

# CORPORATE DISCLOSURES AFTER THE SEPTEMBER 11 TERRORIST ATTACKS

Myojung Cho, Fordham University  
John Shon, Fordham University  
Yuan Xie, Fordham University

## ABSTRACT

*We examine the actions that insurance firms take immediately after the September 11 attacks to reduce information asymmetries. We find that voluntary disclosure behavior is positively related to the magnitude of the September 11-related loss. Conditioning for the loss, disclosure behavior also systematically varies with firm leverage. However, these disclosures do not seem to impact the bid-ask spreads of the disclosing firms, perhaps because of the higher levels of uncertainty related to the extreme nature of the attacks. The study sheds light on the reactions of management during crisis events and the effect (or lack thereof) of such actions on firms' information environment.*

**JEL:** G14, G22, M40

**KEYWORDS:** Corporate disclosure, terrorist attacks, bid-ask spread, crisis management

## INTRODUCTION

On the morning of September 11, 2001, terrorists used airplanes to crash into and destroy the World Trade Center buildings in New York City. This terrorist attack (hereafter 9/11) was a huge, unprecedented event in world history, and impacted both U.S. and global economies and markets (e.g., Chen and Siems, 2004). For insurance companies, it represented the largest catastrophic event in U.S. history, representing \$40-70 billion in insurance losses (e.g., Park, 2008; Doherty et al., 2003). Because of the unprecedented magnitude of property loss and potential open-ended liability losses, estimates about the magnitude of the losses provided by insurers tended to have wide boundaries and were subject to large margins of error. This increased information asymmetries between managers and market participants, which therefore increased the cost of potentially much-needed external capital.

The main goal of the current study is to examine how managers reacted to this change in information asymmetries. Specifically, given that insurance firms experience an exogenous shock that increases information asymmetries, how do managers change their disclosure practices to mitigate them? A large body of research in the accounting literature suggests that managers have different types of disclosure mechanisms at their disposal (e.g., Healy and Palepu, 2001); we examine one particular type of disclosure mechanism: press releases.

We examine the disclosure practices of the 105 firms in the insurance industry during the September 11 attacks. Overall, we find that firms with larger 9/11-related losses make a higher level of disclosures. We also find that conditioning on the level of losses, firms' disclosure behavior systematically varies with the level of leverage. This suggests that the relation between losses and disclosures in this crisis context systematically varies with leverage. Lastly, we find that these disclosures have little impact on the average bid-ask spreads upon market opening on September 17.

We contribute to the literature in two ways. First, extant studies in the insurance/risk literature examine the stock price behavior of insurance firms following 9/11, assuming that information asymmetries related to insurance losses play a major role in such behavior. However, none of these studies examine

managers' attempts at resolving such information asymmetries. Explicitly examining managers' disclosures helps fill this gap, showing how managers disclose in moments of crisis. Second, several studies in the accounting literature examine voluntary disclosure behavior of managers experiencing firm-specific events (e.g., earnings surprises). However, we are not aware of any studies that consider exogenous events that are outside the manager's control, particularly significant crisis events like 9/11. The behavior we document therefore sheds light on how managers may respond to future crisis events.

## **BACKGROUND AND LITERATURE REVIEW**

The terrorist attacks on September 11, 2001 have been documented in several extant studies (e.g., Hogarth, 2002; Cummins and Lewis, 2003; Doherty et al., 2003; Park, 2008). The attacks were unprecedented, unanticipated, and had an enormous impact on the psychology of the nation and the world. The event also had many economic repercussions. Many studies have examined 9/11's adverse effect on various aspects of the stock market. The studies are interesting because they examine how market participants react in a crisis situation with a high degree of uncertainty (e.g., Glaser and Weber, 2005). The most immediate and salient effect of 9/11 was the closing of the New York Stock Exchange for six days. On Monday, September 17, trading resumed. The Wall Street Journal reports that trading on that day was marked by panic and selling: "the day's trading was skewed by panic selling... selling was heavy and deep" (Wall Street Journal, C1, September 18, 2001). The Dow Jones Industrial Average closed down 7.3%, the largest one-day point decline in U.S. history.

