The Value of Apology:

Apologies Impact on Stock Returns

A Thesis Submitted to the College of

Graduate Studies and Research

In partial fulfillment of the requirements

For the Degree of Master of Science in Finance

In the Department of Finance and Management Science

Edwards School of Business

University of Saskatchewan

Saskatoon, Saskatchewan, Canada

by

Michael J. Wynes

Permission to Use

In presenting this thesis in partial fulfillment of the requirements for a Postgraduate degree from the University of Saskatchewan, I agree that the Libraries of this University may make it freely available for inspection. I further agree that permission for copying of this thesis in any manner, in whole or in part, for scholarly purposes may be granted by the professor or professors who supervised my thesis work or, in their absence, by the Head of the Department or the Dean of the College in which my thesis work was done. It is understood that any copying or publication or use of this thesis or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the University of Saskatchewan in any scholarly use which may be made of any material in my thesis.

Requests for permission to copy or to make other use of material in this thesis in whole or part should be addressed to:

Head of the Department of Finance and Management Science

Edwards School of Business

University of Saskatchewan

25 Campus Drive

Saskatoon, Saskatchewan

S7N 5A7

Abstract

In a crisis managers are confronted with a dilemma between an ethical responsibility to respond to victims and their fiduciary responsibility to protect shareholder's wealth. This study provides empirical evidence that a company apology made during a crisis can have a positive or negative effect on stock price depending on the level of responsibility for a crisis born by the firm. We use Coombs' (2007) Situational Crisis Communication Theory to classify crises and appropriate response type for 235 unique crises between 1983 and 2013. We use event study methodology to study the effect of an apology on returns. The results show that managers apologizing to those affected for a victim or accidental crisis jeopardize shareholder wealth; however offering an apology for a preventable crisis offsets this negative effect.

Keywords: Apology; Crisis Management; Event Study; Situational Crisis Communication Theory; Stock Market Reaction.

JEL: D22; G14; H12; M14.

Acknowledgements

I would like to express my most sincere gratitude to my co-supervisors, Dr. Marie Racine and Dr. Craig Wilson, who have both supported me throughout my thesis with patience and knowledge whilst allowing me the room to work in my own way.

Besides my co-supervisors, I would like to thank the third member of my committee, Dr. Devan Mescall, who provided guidance and support for my thesis long before he was serving in an official capacity.

My sincere thanks must also go to Ms. Brenda Oriskchuk, Mrs. Wanda Gonda, and all the other supporting staff.

Finally, but most importantly I would like to thank my family for their love and support, but more specifically, I would like to thank my wife Angie. She has served many roles in helping me to bring this research to fruition. She has served as research assistant, editor, and motivator, to name just a few of her roles. She is part of the reason I do what I do, and it is with her continued support that I venture on to a PhD.

Table of Contents

Table of Tables

Table of Figures

1. Introduction

On April 20, 2010 while drilling an exploratory well in the Gulf of Mexico, the semi-submersible drilling rig *Deepwater Horizon* struck a high-pressure methane gas bubble that erupted and subsequently caused the vessel to become engulfed in flames. Efforts by multiple ships to douse the flames proved unsuccessful and on April 22, 2010 the rig sank into the ocean. This however was just the beginning of an event that would come to be known as the largest accidental oil spill in the history of marine oil and gas exploration.

The well site where the drill was operating was leaking into the ocean, killing marine life and damaging hundreds of miles of shorelines in the states of Georgia, Florida, Louisiana, and Mississippi. It wasn't until July 15 that the well was finally capped. Between the day of the explosion and the day the well was capped an estimated 4.9 million barrels of crude oil had leaked into the Gulf of Mexico. On September 19, 2010 a relief well was completed and the federal government declared the well "effectively dead".

Multiple parties were tied to the *Deepwater Horizon* vessel, but ultimately it was British Petroleum that received the brunt of the media attention and blame.[1] Perhaps looking at the *Exxon Valdez* oil spill as a case study in how to handle such a crisis, British Petroleum mounted an expansive public relations campaign.[2] However, in the aftermath of the explosion the share price of British Petroleum was beaten down, bottoming out at a loss of 52.34% before eventually making a recovery.[3] But why was British Petroleum's stock impacted so heavily? Was there something that management could have done to lessen the losses in share price suffered by the firm?

---

[1] Although British Petroleum owned the rights to the Macondo well, the rig was owned and leased from Transocean. Halliburton had performed the cement work on the well, which British Petroleum later claimed was one of the reasons the well suffered the blowout.

[2] The Exxon Valdez spill occurred when an oil tanker struck a reef and spilled oil into Prince William Sound. The disaster was the largest ever in U.S. waters until the Deepwater Horizon oil spill.

[3] By contrast, shares of Exxon lost 3.9% in the first two weeks following the spill and by four weeks post-crisis had recouped all their losses.

In other event studies looking at corporate crises, researchers find that firms in a crisis suffer losses in share value, but what happens to a firm's share price when the CEO, or another senior executive, offers an apology for the crisis? Can an apology restore lost market value or will it push the stock price lower? This paper examines the short-term stock price performance of firms that offer an apology in the midst of a crisis. Like prior crisis research, we rely on event study methodology to capture the impact of the crisis on share price. We then use cross-sectional regression analysis to investigate whether apologies contribute, for good or bad, to the change in share price observed in the market.

Our study finds that offering an apology when a firm is not clearly responsible for a crisis leads to larger losses in shareholder wealth. However, apologizing when a firm is responsible for a crisis does not lead to a statistically significant difference in share price. We also find that apologizing does not impact shareholder wealth in more severe crises. This should be welcomed news for managers of firms in a preventable crisis, since they can offer an apology to victims without putting shareholder wealth into jeopardy. But, in the case of firms in a non-preventable crisis, management must be aware that their words can have a large negative impact on shareholder wealth.

This paper is the first empirical study to directly look at how an apology can impact shareholder wealth. Prior research has focused mostly on victims and has relied largely on experimental design, qualitative analysis and other non-empirical methods. In the years 1987 to 2006 archival/empirical research accounted for only two percent of published research (An and Cheng 2009). This paper heeds the call for more empirical based research in the crisis management area (Coombs 2007a; 2007c; Brocato, Peterson, and Crittenden 2012). The remainder of the article is organized as follows: Section 2 summarizes previous literature and presents our hypotheses, Section 3 describes the methodology and data used, Section 4 presents the results with accompany-

ing discussion, Section 5 provides robustness tests, and lastly, Section 6 summarizes our findings, including limitations and future research directions.

