy. Size is positively related to emergence from bankruptcy, while net worth is significantly negatively related to emergence. Chen and Wei (1993) find that net worth is the most commonly violated debt covenant. This indicates that creditors may set a higher threshold for net worth (as well as retained earnings), which allows them to force bankruptcy and liquidation when there is still value in the firm, consistent with the negative coefficient. The other control variables are not incrementally relevant from each other.

Insert Table 4 Here

Similar to the test of our first hypothesis, for the second hypothesis we run three models (columns two to four each with a different time interval for our fraud variable) to test that fraud is negatively associated with bankruptcy emergence. We find support across the three time period fraud variables. The coefficients on $FRAUD_j$ are -0.743 for the five year period, -0.621 for the six year period and -0.726 for the seven year period (all significant at a five-percent level,

one-tailed).⁷ The results suggest that fraudulent financial reporting adversely affects firms' chances for emergence from bankruptcy.

Overall, our results suggest that when a firm is ultimately facing bankruptcy, managers' actions, such as fraudulent financial reporting, are related to financial distress (potential bankruptcy). Our results further indicate that such actions could delay the bankruptcy filing allowing a firm to deteriorate beyond the point where financial recovery is feasible resulting in liquidation. The prior literature that documents fraud and bankruptcy fails to capture these important relationships.

VI. CONCLUSION

In this study, we examine the relation between managements' fraudulent financial reporting and bankruptcy filing and the subsequent resolution of the bankruptcy (emergence or liquidation). Fraudulent reporting can have a significant impact on all stakeholders, including employees, suppliers, customers, investors (shareholders, and creditors) and society. When firms that commit financial reporting fraud file for bankruptcy protection, the impact on stakeholders increases. Thus, examining the relation of fraud on bankruptcy and bankruptcy emergence is of interest to investors, auditors and the PCAOB.

We hypothesize that if managers are trying to avoid bankruptcy by manipulating the financial information, there will be a positive relation between fraud and bankruptcy when managers' attempts are unsuccessful. Our results show that fraudulent financial reporting is significantly associated with bankruptcy filing. This evidence suggests that managers

⁷ Frauds that occur for a relatively short time may not be a tactic used to by managers to mask the financial distress of companies. According we deleted 14 AAERs that were only related to one fiscal year and reran our tests. The results of these additional tests (not presented) are similar to those reported in the paper.

fraudulently report financial information in an attempt to mask financial distress to avoid bankruptcy filing.

We further examine whether fraudulent financial reporting which precedes bankruptcy filing reduces the chance that the firm will emerge from bankruptcy. For these distressed firms, when managers fraudulently report financial information in order to mask the firms' deteriorating conditions to avoid or delay actions (such as debt covenant violations and going concern audit opinions) that lead to bankruptcy, these actions will likely have delayed the bankruptcy process and depleted the firms' assets to the point where management's post-bankruptcy plans may be insufficient to reverse a pending financial collapse and, thus, make it more difficult for them to emerge from bankruptcy. We find that fraud is negatively associated with bankruptcy emergence. For these fraudulent firms, the bankruptcy filing is more likely to occur too late, such that the remaining assets in place are insufficient to reverse the pending financial collapse.

Taken together, these results indicate that greater care by auditors, analysts, and others in detecting financial reporting fraud for companies approaching bankruptcy could mitigate the high losses associated with bankruptcy. Our results suggest that concerns about fraud cannot be postponed until a firm is close to filing; rather, since we find fraud to avoid bankruptcy begins at the early signs of financial distress, auditors, analysts and others must be diligent in searching for fraud at the first sign of financial distress. We expect these findings to be of great interest to investors, auditors and the PCAOB as the board revisits the existing set of auditing guidelines concerning the auditor's responsibility for detecting fraud.

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TABLE 1
Sample Selection

Description	Firms	Percent of Sample
Compustat listed firms noted on NAARS and/or The Bankruptcy Datasource as having filed for Chapter 11 Bankruptcy protection from 1989-2005 with the prior financial statements after the SAS 53 effective date:	1,582	100.0%
Less firms from regulated industries	(98)	6.2%
Subtotal	1,484	93.8%
Less firms Missing Compustat data	(478)	30.2%
Final Bankruptcy Sample	1,006	63.6%
Firms that committed fraud that started within seven years of bankruptcy (one in the year prior, 13 in two years prior, 11 in three years prior five in the four years prior, ten in five years prior, four in six years prior and three in seven years prior to bankruptcy)	47	4.7%
Firms emerging from bankruptcy	440	43.7%

TABLE 2
Descriptive Statistics

Panel A: Test and Control Variables for the Pooled Sample and the Sample Partitioned by Bankruptcy for the First Hypothesis