Glaser and Weber (2005) find that, overall, investor's estimates of expected returns were higher after 9/11, suggesting investors' belief in mean reversion. Estimates of expected volatility were also higher. Furthermore, differences in opinion about expected returns were lower, but differences in opinion about expected volatility remained the same. Industry-specific studies have concentrated mostly on the insurance and airline industries. Studies such as Hogarth (2002), Cummins and Lewis (2003), Doherty et al. (2003), and Park (2008) find that the event had a significant impact on the market capitalization of insurance companies, representing the most severe short-term stock price decline in the industry's history. However, there was a price reversal in the short-term over the next few weeks. Park (2008) finds that these price reversals are robust after controlling for post-9/11 changes in systematic risk, as well as the changes in idiosyncratic risk (that could generate correlated parameter estimation risk).

## **HYPOTHESIS DEVELOPMENT**

The impact of 9/11 on insurance companies is complex. Cummins and Lewis (2003) conclude that the insurance markets were in disequilibrium from the significant unexpected loss shocks arising from the event. These shocks were attributable to several factors. Insurance companies faced large, unexpected losses (i.e., claims, payouts). Moreover, because U.S.-based terrorism losses were unanticipated by the insurance companies, very little or no premium was ever collected (i.e., no revenues to balance against the losses). Even if losses were to be borne by international reinsurers, domestic insurers were still exposed to losses due to deductibles and policy limits, as well as participation in domestic reinsurance pools. Lastly, collectability of claims from reinsurers was also in question. Overall, the 9/11 terrorist attacks were an unanticipated event with little precedence, and caused significant potential open-ended liability losses that were very difficult to accurately estimate, and had the potential to take many years or decades to run off. Indeed, the attacks revealed new information about the frequency and severity of insured losses, thus increasing probability distributions related to such losses; these new uncertainties could not necessarily be diversified away. Thus, loss estimates given by insurers tended to have wide boundaries and were subject to large margins of error. This forced investors to reevaluate the future cash flows of insurance companies due to the new terrorism risk.

This sudden increase in the magnitude and nature of uncertainty dramatically increased information asymmetries between managers and market participants. This increase in information asymmetries in turn increased the demand for transparency, and therefore the demand for voluntary disclosures from management. The accounting literature has documented the effect of increased demand on the voluntary disclosure patterns of managers (e.g., Healy and Palepu, 2001). Consistent with this, Park (2008) provides anecdotal evidence that some firms attempted to resolve information asymmetries by announcing their net loss estimates before the markets reopened on September 17. The above discussion suggests the following empirical prediction: *H1*: Firms with relatively higher 9/11-related losses make more voluntary disclosures in the period following 9/11.

## SAMPLE, DATA, AND SAMPLE SELECTION

Our sample selection starts with all firms in the life insurance (SIC code 6311), accident and health insurance (6321), and fire/marine & casualty insurance (6331) industries during the September 11 attacks (see Park, 2008). The initial sample includes 119 firms from the quarterly Compustat and daily CRSP tapes. To mitigate survivorship bias, we include the research files, as well. We exclude 14 firms due to insufficient accounting or stock price data. Our final sample includes 105 firms.

Voluntary disclosure data is collected from Factiva. We search for press releases made in the period immediately following the September 11 attacks (i.e., 9/11/2001 to 12/31/2001) made via PR Newswire and BusinessWire. Similar to prior studies that hand-collect press releases (e.g., Miller, 2002), we assume that our disclosures are representative of the firm's overall corporate disclosure practice. To the extent that it is not (e.g., conference calls), this may add noise or bias to our inferences; however, several prior empirical studies find that firms' disclosure practices tend to be complementary (i.e., not substitutes). We read each press release for discussion about the 9/11 attacks. We ignore press releases that do not mention the 9/11 attacks. Our main disclosure metric is a simple count of the 9/11-related disclosures that we collect. We collect 9/11-related losses data from these press releases—as well as from earnings announcement press releases where 9/11 related losses are explicitly discussed. To the extent that firms experience 9/11-related losses but do not explicitly discuss them in either a voluntary disclosure or in the earnings announcement press release, our reported loss measure is potentially biased.

Table 1 provides descriptive statistics for the firms in our sample. The mean (median) 9/11-related loss (LOSS) is \$30.355 million (\$0 million). The highest LOSS reported is \$440 million (untabulated). However, comparing the loss relative to prior-period total assets (LOSST) suggests that the losses were not proportionately large. For instance, the 90th percentile LOSST is 0.005, suggesting that losses were only 0.5% of total assets. On average, firms made 0.6 voluntary disclosures (VOL\_DISCL) that explicitly mentioned the 9/11 attacks. The median firm made no VOL\_DISCL, while the 90th percentile firm made one VOL\_DISCL. The most "talkative" firm made six VOL\_DISCL (untabulated). One interesting finding is that 44% of our firms make 9/11-related disclosures. This is interesting because only 35% of the firms actually report 9/11-related losses (untabulated). The discrepancy arises from firms that make disclosures about the 9/11 attacks to merely state that they had no exposure to the event. This is an interesting aspect of voluntary disclosure activity that suggests firms signal in attempt to create a separating equilibrium. That is, given the extreme crisis event that we are examining, some firms make disclosures simply to state that there is no news to report. This further illustrates the non-linearity in the disclosure patterns of firms. Untabulated Pearson correlations reveal that the magnitude of the loss (LOSST) is positively correlated with voluntary disclosures (VOL\_DISCL), with a correlation coefficient of 0.455 ( $p=0.000$ ).