2. Literature Review and Hypothesis Development

2.1 Literature Review

The proliferation of apologies by management has grown to a point where it is now almost expected with the first press release following a crisis. How a firm responds to a crisis will determine the narrative and affect how victims, shareholders, other stakeholders, and the general public shape their image of the firm (Coombs 1995).[4] The evolving dynamic of some relationships will take time to observe, like that of suppliers, but if markets are truly semi-strong efficient then the impact of a crisis should be reflected in the firm's share price in the immediate period following the crisis event.[5] Basic financial theory dictates that the share price of a firm is the discounted future cash flows generated from daily operations. Since a crisis, by definition, is a disruption in daily operations, it puts into question future cash flows and leads to negative changes in stock price (Coombs 2007c). Although not discussed by Coombs, it is reasonable to assume that a crisis would increase the riskiness of the firm, at least temporarily.

Not as easily identified as a firm's stock price, but arguably equally as important, is a firm's reputation. A firm's reputation can be a valuable intangible asset or a damning liability. Reputation is an image the firm has already established, often taking into account years of history. Since reputations take time to become established a firm cannot manufacture a good reputation artificially in the short term (Roberts and Dowling 2002). Reputations are formed based on economic and non-economic information available from the media, other monitors, such as ana-

[4] We term "other stakeholders" as consumers, employees, suppliers, debt financiers, and all other possible stakeholders that cannot be categorized as victims, shareholders, or the general public.

[5] We make no comment on how accurate this adjustment is. It would not be surprising to find the market overreacts in some cases and underreacts in another. This level of information-price efficiency is beyond the scope of our current study.

lysts, and the firm itself (Fombrun and Shanley 1990). Firms that have built credibility and a positive reputation are better able to weather a crisis. It will not prevent the inevitable fall in share price, but it can help to hasten the recovery (Pincus 1986; Coombs 2007a; Watson 2007). As an example, Schnietz and Epstein (2005) find that firms with a stronger reputation for social responsibility were able to withstand an industry shock better than firms with a weaker reputation for social responsibility.

A crisis can quickly turn a firm's reputation from favorable to unfavorable, which will change how stakeholders interact with the firm (Coombs 2007a). An unfavorable view can lead to decreased sales, loss of employees, suppliers unwilling to honor or renew contracts, and downward guidance of the firm's share price by equity analysts. These factors will cause the market to reevaluate the share price of the firm and will lead to a decline in share price. Managers are as concerned about the restoration and preservation of firm reputation as they are about capital market activity. Following this line of reasoning we make the assertion that firm reputation and share price are related.[6]

Prior literature concludes that crises lead to negative shocks on share price. Table 1 presents a summary of prior empirical based crisis research. We include only literature that examines multiple companies to avoid the specificity of each unique crisis in case studies on individual firms. Our study is concerned with seeing how the market responds, on average, to an apology. We will discuss a few of the papers in Table 1 as a sample of prior crisis research.

Knight and Pretty (1999) find that on average firms suffer a loss in value of 6.65% in the first ten days following a crisis. Further analysis reveals that firms can be divided into recoverers and non-recoverers, where the recovery portfolio reports losses of 3.24% in the first ten days compared to the non-recovery portfolio, which reports losses of 10.55%. This spread grows as

[6] We are not the first to make this connection. Both Fombrun (1996) and Kossovsky (2012) have made similar claims.

we move further away from the crisis, with the recovery portfolio realizing positive returns in the period beyond thirty days. The authors attempt to factor in the firms responsibility but find it is not significant in the short-term windows. No other attempt is made to control for the type of crisis faced by each firm and the full sample consists of only fifteen firms, making the overall conclusions difficult to accept without reservation.

Walker, Thiengtham, and Lin (2005) find that an aviation disaster leads to losses ranging from 3.10% in the first two days to 3.61% in the first month for airlines. The authors find that, when controlling for crisis causes, a terrorist action leads to lower returns up to the first week post crisis. Fatalities also had a negative effect on share price up to the first week post crisis. Similarly, Walker, Pukthuanthang, and Barabanov (2006) find that railroad companies suffer losses during the period around a railroad accident. Initial losses of 1.90% in the first two days are dampened by the one-month mark, where losses of only 0.19% are observed. The authors find that the cause of a crisis can only explain returns in the first two days and fatalities can explain returns in the first ten days.

The studies in Table 1 all consider how a crisis impacts share price, but none of them consider how management's response to the crisis will affect share price. Marcus and Goodman (1991) account for a company's response, what they term "corporate policy," to determine if certain actions hurt one party while serving another. The authors look at three types of crises: Accidents, scandals, and product safety incidents. They note that a crisis can lead to situations where the demand for action from victims is at direct odds to what shareholders want, or explicitly don't want in some cases. Marcus and Goodman (1991) is the only empirical study that we are aware of that attempts to explore the financial impact of accommodative action.[7] The authors find that accommodative signals benefit victims but hurt shareholders in an accidental crisis,

[7] The accommodative strategy was not limited to apologetic discourse, but instead also included acts of good intent such as donating money to set up an orphanage.

benefit both victims and shareholders in a scandal, and have no significant differentiating effect in a product safety incident. While prior literature provides interesting analyses of crises the results are often limited and hard to compare due to small sample size, the categorization of crisis typologies not grounded in theory, and the identification, or lack of, a response strategy.

[Insert Table 1 here.]

To mitigate these issues we search for crisis management theory that provides a broad analysis of crisis type and response. Research within the crisis management field has been largely unified into a few competing theories.[8] We find that the Situational Crisis Communication Theory (SCCT) developed by Coombs (1995) is the most commonly used in the analysis and discussion of corporate crises that also provides discussion of crisis response strategies. Two strengths of the SCCT that make it appropriate for our current research are the ease of application to quantitative analysis (Sellnow and Seeger 2013) and the theory's design allows it to be predictive rather than descriptive (Coombs 2008). SCCT uses attribution theory as its grounding principle to classify crises by first determining firm responsibility and second suggesting the appropriate response strategy. SCCT is appropriate for our study because of its grounding in attribution theory, which simply put says people inherently want to assign reason to events; they want to be able to explain why something happened. Applied to the crisis management field, we find that victims, shareholders, other stakeholders, and the general public search for causes of crises and seek to lay responsibility with someone or something (Coombs 2006; 2007c).

SCCT centers on how stakeholders initially perceive crisis responsibility. This is a function of the two dimensions of attribution theory: Is the crisis caused by internal or external factors, and is the crisis intentional or unintentional (Coombs 1995)? As expected, a firm suffers more severe damage to its reputation as the two dimensions move from external-unintentional

[8] For a brief discussion of the variety of the theoretical approaches currently used in the study of crisis management and communication see Sellnow and Seeger (2013).

towards internal-intentional (Coombs and Holladay 1996; 2002; 2004; Coombs 1998). The media plays a pivotal role in establishing the initial responsibility by presenting facts and speculating as a crisis unfolds (Coombs 2007a). Selective reporting may highlight only certain negative aspects of a firm while ignoring the positive parts, leading to greater reputational damage to the firm than if the information were presented in its entirety (Coombs 2007a).