Variable	Pooled Sample			Bankrupt Firms			Non-Bankrupt Firms			Test of Means
	Mean	Med.	S.D.	Mean	Med.	S.D.	Mean	Med.	S.D.	
(2012 Observations: 1006 Bankrupt; 1006 Non Bankrupt)										
<i>LEV_j</i>	0.466	0.371	0.82	0.604	0.501	0.64	0.328	0.244	0.95	0.276 ***
<i>ROA_j</i>	-0.337	-0.079	1.05	-0.513	-0.195	1.13	-0.160	0.012	0.93	-0.353 ***
<i>Ln(MV)_j</i>	3.775	3.644	2.06	3.134	3.057	1.84	4.421	4.386	2.07	-1.287 ***
<i>CASH_j</i>	0.121	0.045	0.18	0.096	0.034	0.15	0.146	0.063	0.19	-0.050 ***
<i>ΔCASH_j</i>	-0.027	-0.002	0.20	-0.045	-0.005	0.21	-0.010	0.000	0.19	-0.035 ***
<i>INTRD_j</i>	0.056	0.000	0.20	0.063	0.000	0.23	0.049	0.000	0.17	0.014
<i>LOSS_j</i>	0.669	1.000	0.47	0.888	1.000	0.32	0.448	0.000	0.50	0.440 ***
<i>FRAUD_j</i> (within five yrs)	0.032	0.000	0.18	0.040	0.000	0.20	0.025	0.000	0.16	0.015 *
<i>FRAUD_j</i> (within six yrs)	0.036	0.000	0.19	0.044	0.000	0.20	0.028	0.000	0.17	0.016 *
<i>FRAUD_j</i> (within seven yrs)	0.038	0.000	0.19	0.047	0.000	0.21	0.030	0.000	0.17	0.017 **

TABLE 2: Continued
Descriptive Statistics

Panel B: Test and Control Variables for the Sample Partitioned by Bankruptcy Emergence for the Second Hypothesis

Variable	Bankrupt Sample			Emerge Firms			Liquidate Firms			Test of Means
	Mean	Med.	S.D.	Mean	Med.	S.D.	Mean	Med.	S.D.	
(1006 Observations: 440 Emerge Firms; 566 Liquidate Firms)										
MOD _j	0.609	1.000	0.49	0.620	1.000	0.49	0.601	1.000	0.49	0.019
SOL _j	-43.194	-2.124	558.54	-13.293	-1.394	112.73	-66.438	-2.680	737.42	53.145 *
LIQ _j	0.857	0.561	1.16	0.755	0.566	0.90	0.935	0.561	1.33	-0.180 **
ROA _j	-0.513	-0.195	1.13	-0.401	-0.168	0.92	-0.600	-0.210	1.26	0.199 ***
RE _j	-2.603	-0.393	14.69	-2.659	-0.349	19.83	-2.560	-0.453	8.85	-0.099
SIZE _j	4.163	4.217	1.83	4.845	4.882	1.87	3.633	3.631	1.61	1.212 ***
FREE _j	0.144	0.139	0.33	0.160	0.163	0.36	0.132	0.124	0.30	0.028
NW _j	-0.074	0.128	1.01	-0.162	0.048	1.12	-0.005	0.171	0.90	-0.157 **
REC _j	0.170	0.000	0.38	0.168	0.000	0.37	0.171	0.000	0.38	-0.003
BIG _j	0.816	1.000	0.39	0.861	1.000	0.35	0.781	1.000	0.41	0.080 ***
FRAUD _j (within five yrs)	0.040	0.000	0.20	0.030	0.000	0.17	0.048	0.000	0.21	-0.018
FRAUD _j (within six yrs)	0.044	0.000	0.20	0.036	0.000	0.19	0.049	0.000	0.22	-0.013
FRAUD _j (within seven yrs)	0.047	0.000	0.21	0.036	0.000	0.19	0.055	0.000	0.23	-0.019

TABLE 2: Continued

Notes:

The variables are defined as follows:

LEV_j	= leverage ratio (the sum of book value of long-term debt and short-term debt, divided by total assets);
ROA_j	= return on assets (net income divided by total assets);
$Ln(MV)_j$	= firm size (the natural logarithm of market capitalization at the end of the fiscal year);
$CASH_j$	= liquidity (cash holdings divided by total assets);
$\Delta CASH_j$	= change in liquidity (change in cash, divided by total assets);
$INTRD_j$	= intensity in research and development (R&D expense divided by total assets);
$LOSS_j$	= indicator variable set equal to 1 if the firm has a loss during the year, otherwise zero;
$FRAUD_j$	= indicator variable set equal to 1 if firm j received an AAER, where the first year of fraud was within five (retested within six and seven) years of the bankruptcy, otherwise zero;
MOD_j	= indicator variable set equal to 1 if firm j switched auditors in the year prior to filing for bankruptcy protection, otherwise zero;
SOL_j	= interest coverage ratio (the sum of earnings before extraordinary items and interest expense, divided by interest expense);
LIQ_j	= quick ratio (current assets less inventory, divided by current liabilities);
RE_j	= retained earnings divided by total assets;
$SIZE_j$	= log of inflation adjusted total assets (adjusted using the Gross National Product Index);
$FREE_j$	= adjusted free assets (property, plant and equipment less collateralized loans, less mortgages and other secured loans, divided by total assets);
NW_j	= net worth (total stockholders' equity divided by total assets);
DEF_j	= indicator variable set equal to 1 if the firm was in default of any of its debt covenants, otherwise zero;
REC_j	= indicator variable set equal to 1 if the bankruptcy filing occurred during a recessionary period, otherwise zero;
BIG_j	= indicator variable set equal to 1 if firm j is audited by a Big Eight (Six, Five or Four) firm in the year prior to filing bankruptcy, otherwise zero;

*, **, *** indicate significance at the ten, five and one-percent level, respectively for a two-tailed test.

TABLE 3

Results of Regressing Bankruptcy on Fraud with Control Variables for Leverage, Return on Assets, Size, Liquidity, Change in Liquidity, R&D Intensity, and Loss

Variable	sign	Test of Controls Only	Test of Fraud Started Within Five Years of Bankruptcy	Test of Fraud Started Within Six Years of Bankruptcy	Test of Fraud Started Within Seven Years of Bankruptcy
Pseudo R ²		0.6100	0.6140	0.6140	0.6140
<i>Intercept</i>	?	-0.868 -4.87 ***	-0.860 -4.79 ***	-0.857 -4.76 ***	-0.861 -4.79 ***
<i>LEV_j</i>	+	0.510 3.63 ***	0.500 3.57 ***	0.498 3.54 ***	0.501 3.56 ***
<i>ROA_j</i>	-	-0.151 -2.01 **	-0.145 -1.96 **	-0.145 -1.96 **	-0.148 -1.99 **
<i>Ln(MV)_j</i>	-	-0.143 -4.94 ***	-0.162 -5.51 ***	-0.164 -5.55 ***	-0.161 -5.47 ***
<i>CASH_j</i>	-	-1.925 -5.74 ***	-1.974 -5.84 ***	-1.961 -5.81 ***	-1.966 -5.82 ***
<i>ΔCASH_j</i>	-	-0.123 -0.47	-0.159 -0.60	-0.156 -0.59	-0.159 -0.60
<i>INTRD_j</i>	-	-0.105 -0.35	-0.120 -0.40	-0.123 -0.41	-0.136 -0.45
<i>LOSS_j</i>	+	1.964 15.02 ***	2.005 15.12 ***	2.005 15.12 ***	1.996 15.09 ***
<i>FRAUD_j</i>	+		1.442 4.64 ###	1.388 4.65 ###	1.278 4.42 ###

TABLE 3: Continued

Notes:

The logistic regression equation is:

$$\begin{aligned} Bankruptcy_j = & \alpha_0 + \alpha_1 LEV_j + \alpha_2 ROA_j + \alpha_3 LN(MV)_j + \alpha_4 CASH_j + \alpha_5 \Delta CASH_j \\ & + \alpha_6 INTRD_j + \alpha_7 LOSS_j + \alpha_8 FRAUD_j + \varepsilon_j \end{aligned}$$

The variables are defined as follows:

- $Bankruptcy_j$ = indicator variable set equal to 1 if firm j filed for chapter 11 bankruptcy, otherwise zero;
- LEV_j = leverage ratio (the sum of book value of long-term debt and short-term debt, divided by total assets);
- ROA_j = return on assets (net income divided by total assets);
- $Ln(MV)_j$ = firm size (the natural logarithm of market capitalization at the end of the fiscal year);
- $CASH_j$ = liquidity (cash holdings divided by total assets);
- $\Delta CASH_j$ = change in liquidity (change in cash, divided by total assets);
- $INTRD_j$ = intensity in research and development (R&D expense divided by total assets);
- $LOSS_j$ = indicator variable set equal to 1 if the firm has a loss during the year, otherwise zero;
- $FRAUD_j$ = indicator variable set equal to 1 if firm j received an AAER, where the first year of fraud was within five (retested within six and seven) years of the bankruptcy, otherwise zero;

*, **, *** indicate significance at the ten, five and one-percent level, respectively for a two-tailed test.