The mean (median) market value (MV) is \$4562 (\$570) million, suggesting that the sample skewed towards larger firms. Lastly, we find that earnings (NI) and earnings changes (DNI) are negative, and are

statistically different from those of the prior quarter. Quarterly returns (QRET) are positive, but are statistically lower than in the prior quarter.

Table 1: Descriptive Statistics

|           | EVENT QUARTER |        |        |        |       |       | PRIOR QTR | DIFFERENCE |
|-----------|---------------|--------|--------|--------|-------|-------|-----------|------------|
|           | MEAN          | 10%    | 25%    | 50%    | 75%   | 90%   | MEAN      | T-STAT     |
| LOSS      | 30.355        | 0      | 0      | 0      | 3     | 95    | -         | -          |
| LOSST     | 0.003         | 0      | 0      | 0      | 0.001 | 0.005 | -         | -          |
| NI        | -0.002        | -0.015 | -0.004 | 0.001  | 0.004 | 0.009 | 0.002     | -2.72      |
| DNI       | -0.007        | -0.064 | -0.007 | -0.002 | 0.000 | 0.002 | -0.002    | -2.81      |
| QRET      | 0.034         | -0.322 | -0.143 | 0.023  | 0.116 | 0.229 | 0.106     | -3.15      |
| VOL_DISCL | 0.600         | 0      | 0      | 0      | 1     | 1     | -         | -          |
| MV        | 4562          | 17     | 99     | 570    | 2373  | 8847  | 5072      | -0.19      |
| LEV       | 0.048         | 0.000  | 0.016  | 0.039  | 0.066 | 0.103 | 0.050     | -0.32      |
| MTB       | 1.196         | 0.351  | 0.721  | 1.060  | 1.600 | 2.010 | 1.319     | -1.30      |

*This table presents descriptive statistics for the 105 publicly-traded insurance firms in our sample.*

## EMPIRICAL RESULTS

In Table 2, we present results from estimating a probit model, where our main dependent variable is the number of 9/11-related voluntary disclosures. The main independent variable is LOSST, the magnitude of 9/11-related losses, scaled by beginning total assets. Control variables include LEV, leverage (defined as beginning [total liabilities / total assets]), MV (lagged firm size), MTB (lagged market-to-book), and BAS (lagged average bid-ask spread). The model is as follows:  $VOL\_DISCL = b_0 + b_1 LOSST + b_2 LEV + b_3 MV + b_4 MTB + b_5 BAS + e$ . In the first model, we estimate a preliminary model that does not include LEV.

Table 2: Disclosures and September-11 Losses

|             | LOSST | LEV   | MV    | MTB   | BAS   |
|-------------|-------|-------|-------|-------|-------|
| COEFFICIENT | 46.36 |       | 0.20  | -0.37 | 0.88  |
| CHI-SQUARE  | 15.82 |       | 5.13  | 1.68  | 0.01  |
| P-VALUE     | 0.000 |       | 0.024 | 0.195 | 0.930 |
| COEFFICIENT | 47.06 | 1.92  | 0.22  | -0.42 | 1.25  |
| CHI-SQUARE  | 16.11 | 1.06  | 5.93  | 2.13  | 0.02  |
| P-VALUE     | 0.000 | 0.304 | 0.015 | 0.145 | 0.901 |

*This table presents results from a probit model estimation of the number of voluntary disclosures regressed on the level of 9/11 losses:  $VOL\_DISCL = b_0 + b_1 LOSST + b_2 LEV + b_3 MV + b_4 MTB + b_5 BAS + e$ .*