Another important factor stakeholders consider when making their initial assessment of crisis responsibility is crisis history. Firms that are repeat offenders can suffer an unwanted shift in crisis responsibility from external to internal and unintentional to intentional (Coombs 2007a). This shift in responsibility to the firm will have a negative impact on the firm's current reputation. Coombs' SCCT considers only "interorganizational" crises, but Elliot (2009) finds that an "extraorganizational" crisis within the same industry can have a positive effect on a firm's reputation. Elliot finds that in an industry with no history of crises, firms are viewed more harshly than in an industry with a history of crises. A crisis prone industry could make firms look more like a victim because potential crises are part of the standard risk of the industry environment, and as a result deflecting responsibility for a crisis away from the firm.

One of the strengths of the SCCT is how it categorizes crises. The SCCT categorizes crises on a spectrum consisting of ten types of crises that increase in level of firm responsibility and recommends appropriate response strategies for a given crisis type. See Table 2 for a categorized list of crisis type clusters and the matching response strategy clusters with brief definitions included in italics. The ten crises are clustered into three groups based upon similar attributes of crisis responsibility. The first category is the victim cluster, which assembles together crises that clearly have little firm responsibility: Natural disasters, rumors, workplace violence, and product

tampering (malevolence). These crises are external and intentional.[9] The second group is the accidental cluster, which puts together crises that are cloudy in firm responsibility: Challenges, technical-error accidents, and technical-error harm. These crises are external and unintentional or internal and unintentional. The third group is the preventable cluster, which groups together crises where the responsibility clearly resides within the firm: Human-error accidents, human-error product harm, and organizational misdeed. These crises are internal and intentional.

Once management establishes how stakeholders will perceive the firm's level of responsibility and assigns the crisis to one of the ten types identified in the SCCT, they must begin working to rebuild the firm's reputation. The SCCT recommends the appropriate response strategy for each crisis cluster. According to Coombs (2007b) a firm can use one of seven response strategies during a crisis. The response strategies have also been clustered into three groups to correspond with the crisis clusters: Deny (victim), diminish (accidental), and rebuild (preventable). The three response groups have been tied to the corresponding crisis cluster around the idea that a firm must ultimately take responsibility and be accountable for its part in a crisis (Coombs 2007a). As crisis responsibility increases the response changes from a defensive stance where management attempts to push liability onto another party to an accommodative stance where management openly admits guilt (Coombs and Holladay 2004; 2005). When a firm chooses a response strategy the firm is reconciling its view of how much liability should be laid with it to the view of how much responsibility stakeholders attributed to the firm.

[Insert Table 2 here.]

For clarification consider two examples from the extreme ends of the ten crisis types. The lowest responsibility crisis that is not the result of nature is "rumor" and the highest responsibil-

[9] Natural disasters pose a slight issue with this classification because it is difficult to say that a hurricane or other natural phenomena is "intentional." Although included in our discussion of SCCT, we do not use any crises brought on by natural disasters. For our purposes we assume rumors are the lowest firm responsibility crisis type.

ity crisis is "organizational misdeed". A rumor like the Pepsi syringe hoax is an external crisis and the CEO has no control over it; thus the responsibility would not be pinned to Pepsi-Cola.[10] In this case the firm is the victim, and so it should adopt a defensive response strategy using either denial or scapegoating. At the other end of the spectrum, an organizational misdeed, like the Enron fraud, is classified as an internal crisis because of noted previous accounting irregularities and the CEOs involvement in orchestrating the fraud; thus the responsibility lies with the firm. According to the SCCT this firm should adopt a rebuild response strategy, or more specifically, it should apologize.

SCCT also considers severity of the crisis an important mitigating factor stakeholders use to ascertain the level of responsibility the firm has for the crisis. The theory states that severity has an incrementally negative effect on firm reputation (Coombs 1998; Coombs and Holladay 2002). Claeys et al. (2010) find that Coombs' theory was correct in positing severity impacted stakeholders perceptions of the firm. Lucero et al. (2009) observe that when the CEO takes a public stand during a crisis it typically shows that the organization views the crisis as severe.

SCCT posits that when firms are faced with a crisis they must respond quickly and effectively. First firms must make an initial assessment of crisis responsibility. They must also take into consideration other factors like the firm and industry crisis history, the firm's reputation, and the amount of media coverage the crisis is generating for the firm. From there firms must execute a strategy to respond to the crisis. The feedback loops among all these variables is complicated so firms can evaluate and conclude their level of responsibility as being low, but by apologizing instead of denying, could increase the external stakeholder assessment of the firm's responsibil-

[10] The hoax began in June 1993 when it was rumored that several cans of Pepsi products contained syringes inside of them. At first the hoax appeared reminiscent of the Johnson & Johnson Tylenol product tampering cases of the 1980s. The claims were quickly found to be false and it was concluded that Pepsi was the victim of con artists trying to extract hush money from the company.

ity. Ultimately these interactions will yield a market response to reputation and stock price. This complex relationship is mapped in Figure 1.

[Insert Figure 1 here.]

The apology strategy is our focus and motivates our basic research question: What is the financial value of an apology? That is, can it help diminish the decline in share price and ultimately begin a road to recovering the lost value attributed to a crisis? This is an important area of research, especially to management that faces a dilemma between moral obligation to apologize to victims and their fiduciary duty to protect the share price for investors (Kaufmann, Kesner, and Hazen 1994; Tyler 1997; Wohl, Hornsey, and Philpot 2011). Apologies are a complex social device, which have recently garnered extensive coverage not just in the crisis management field, but also psychology, sociology, and law.[11]

Apologies are a forward-looking mechanism. Although apologies are for events that transpired in the past, the decision to apologize is primarily driven by motivations to reengage with another party, in some capacity, in the future (Wohl et. al. 2011; Ho 2012). In our view, a firm wishes to engage with stakeholders again in the future. However, it is difficult to gauge the true sincerity of an apology offered by a firm. Corporate apologies are often met with skepticism since it is well known that management's fiduciary responsibility is to maximize profits and keep share prices high (Smith 2008). It is possible the firm's apology to victims is disingenuous; just a tactic to attempt to restore the reputation of the firm (O'Hara and Yarn 2002) making it nothing but a pawn in a game of strategy (Taft 2000).

[11] We include public relations literature with crisis management as they both deal with the relationship of a firm to those outside the firm.

In the apology literature there is discussion about distinguishing between full apologies and partial apologies. Using O'Hara's (2004) synthesized list we say all the following must be present in order for an apology to be considered full:

1) Identification of the wrongful act;
2) Expression of remorse and regret for having committed the act;
3) Promise to forbear from committing the wrongful act in the future;
4) Offer to repair.

An apology that lacks one or more of the four criteria listed above is considered a partial apology. A partial apology would appear more like an expression of concern and regret that avoids taking responsibility and ultimately avoids the risk of legal liability that a full apology carries (Coombs 2007b).