#, ##, ### indicate significance at the ten, five and one-percent level, respectively for a one-tailed test.

TABLE 4
Results of Regressing Emergence on Fraud with Control Variables for Modified Audit
Opinions, Free Assets, Recessionary Periods, Auditor Size, and Other Bankruptcy
Emergence Indicators

Variable	sign	Test of Controls Only	Test of Fraud Started Within Five Years of Bankruptcy	Test of Fraud Started Within Six Years of Bankruptcy	Test of Fraud Started Within Seven Years of Bankruptcy
Psuedo R²		0.4490	0.4550	0.4540	0.4560
Intercept	?	-2.144 -8.03 **	-2.146 -8.07 ***	-2.146 -8.07 ***	-2.147 -8.07 ***
MOD_j	?	0.171 1.14	0.172 1.16	0.174 1.17	0.175 1.18
SOL_j	+	0.000 0.54	0.000 0.57	0.000 0.56	0.000 0.57
LIQ_j	+	-0.073 -1.10	-0.057 -0.82	-0.059 -0.85	-0.057 -0.82
ROA_j	+	0.076 0.82	0.066 0.73	0.068 0.75	0.067 0.74
RE_j	+	-0.007 -0.77	-0.007 -0.80	-0.006 -0.78	-0.006 -0.78
SIZE_j	+	0.487 9.53 ***	0.497 9.68 ***	0.496 9.67 ***	0.497 9.70 ***
FREE_j	+	0.136 0.63	0.108 0.50	0.115 0.54	0.107 0.50
NW_j	+	-0.326 -3.40 ***	-0.318 -3.32 ***	-0.325 -3.38 ***	-0.324 -3.37 ***
REC_j	?	-0.142 -0.77	-0.172 -0.92	-0.170 -0.91	-0.177 -0.95
BIG_j	+	-0.253 -1.24	-0.274 -1.34	-0.273 -1.34	-0.273 -1.34
FRAUD_j	-		-0.743 -1.98 ##	-0.621 -1.77 ##	-0.726 -2.10 ##

TABLE 4: Continued

Notes:

The logistic regression equation is:

$$\begin{aligned} \text{Emerge}_j = & \beta_0 + \beta_1 \text{MOD}_j + \beta_2 \text{SOL}_j + \beta_3 \text{LIQ}_j + \beta_4 \text{ROA}_j + \beta_5 \text{RE}_j + \beta_6 \text{SIZE}_j + \beta_7 \text{FREE}_j \\ & + \beta_8 \text{NW}_j + \beta_9 \text{REC}_j + \beta_{10} \text{BIG}_j + \beta_{11} \text{FRAUD}_j + \varepsilon_j \end{aligned}$$

<i>Emerge_j</i>	= indicator variable set equal to 1 if firm <i>j</i> is reorganized or was acquired/merged, otherwise zero;
<i>MOD_j</i>	= indicator variable set equal to 1 if firm <i>j</i> switched auditors in the year prior to filing for bankruptcy protection, otherwise zero;
<i>SOL_j</i>	= interest coverage ratio (the sum of earnings before extraordinary items and interest expense, divided by interest expense);
<i>LIQ_j</i>	= quick ratio (current assets less inventory, divided by current liabilities);
<i>ROA_j</i>	= return on assets (net income divided by average total assets);
<i>RE_j</i>	= retained earnings divided by total assets;
<i>SIZE_j</i>	= log of inflation adjusted total assets (adjusted using the Gross National Product Index);
<i>FREE_j</i>	= adjusted free assets (property, plant and equipment less collateralized loans, less mortgages and other secured loans, divided by total assets);
<i>NW_j</i>	= total stockholders' equity divided by total assets;
<i>DEF_j</i>	= indicator variable set equal to 1 if the firm was in default of any of its debt covenants, otherwise zero;
<i>REC_j</i>	= indicator variable set equal to 1 if the bankruptcy filing occurred during a recessionary period, otherwise zero;
<i>BIG_j</i>	= indicator variable set equal to 1 if firm <i>j</i> is audited by a Big Eight (Six, Five or Four) firm in the year prior to filing bankruptcy, otherwise zero;
<i>FRAUD_j</i>	= indicator variable set equal to 1 if firm <i>j</i> received an AAER, where the first year of fraud was within five (retested within six and seven) years of the bankruptcy, otherwise zero;

*, **, *** indicate significance at the ten, five and one-percent level, respectively for a two-tailed test.

#, ##, ### indicate significance at the ten, five and one-percent level, respectively for a one-tailed test.