The coefficient on 9/11-related losses (LOSST) is significantly positive (47.06,  $p=0.000$ ), suggesting that larger losses are related to higher levels of disclosures. Next, in Table 3, we also consider the interaction of LOSST with LEV. Capacity constraint models suggest that firms with a stronger need for external capital may also exhibit a greater need to reduce information asymmetries. This suggests that, among insurance firms that experience a 9/11-related loss, those with relatively worse capital positions—that are in higher need for external capital—are more likely to increase voluntary disclosures to mitigate information asymmetries (e.g., Healy et al., 1999). Consistent with this prediction, we find that the coefficient on the LOSST\*LEV interaction term is significantly positive (444.49,  $p=0.021$ ), suggesting that the relation between disclosures and 9/11 losses systematically varies with firm leverage. That is, it is the firms with losses and relatively higher leverage that are more susceptible to capital shortages arising

from payouts/claims. Therefore, it is these firms that are most likely to make disclosures in an attempt to lower the cost of capital. In the second model, we interact LOSST with a decile-ranked transformation of LEV; this ensures that our results are not due to distributional properties of LEV. Results are qualitatively similar. Specifically, the LOSST interaction with ranked LEV is significantly positive (9.72,  $p=0.037$ ). Untabulated results also reveal that a similar decile-ranking of LOSST does not change any of the results.

Table 3: Disclosures and September-11 Losses, Interactions with Leverage

|             | LOSST | LEV   | LOSST*LEV | MV    | MTB   | BAS   |
|-------------|-------|-------|-----------|-------|-------|-------|
| COEFFICIENT | 36.93 | 1.57  | 444.49    | 0.21  | -0.40 | 1.64  |
| CHI-SQUARE  | 6.30  | 0.68  | 1.29      | 5.37  | 1.92  | 0.03  |
| P-VALUE     | 0.012 | 0.411 | 0.021     | 0.256 | 0.166 | 0.870 |
| COEFFICIENT | 29.53 | -0.01 | 9.72      | 0.20  | -0.42 | -0.79 |
| CHI-SQUARE  | 3.90  | 0.03  | 4.34      | 4.55  | 2.09  | 0.01  |
| P-VALUE     | 0.048 | 0.864 | 0.037     | 0.033 | 0.149 | 0.937 |

This table presents results from a probit model estimation of the number of voluntary disclosures regressed on the level of 9/11 losses:  $VOL\_DISCL = b_0 + b_1 LOSST + b_2 LEV + b_3 LOSST*LEV + b_4 MV + b_5 MTB + b_6 BAS + e$ .

One unique aspect of the September 11 attacks is the fact that the markets were closed by fiat for four trading days (Tuesday 9/11 to Friday 9/14), and only reopened on Monday, September 17. We find that many firms make voluntary disclosures in the period prior to the 9/17 market opening—perhaps as an attempt to reduce information asymmetries upon market opening. To test this possibility, we examine the relation between bid-ask spreads and voluntary disclosures.

In Table 4, we present results from estimating an OLS model, where the main dependent variable is the average bid-ask spread over the 9/17-9/19 window. The main independent variable is VOL-DISCL, the number of voluntary disclosures made in the pre-9/17 (a subset of the disclosures used in Table 1 tests). Control variables include LOSST (the magnitude of 9/11-related losses, scaled by beginning total assets), MV (lagged firm size), MTB (lagged market-to-book), and SPREAD (prior quarter’s average bid-ask spread). The model is as follows:  $BAS = b_0 + b_1 VOL\_DISCL + b_2 LOSST + b_3 MV + b_4 MTB + b_5 BAS_{t-1} + e$ .

Table 4: Bid-ask Spreads and Disclosures

|             | INTERCEPT | LOSST | VOLDISCL | MV     | MTB   | SPREAD | Adj-R2 |
|-------------|-----------|-------|----------|--------|-------|--------|--------|
| COEFFICIENT | 0.004     | 0.178 | -0.000   | -0.005 | 0.003 | 1.367  | 0.376  |
| T-STATISTIC | 0.323     | 0.559 | -0.094   | -2.259 | 0.409 | 6.094  |        |
| COEFFICIENT | 0.004     | 0.013 | -0.002   | -0.005 | 0.003 | 1.372  | 0.399  |
| T-STATISTIC | 0.306     | 1.995 | -0.499   | -2.545 | 0.496 | 6.251  |        |

This table presents results from an OLS model estimation of the average bid-ask spread during the 9/17-9/19/2001 period regressed on the number of voluntary disclosures made before market opening on 9/17/2001:  $BAS = b_0 + b_1 VOL\_DISCL + b_2 LOSST + b_3 MV + b_4 MTB + b_5 BAS_{t-1} + e$ .