Corporate lawyers tend to advise firms to avoid issuing full statements of apology in order to reduce assessment of legal liability. In crisis management, the legal perspective favors limiting disclosure of information and avoiding, when possible, taking undue responsibility, whereas the public relations perspective, concerned with rebuilding reputation quickly, calls for full and open disclosure (Kaufmann, Kesner, and Hazen 1994; Fitzpatrick and Rubin 1995; Robbennolt 2003; Patel and Reinsch 2003; Coombs 2007b; Coombs and Holladay 2007). Apologizing can also do harm because it could draw attention to a problem that only a select group were originally aware of (Friedman 2006). The risk of legal liability brings with it a real effect on cash flows through litigation costs and settlements entered into with harmed stakeholders.

Issuing a full apology will establish that the firm takes responsibility for the crisis and willingly bears the risk of legal liability. Apologies must be in accord with the overall response strategy since a mixed response from an organization can dampen and even counteract the effectiveness of an apology (ten Brinke and Adams 2013). Apologies are a costly signal to stakehold-

ers (Ho 2012), but credibility is established by apologies having a cost. If they are cheap or free they will be used and abused by insincere offenders (Mungan 2012). Is there a reward associated with the costs/risks?

Prior literature has many examples of how apologies are beneficial, justifying the cost associated with proffering such communication to stakeholders. Sellnow, Ulmer, and Snider (1998) find that when a firm is confronted with a crisis, taking responsibility and apologizing can help them return to their pre-event reputation. Lee, Peterson, and Tiedens (2004) find that management, when faced with a negative event, should take responsibility as it results in a higher stock price when compared to management blaming someone else. Chance, Cicon, and Ferris (2013) find that firms that take responsibility show improvements in profitability post-crisis. Turk et al (2012) find companies that apologize are seen more favorably than those that use a defensive response. Claeys et al. (2010) find that preventable crises have the largest negative effect on reputation, but no distinction can be made between accidental crises and victim crises. Offering an apology leads to the biggest positive change in reputation. Surprisingly, matching crisis response to crisis type, as outlined in SCCT, did not have significant differences on reputation. Finally, the authors find that as crisis severity increases, firm reputation decreases. Mattila (2009) claims that apologies are necessary to restore consumer trust and firm reputation. Patel and Reinsch (2003) note that an apology cannot shield against actual damages levied by a court, but it can be used by the defense to avoid punitive damages. Ohbuchi, Kameda, and Agarie (1989) find that apologizing can help victims restrain their desire to seek revenge by acting aggressively towards those that harmed them.[12]

[12] An example of this comes from the medical field. Doctors, much like a firm, are typically advised not to apologize since an apology could be interpreted as an admission of guilt and used as evidence in a medical malpractice suit. However, some states recognized that to facilitate full healing in victims, an apology is often needed. States that introduced laws protecting doctors from legal liability while offering a full apology to victims and their families saw

At times an apology is clearly the only course of action to be taken. For instance, in situations where the crisis is internal and intentional, like in the case of fraud, an apology is appropriate. However, apologizing may not always be the best response in every situation. Coombs (2007b; 2007c) posits that there is no additional benefit to going beyond what the SCCT says is an appropriate matched response to the current crisis. He continues, saying that using apologies when not warranted under SCCT can actually be harmful as it causes stakeholders to increase their initial judgment of the responsibility of the firm. It may be the case that apologies are not as effective in all situations. Verhoeven et al (2012) found that apology or no apology did not significantly affect trust or reputation of the firm. While Turk et al. (2012) finds that attitudes toward a company were positively affected by a firm's offering of an apology, but more important than the crisis response strategy was the visibility of the CEO and the firm's reputation. De Blasio and Veale (2009) find that no significant difference exists between denial and apology strategies impact on firm reputation. The authors find that not adopting any response strategy, essentially choosing to not comment, was no different than denying or apologizing. McDonald et al. (2010) find that no comment was as effective as confessing in mitigating anger and negative word of mouth. In addition they find that using diminishment response strategies did not reduce assessment of a firm's responsibility for a crisis, but instead actually increased assessed responsibility. They also find that between the two dimensions of attribution theory within SCCT, the internal-external relationship is the best predictor of anger, sympathy, and negative attitude. Brocato, Peterson, and Crittenden (2012) find that CEO's individual reputation benefited more than the firm's reputation from offering an apology. This can be a cause for concern because management may ignore the costs of apologies in order to position them for future success. Coombs and Holladay (2008) find that an apology may be unnecessary in situations where there

significant decreases in malpractice settlement times and on average the settlement payment decreased by $32,342 (Ho and Liu 2011a; 2011b).

are low to moderate levels of firm responsibility. Offering words of sympathy or compensation results in the same reaction from non-victim stakeholders.[13]

2.2 Hypotheses

Because a firm is engaged with so many different and diverse stakeholders, management must carefully initiate a crisis management strategy that takes into account the varying wants and needs of stakeholders. We assume that markets are semi-strong form efficient and therefore incorporate all publically available information into share price. For our study this assumption means that how the market reacts to a crisis and then reacts to the firm's response incorporates all publically available information about the firm, the crisis, and expectations of the future. Thus, we return to our original research question: Can an apology have financial value? After reviewing the literature on crisis management and apologies we formulate the following testable hypotheses based on our original research question:

HYPOTHESIS 1: *Apologizing has a negative effect on stock return for victim or accidental crises post-crisis.*

HYPOTHESIS 2: *The negative stock return effect from apologizing is mitigated as the firm's responsibility for the crisis increases.*

HYPOTHESIS 3: *The negative stock return effect from apologizing is greater as the severity of the crisis increases.*

3. Methods and Data

3.1 Generalized Methods

An important measure when assessing the economic impact of a specific corporate action or event is how the market interprets this new information. In our study we want to see how the market reacts first to the news of a crisis and then subsequently to an apology offered by the

[13] The authors note that these results may be driven by the use of an accidental crisis in their study, which may make assigning blame more difficult.

company in response to the crisis. We use standard event study methods to look at how returns are impacted by these two events. Event study methods are widely accepted in the accounting and finance literature, and it has been used to study stock splits, mergers, earnings announcements, and other significant market events. It allows us to assess the effect of an event on the wealth of shareholders, which in turn can help managers make corporate policy decisions (Kothari and Warner 2007). We provide a generalized discussion of the process involved in an event study, based on the processes as described by Campbell, Lo, and MacKinlay (1997) and MacKinlay (1997).[14] Following the general discussion we will present more detailed formal equations.

To conduct an event study we must specify three distinct non-overlapping windows: Estimation window, event window, and post event window. Data is assigned to one of these three windows by event time rather than calendar time. Event time is based on an anchor known as event day zero. The estimation window is used to calculate the expected return, as measured by the single-index market model, under normal market conditions (no news). We use the value-weighted index from the CRSP database as our market proxy to calculate the intercept and beta.[15] We then use the intercept and beta to generate expected returns in the event window. The event window is the window that includes the event of interest. Various short-term event windows are created based off the anchor date. We calculate abnormal returns in these windows.

The abnormal return is the difference between actual returns and expected returns as predicted from the single-index model. Daily returns are calculated as the change in price between the stock today and the previous day. This positive or negative change reflects a market adjustment to the firm's potential profitability. Thus, we can capture the impact of the event by looking

[14] Both papers build off of the seminal event study work of Brown and Warner (1980; 1985).

[15] We also tried using the equal weighted index and the S&P500 as our market proxy and found no significant differences in the individual CARs or in our cross-sectional regression results.

at what we would expect a normal return to be assuming the event had not taken place and compare it to the actual return.

Abnormal returns by themselves will not paint a full picture of market reactions because of the possibility that not all market participants have access to information immediately. It is also possible that some investors will react immediately and decisively whereas others may take time to interpret this new information and update their prior beliefs. Finally, it may be that the market overreacts and then a correction happens over the days following the event. Regardless of the reason, using a single day's abnormal return will not reveal the full impact of a crisis. Using cumulative abnormal returns (CAR), which is the summation of ARs across the event window, gives us the ability to see information dissemination over several days following the crisis or apology instead of the crisis/apology date alone.

AR and CAR are both generated for individual firms. Once we have calculated both of these numbers we can group firms into different portfolios based on one or more characteristics. In our study we group firms by apology/non-apology. When they are grouped we then test the significance of the individual portfolio's return by taking the portfolio's CAR and dividing it by the portfolio's standard deviation. We also test the difference in means between the two portfolios to assess that the distinguishing feature of apologies has explanatory power in determining CAR. This allows us to make some assertions about how an apology drives returns. However, we cannot rely solely on this approach to test our hypotheses.

Cross sectional regression analysis is used to isolate the effect an apology has on CAR. We specify a linear regression model to explain the CARs observed in the event windows around the crisis and around the apology. The regression considers apology and other main effect variables that may be related to CAR as well as some standard controls used in the accounting and finance literature. The rationale for and the calculation of these variables will be discussed in

more detail below. The regression is estimated using ordinary least squares (OLS) with robust standard errors.[16]

3.2 Cumulative Abnormal Return

To begin we specify the estimation window and the five event windows used in this study. Figure 2 is provided as a visual aid to assist with understanding the event anchor and relative references. In the first study the crisis is assigned an event date of zero. It is referred to as τ. The estimation window consists of the two hundred and fifty trading days between -270 (τ_{-2}) and -20 (τ_{-1}) event days prior to the crisis. The event window is formalized as the trading days from the crisis (τ) to a pre-specified endpoint (τ_{+1}). We use five event windows as follows: [0,+2], [0,+5], [0,+10], [0,+15], and [0,+20]. With specification of our estimation window and five event windows we can calculate the AR and CAR for each firm using equation (1) and (2) respectively.

[Insert Figure 2 here.]

$$\widehat{AR}_{i_t} = \mathrm{R}_{\mathrm{i_t}} - \left(\widehat{\alpha}_{\mathrm{i}} + \widehat{\beta}_{\mathrm{i}}\mathrm{R}_{\mathrm{M_t}}\right) \tag{1}$$

$$CAR_i(\tau, \tau_{+1}) = \sum_{\mathrm{t}=\tau}^{\tau_{+1}} \widehat{AR}_{i_t} \tag{2}$$

As the primary goal of our study is to see if an apology is positively or negatively received by the market we create two portfolios. Each portfolio is constructed by taking the average CAR of all the firms that meet the characteristics of that portfolio. The generalized formula is:

$$\overline{\mathrm{CAR}}_{\mathrm{p}}(\tau, \tau_{+1}) = \frac{1}{\mathrm{n}}\sum_{\mathrm{i}=1}^{\mathrm{n}} \widehat{CAR}_i(\tau, \tau_{+1}) \tag{3}$$

[16] Robust standard errors are used because the cross sectional results showed biasing from heteroskedasticity. Robust standard errors correct for this inconsistency in variance.

The two portfolios are differentiated by the presence of an apology by the firm during the event window, $\overline{\mathrm{CAR}}_{\mathrm{A}}(\tau, \tau_{+1})$, or no apology by the firm during the event window $\overline{\mathrm{CAR}}_{\mathrm{NA}}(\tau, \tau_{+1})$. It is important to note that the firms in the apology and non-apology portfolios are not static over the five event windows. As time moves farther from the crisis date some firms switch from being in the non-apology group to joining the apology group. Once we have separated our sample into two distinct groups we test to see if their respective CARs are statistically significant. To do this we must standardize the returns as shown in equation (4):

$$\widehat{\mathrm{SCAR}}_{\mathrm{P}} = \frac{\overline{\mathrm{CAR}}_{\mathrm{p}}(\tau, \tau_{+1})}{\widehat{\sigma_{\mathrm{P}}}(\tau, \tau_{+1})} \tag{4}$$

where: $\widehat{\sigma_{\mathrm{P}}}(\tau, \tau_{+1}) = \sqrt{\frac{1}{\mathrm{N}^2}\sum_{\mathrm{i}=1}^{\mathrm{n}} \hat{\sigma}_i^2(\tau, \tau_{+1})}$

Finally we want to infer if there is a difference between the apology group and the non-apology group. We perform a difference of means test as follows:

$$\mathrm{DIF}(\tau, \tau_{+1}) = \frac{[\overline{\mathrm{CAR}}_A(\tau, \tau_{+1}) - \overline{\mathrm{CAR}}_{NA}(\tau, \tau_{+1})]}{\sqrt{\frac{\hat{\sigma}_A^2(\tau, \tau_{+1})}{\mathrm{N}_1} + \frac{\hat{\sigma}_{NA}^2(\tau, \tau_{+1})}{\mathrm{N}_2}}} \tag{5}$$

Once we establish if there exists a basic separation between apology and non-apology we turn to cross sectional regression analysis to further explore how an apology affects share price in a crisis.

3.3 Cross Sectional Regression

We use cross sectional regression analysis as it allows us to control for firm and crisis characteristics to determine if it is in fact the decision to apologize that is driving returns, or if apology is a proxy for some other factor(s). We present the main regression below (equation (6)) and then proceed to define the variables used in the regression. In section 5 we perform robust-

ness tests that focus on parts of equation (6) to show that our results are not spurious, or created by variable measurement error, or model misspecification issues.

$$\widehat{CAR}_i(\tau, \tau_{+1}) = \alpha_i + \beta_{1i} PREVENTABLE + \beta_{2i} FATALITIES + \beta_{3i} APOLOGY + \beta_{4i}(APOLOGY * PREVENTABLE) + \beta_{5i}(APOLOGY * FATALITIES) + \sum_{k=6}^{K} \beta_{ki}\, CRISIS\ CONTROLS_i + \sum_{J=11}^{J} \beta_{Ji}\, FIRM\ CONTROLS_i + \varepsilon_i \quad (6)$$

3.3.1 Independent Variables

PREVENTABLE

Preventable crisis is a dummy equal to 1 if the firm's crisis could be classified as one of the three crisis types that make up the preventable crisis cluster as outlined in the SCCT.[17] In this case the firm is identifiably responsible for the crisis and we expect to see a negative effect on CAR. We chose to make non-preventable crisis (accidental crisis and victim crisis) the base group in our sample for two reasons. In non-preventable crises assigning blame can be ambiguous and lead to mixed interpretations of information yielding dispersion in the level of responsibility levied against the firm and in a victim crisis it is very clear that the firm is not responsible and that apology is not the best response. We assume that a firm in a preventable crisis that apologizes will experience positive results whereas a firm that apologizes in an accidental or victim crisis (hereafter referred to only as a non-preventable crisis) will experience negative results.