The coefficient on VOL-DISCL is negative, but not statistically significant (-0.000,  $t=-0.094$ ), suggesting that pre-9/17 disclosures do not have an impact on the bid-ask spreads. Nor does the magnitude of the loss (LOSST) have an effect on bid-ask spreads. However, in our second model, we find that when we replace LOSST with a simple dummy variable for the existence of a loss, the coefficient for this dummy variable is significantly positive (0.013,  $t=1.995$ ), suggesting that the existence of a loss increases bid-ask

spreads, though the magnitudes do not necessarily do so; this specification does not change the insignificance of the VOL-DISCL coefficient. In untabulated results, we find that the interaction of LOSST with LEV is statistically insignificant. Consistent with prior literature, our results show that the most significant predictors of the immediate bid-ask spread are market value (MV) and prior-quarter's bid-ask spread (BAS). However, results overall should be interpreted with caution because the bid-ask spread is not driven by solely information asymmetry, but other components such as the adverse selection component, as well (Krinsky and Lee, 1996).

## SUMMARY AND DISCUSSION

We examine the voluntary disclosure behavior of firms in the insurance industry in the period immediately following a major crisis event; namely, the September 11 terrorist attacks. Of the 105 firms in our sample, 35% of them report losses explicitly related to the attacks. However, a larger number of firms (44%) make 9/11-related disclosures. The discrepancy arises from many firms having no insurance exposure to the attacks making disclosures of the “non-event” to their financial position. This is consistent with these unaffected firms making their disclosures or signaling to separate themselves from other firms, lest they be pooled together with those firms that do experience a loss from the event. Of those that incur insurance losses, firms with larger losses make a higher level of disclosures. Moreover, the interaction of 9/11-related losses and leverage are positively related to disclosures. Lastly, we find some weak evidence that the existence (though not magnitude) of a 9/11-related loss increases information asymmetries (i.e., bid-ask spread) in the immediate three-day period of market open (9/17-9/19/2001). However, making voluntary disclosures before the market opens on 9/17 does not seem to have an effect on bid-ask spreads.

Some of the evidence we provide is ex post not too surprising. For instance, perhaps it is not surprising to learn that voluntary disclosures were higher for firms that exhibited greater losses. In addition, though we were initially surprised at the non-trivial number of firms that disclosed their “non-event” status, the result is quite normal given the “lemons problem” discussed in Akerlof's (1970) seminal study. Other findings are a bit more surprising. For instance, our finding that firms with higher losses and higher leverage make relatively more disclosures is perhaps surprising to some readers because the magnitude of the losses as a share of total assets is not particularly significant (the mean loss 0.3% of total assets; the 90<sup>th</sup> percentile loss 0.5% of total assets). Further, it is not clear whether losses of similar magnitude for a non-crisis event like the 9/11 attacks would elicit similar behavior from management—it is difficult to imagine many scenarios where firms voluntarily disclose their “non-exposure” to other events that represent a mean 0.3% loss. Thus, the behavior we document is not meant to be extended to other “typical” scenarios. However, we do believe that the study may have some external validity in other crisis events, where market psychology may play a more significant role (e.g., Hurricane Katrina, the current mortgage-related financial crisis). Lastly, given the significant information asymmetries that the attacks created, it is perhaps surprising that firms' voluntary disclosures did not have an impact on the immediate bid-ask spreads of these firms. One interpretation of this non-result is that, though managers tried to reduce the information asymmetries via their disclosures, it seems that this was not reflected in bid-ask spreads because of the (irrational) fear that existed in the aftermath of the 9/11 attacks.

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## **BIOGRAPHY**

Professor Cho is an Assistant Professor at Fordham University's School of Business Administration. She has research interests in financial and managerial accounting issues including corporate disclosures of financial information and management earnings forecasts, analyst earnings forecasts, and executive compensation. The author can be contacted at: Fordham University; Lincoln Center; 33 W. 60<sup>th</sup> Street; NY, NY 10023. mycho@fordham.edu.

Professor Shon is an Assistant Professor at Fordham University's Graduate School of Business. He has research interests in corporate voluntary disclosure behavior, sell-side analyst behavior, asset pricing anomalies, and various topics in behavioral finance. Fordham University; Lincoln Center; 33 W. 60<sup>th</sup> Street; NY, NY 10023. jshon@fordham.edu.

Professor Xie is an Assistant Professor at Fordham University's School of Business Administration. He has research interests in determinants and economic consequences of corporate financial reporting, and financial intermediaries and their roles in the capital market. Fordham University; Lincoln Center; 33 W. 60<sup>th</sup> Street; NY, NY 10023. yxie@fordham.edu.