[17] When classifying crises it is possible that we misclassify the crisis into the wrong category. Although unlikely, crisis misclassification is only upwards (we attributed higher responsibility for the crisis to the firm than should have been) and should not significantly impact our results.

FATALITIES

Fatalities is a dummy equal to one if there are deaths that occurred because of the crisis.[18] We obtain information on fatalities from government sources where available and then from media reports if no government information is available. Prior literature has found that fatalities are a significant driver of returns and the mere presence of them increases severity of the crisis, which in turn can increase the amount of responsibility that is assigned to the firm (Borenstein and Zimmerman 1988; Mitchell and Maloney 1989; Broder and Morral 1991; Knight and Pretty 1999; Walker, Theifgtham, and Lin 2005; Walker, Pukthuanthong, and Barabanov 2006; Capelle-Blancard and Laguna 2010; Carpentier and Suret 2013). In our model we assume fatalities are a proxy for the severity of the crisis. Consistent with prior findings we expect that fatalities will have a negative effect on CAR.

APOLOGY

Apology is a dummy variable equal to 1 if a firm apologizes on any day within the event window. If an apology is offered on a non-trading day, for example the weekend or a holiday, the next available trading day is used in its place. This variable and all its interactions are the focus of our study. We expect that apologies will have a negative relation with CAR except in the situation where the firm is responsible for the crisis, in which case CAR will be positively affected.

3.3.2 Control Variables – Crisis Level

PREVIOUS FIRM CRISIS

Previous firm crisis is a dummy variable set to one if the firm has had any type of previous crisis. This is consistent with Borenstein and Zimmerman (1988), Elliot (2009) Lucero, Kwang, and Pang (2009), Capelle-Blancard and Laguna (2010), and Carpentier and Suret (2013).

[18] We also tried using the total number of deaths reported as well as the natural log of the total number of deaths. We find that our regression results do not significantly change when using the three different measures for fatalities. For simplicity in interpreting the regression results we elect to use the dummy on fatalities.

The presence of a previous crisis may cause stakeholders to evaluate the current crisis and management's response in a more negative light since it appears that something inherent in the company is risky. Consistent with prior empirical literature and the SCCT we expect to find a negative relation between previous firm crisis and CAR.

PREVIOUS INDUSTRY CRISIS

Previous industry crisis is a dummy variable equal to one if the firm is in an industry that has had a previous crisis in the same category at some point in its history. Controlling for industry crises is consistent with Borenstein and Zimmerman (1988). Industry is measured using the 4-digit Standard Industrial Classification (SIC) code. From Elliot (2009) we expect that a firm that is in an industry where crises are common place will have some onus of responsibility lifted from it and conversely, will be viewed more harshly if it is in an industry with little to no history of crises.

REPUTATION

Reputation is the most recent score prior to the crisis reported in Fortune magazines annual "World's Most Admired Companies." Fortune magazine has published the results of this annual survey since 1983. Fortune asks senior executives, directors, and security analysts to respond to a survey that rates the 10 largest companies in their own industries on several scales. The survey uses an 11-point scale, where 0 = poor and 10 = excellent, on eight attributes of reputation. These attributes are quality of management; quality of products or services; innovativeness; long-term investment value; financial soundness; ability to attract, develop, and keep talented people, responsibility to the community and the environment; and wise use of corporate assets. The firm's reputation score is calculated as a simple average of the eight attributes.[19] Use of the Fortune scores is in congruence with prior literature (Fombrun and Shanley 1990; Roberts

[19] Fortune does not provide the individual scores of each attribute in its publication.

and Dowling 2002; Chen, Ganesan, and Liu 2009). For any firm that is missing a score we use the industry average for that year, similar to Chen, Ganesan, and Liu (2009). As a firm reports a higher comparative score we can say that it has a better reputation. We expect to find a positive relationship between a firm's reputation and their respective cumulative abnormal return.

PUBLICITY

Consistent with Borenstein and Zimmerman (1988), Fombrun and Shanley (1990), Knight and Pretty (1999), Capelle-Blancard and Laguna (2010), Yu, Ho Meng-Keng, Ton, and Fadjiar (2012), Carpentier and Suret (2013), ten Brinke and Adams (2013) we seek to capture abnormal media coverage as a result of the crisis. We construct a ratio of average daily media coverage during the crisis to average daily media coverage pre-crisis as presented in equation (7). This measurement only captures abnormal media coverage and does not distinguish between good and bad media reports. We used the ABI Global database to search for company names and related words such as stock ticker to calculate the number of times the company was mentioned in the media during our windows of interest. We restrict the search to only look for key words in abstracts of major newspapers like the Wall Street Journal. We then perform the exact same search but over the period of the event window. Both of these numbers are divided by the number of days in the appropriate window to arrive at an average daily number. The difference between the log publicity in the event window and the log publicity in the estimation window is then calculated which gives us our measure of abnormal publicity as defined in equation (7).

$$Log\left(\frac{count\ of\ news\ articles\ (\tau,\tau_{+1})}{number\ of\ days\ (\tau,\tau_{+1})}\right) - Log\left(\frac{count\ of\ news\ articles\ (\tau_{-2},\tau_{-1})}{number\ of\ days\ (\tau_{-2},\tau_{-1})}\right) \qquad (7)$$

VOLUME

Volume captures abnormal trading volume. We calculate abnormal trading volume similar to Chae (2005) by taking the difference between the log turnover in the event window and the

log turnover in the estimation window. Turnover is defined as the trading volume for a firm divided by the number of shares outstanding. See equation (8).

$$Log\left(\frac{Avg.trading\ volume(\tau,\tau_{+1})}{\substack{Avg.shares\\ outstanding(\tau,\tau_{+1})}}\right) - Log\left(\frac{Avg.trading\ volume(\tau_{-2},\tau_{-1})}{\substack{Avg.shares\\ outstanding(\tau_{-2},\tau_{-1})}}\right) \quad (8)$$

This measure makes trading volume comparable across firms by eliminating biases due to size. The turnover is logged to correct for the extreme skewness and kurtosis noted by many researchers that exists within trading volume and thereby create a distribution that is closer to normal.[20] We expect that as a crisis draws more attention to the firm, it will simultaneously lead to increases in trading volume and losses in share value, which should be expressed in our regression with a negative coefficient for trading volume.

3.3.3 Control Variables – Firm Level

SIZE

Firm size is measured as the natural logarithm of market capitalization the day prior to the crisis. To make the number comparable across time we adjusted the market capitalization to 2011 dollars before taking the logarithm. Use of market capitalization to capture size is consistent with previous literature (Walker, Thiengtham, and Lin 2005; Walker, Pukthuanthong, and Barabanov 2006; Chen, Ganesan, and Liu 2009; Capelle-Blancard and Laguna 2010; Carpentier and Suret 2013; Chance, Cicon, and Ferris 2013; ten Brinke and Adams 2013). We expect that relatively larger firms will realize a dampened negative impact on share price, as a larger firm is more capable of handling any costs associated with a crisis relative to a smaller firm. However, larger firms will more likely suffer larger crises. Therefore, we have no expectation on the relationship between SIZE and CAR.

[20] See Bamber, Barron, and Stevens (2011) for a comprehensive review of trading volume literature.

LEVERAGE

Debt-to-assets (D/A) is used as a proxy to control for leverage/risk. D/A takes into account the level of debt for firms, which may impact the capital markets' reaction to a crisis. We expect that for firms with a high level of debt, CAR will be negatively affected because shareholders fear the firm becoming insolvent and ultimately bankrupt as a result of the crisis. However, shareholders may be able to appropriate wealth from debt holders meaning shareholders loss in value will be dampened. Use of the D/A ratio is consistent with recent studies (Luchs, Stuebs, and Sun 2009; Mio and Fasan 2012; Chance, Cicon, and Ferris 2013).

MARKET-TO-BOOK RATIO

Consistent with prior literature (Fombrun and Shanley 1990; Roberts and Dowling 2002; Luchs, Stuebs, and Sun 2009; Mio and Fasan 2012; Chance, Cicon, and Ferris 2013) the market-to-book ratio captures the value of intangible assets impounded into the share price by the market. Intangible assets may serve as an additional reserve for firms to draw on when faced with a crisis. We expect a higher M/B ratio to help insulate a firm during a crisis and thus lead to higher CARs. M/B is also a proxy for growth, which means higher levels of M/B means firms have more to lose.

INDUSTRY FIXED EFFECT

Since our sample spans many industries we control for industry specific effects. Prior studies controlled for industry effects by creating a dummy for companies operating in oil/gas/petrochemical/chemical industry (Knight and Pretty 1999), a dummy if a company is in the oil industry or electric industry (Jones and Rubin 2001), a dummy if a company is in chemical sector or oil industry (Capelle-Blancard and Laguna 2010), the Industry Classification Benchmark Level 1 (Mio and Fasan 2012), the Fama-French twelve industry classifications (Chance, Cicon, and Ferris 2013; Bonini and Boraschi 2010), a ten sector model (Luchs, Stuebs,

and Sun 2009), and the two digit SIC codes (Schnietz and Epstein 2005; Fombrun and Shanley 1990). We use the Fama-French twelve-industry classification system. We have no stated expectations for specific industries.

YEAR FIXED EFFECT

Also of concern with our sample is the long time period it covers. To mitigate potential problems based on when the crisis happened we control for the year in which the crisis occurred. Prior literature has used different controls for year effects (Borenstein and Zimmerman 1988; Jones and Rubin 2001; Capelle-Blancard and Laguna 2010). We create ten unique groups that are constructed in three-year increments starting in 1983 and ending in 2013. We elect to use this method of grouping to create some variance between different time periods in our sample while not letting each year be individually represented as some years contained only one crisis and this over-specification could cause issues with interpreting our regression results. We also group together years since our time period is so large it would eat up over thirty degrees of freedom. We have no stated expectations for specific years.

3.4 Sample Acquisition, Characteristics, and Description

3.4.1 Sample Acquisition

We identified crises by combining the samples used in previous literature thus far referenced and by searching government sources identified in previous literature as well as private organizations and databases.[21] We identified three hundred and forty one unique crises between 1983 and 2013. We obtained stock market data relating to returns, trading volume, shares outstanding, and SIC codes from the CRSP database. We dropped twenty-one firms due to missing data from CRSP. Financial and accounting data, including total assets and total liabilities was

[21] Government sources include National Transportation Safety Board, U.S. Chemical Safety Board, and the Securities and Exchange Commission. Private sources and databases include the Institute of Crisis Management Annual Newsletter (for the years 1991-2011) and the Conflict, Culture, and Memory Lab Public Apology Database hosted by the University of Waterloo's Department of Psychology.

collected from COMPUSTAT. An additional six firms were dropped due to missing COMPUSTAT data. We then collected the results of Fortune's "World's Most Admired Companies" list. We dropped any firm that did not have a reported score on the list and an industry average score was not available. This reduced our sample by an additional twenty-two firms leading to a final sample of two hundred and ninety-two firms. After careful consideration we purposely chose to exclude crises arising from accounting frauds, which differ from conventional crises in three main ways. First, because the list of firms involved in accounting scandals was obtained from the Securities and Exchange Commission website, it is almost certain that these firms will not apologize as doing so during an investigation would guarantee a verdict against the firm. Second, within our sample of firms only one, WorldCom, had apologized, but it did so at a time when its stock would be classified as a penny stock, which by its very nature is highly volatile and makes meaningful analysis difficult. Third, the focus of our study is how the market reacts to crises, but we must be careful to distinguish between shareholders as stakeholders and shareholders as victims. In the case of fraud, shareholders and victims are not mutually exclusive. Removing these firms from our sample reduces the total number by fifty-seven, leaving a final sample size of two hundred and thirty-five. These remaining firms were then reviewed to determine: Type of crisis, if the firm apologized, firm's prior crisis history, and if fatalities resulted from the crisis.

3.4.2 Sample Characteristics and Descriptive Statistics

Table 3 reports the qualitative characteristics of our sample. Panel A presents the breakdown of crisis types. Our sample consists of roughly 22.5% preventable crises and 77.5% non-preventable crises. Of the preventable crises, 28% offer an apology whereas for the non-preventable crises only 12% apologize. Finding that apologies are more frequent for preventable crises would appear to indicate that management is already following the recommendations out-

lined in the SCCT. Turning to Panel B we find that crises in our sample resulted in fatalities nearly 43% of the time, but that only 5% of firms apologized when fatalities were present. Looking at firm and industry crisis histories (Panel C) we find that 42% of firms had a previous crisis in our sample and 71.5% operated in an industry which had at least one prior crisis in the sample. Looking at the breakdown of industries (Panel D) and years (Panel E) we note that we have at least one observation in all of the industries and all of the years. There are some cases where there is no firm that apologizes in the industry (chemicals and utilities) and only one-year group that has no apologizes (1983-1985). The rise of the use of apologies has been a recent phenomena, which can be seen by looking at the number of apologies offered in the years 1983-2006 and comparing it to 2007-2013. Our sample also appears to show that the frequency of crises has increased in more recent years. Although this may be true, it is more likely that recent crises are well documented through social media, blogs, and other mediums that democratized the coverage and dissemination of news.

[Insert Table 3 here.]

Table 4 presents the descriptive statistics for our sample. We find that the mean return declines as the event window widens up to the 15 day window and then reverses direction by the 20 day window to end slightly higher, but still negative. We tested the means to see if they were different from zero and found that for all five windows it is statistically significant at the 1% level. This finding is a good first step in our study as it allows us to feel confident that our crises firms are behaving how we would expect based off of findings in previous literature (see Table 1). We also test to see if the distribution of CAR is normal and find that based on skewness and kurtosis tests, that we can conclude the distribution is not normal. This is not surprising since event studies using daily data are often non-normal in their distribution (Brown and Warner 1985). We conduct the same mean and distribution tests on the other continuous variables in our

sample and find that for nearly all of our variables the mean is statistically different from the expected mean and is not normally distributed.[22] This finding is surprising for PUBLICITY and VOLUME as both are logged variables which should force its distribution closer to normal, meaning that the raw data was so highly skewed that even the log transformation could not fix the non-normality of the distribution. We do not perform any other transformation or manipulation of the variables.

[Insert Table 4 here.]

Finally we look at the correlations of our variables. Table 5 presents the Pearson correlation table for the full sample of 235 firms. Only correlations relevant to equation (6) are reported. Of notable interest are the moderate levels of correlations scores between variables. Looking at the extreme ends of our correlation range we find that REPUATION AND SIZE have a positive correlation of 0.55 and that CAR[0,+2] and VOLUME[0,+2] have a negative correlation of -0.48. All of our correlation scores are of a moderate level with no extreme values, we still perform some sensitivity tests amongst variables that have, within our sample, relatively high correlations by rerunning our main regression with one variable dropped and then the other. We find that APOLOGY has a positive and statistically significant relationship with PREVENTABLE CRISIS (the correlations range from 0.14 to 0.19, depending on the event window) that seems to indicate management is already following the guidance of SCCT. We also find that APOLOGY has a negative and statistically significant relationship with FATALITIES (correlation ranges between -0.16 and -0.26, depending on the event window) giving some credence to hypothesis 3. Other notable correlations include CAR and PUBLICITY (correlation ranges between -0.18 and

[22] For some variables, like REPUTATION, because it is a scale of 11 possible choices range from 0 to 10, we would not expect the mean to be zero, but rather that it should be 5.5 (assuming REPUTATION is a normal distribution). For PUBLICITY and VOLUME, we assume that the expected mean should be equal to log(1.01) For firm specific controls we find the average value of SIZE, LEVERAGE, and MARKET-TO-BOOK for the S&P 500 and use that as our expected value.

-0.38, depending on the event window) as well as CAR and VOLUME (correlation ranges between -0.19 and -0.48, depending on the event window). In both cases a negative and statistically significant correlation exists between the variables. These two findings support our priori beliefs about how increased media coverage/investor attention would lead to more scrutiny of the firm and result in lower share price. We also find a positive and significant relationship between PUBLICITY and VOLUME (correlations range between 0.15 and 0.37, depending on the event window). To test for concerns that there is too much overlap in these variables we perform sensitivity tests on our model by including and dropping one and then the other. This is discussed in our results section. The same concern of non-orthogonality between PREVIOUS FIRM and PREVIOUS INDUSTRY (correlation of 0.54) arises when looking at the correlation between the two variables. Again we perform the same sensitivity test on our model by including one and dropping the other. Among our control variables we find that REPUTATION and SIZE (correlation of 0.55) have a positive correlation that could be capturing the fact that how big a firm is leads to more awareness of the firm, and that this increased presence translates into a better reputation.

[Insert Table 5 here.]

4. Results

4.1 Event Study

Table 6 (Panel A) reports the cumulative abnormal returns for the full sample of firms and also reports the returns for the apology and non-apology portfolios. On average, shareholders suffer a statistically significant loss of 1.783% in the first two days post crisis [0,+2], 2.654% in the first five days [0,+5], 2.638% in the first ten days [0,+10], 3.158% in the first fifteen days [0,+15], and 2.708% in the first twenty days [0,+20]. All these CARs are significant at the 1% level. The sign and magnitude of our results are similar to those reported by previous studies

(Broder and Morrall 1991; Knight and Pretty 1999; Walker et. al. 2005; Walker et. al. 2006; Capelle-Blancard and Laguna 2010; Carpentier and Suret 2013).

When we divide our sample into the apology and non-apology portfolios we find that a large gap exists between the two groups, with apologies suffering a larger loss in shareholder value than non-apologies. The size of the apology and non-apology portfolios can be found at the bottom of Table 7 for the respective windows. For firms that offer an apology in response to a crisis we find that on average shareholders suffer losses of 7.763%, 8.117%, 5.397%, 4.559%, and 4.382% in the two-day, five-day, ten-day, fifteen-day, and twenty-day event windows, respectively. All these CARs are significant at the 1% level. From this we can observe that by the five-day window, losses to apologetic firms hits a maximum and then a path to recovery begins. Indeed, Figure 3 shows that the one-week window is the local minimum of the function. We can also see that the apology portfolio has a much larger initial shock relative to the non-apology portfolio on the day of the crisis and experiences higher levels of volatility throughout the twenty event days in the graph. The trend line reveals that after the initial shock the overall effect of an apology is positive, and that by day twenty the firms have on average regained nearly half of their lost value.

[Insert Table 6 here.]

[Insert Figure 3 here.]

Similar to the apology portfolio, we find that the non-apology portfolio suffers losses with an identifiable local minimum. For firms that do not offer an apology in response to a crisis we find that on average shareholders suffer a loss of 1.376%, 2.090%, 2.218%, 2.896%, and 2.395% in the two-day, five-day, ten-day, fifteen-day, and twenty-day event windows, respectively. All these are significant at the 1% level. These results show that firms who choose an alternative response strategy to apology when faced with a crisis also suffer losses, but not at the

same magnitude as the apology firms. We also find that the declining value to shareholders has a longer persistence level. For the non-apology portfolio, a reversal in direction does not occur until the fifteen-day window, whereas the apology portfolio shows signs of beginning recovery in the five-day window. This relationship is apparent when we look at the non-apology portfolio in Figure 3.

Figure 3 shows that the initial large spread in returns between the two portfolios narrows as time progresses. We test to see if the difference between the two portfolios is statistically significant in the various event windows. The result of the difference in means test is presented in Table 6 (Panel B). We find that a statistically significant ($p < 0.01$) difference in means between apology and non-apology firms exists with differences of 6.388%, 6.026%, 3.179%, 1.663%, and 1.987% in the two-day, five-day, ten-day, fifteen-day, and twenty-day windows, respectively. Given the significant spread between the two portfolios and with the apology portfolio having CARs below that of the non-apology portfolio we conclude that apologizing has a negative impact on share price both in isolated analysis and in comparison to a strategy that does not include apologizing.

Our event study results suggest that firms that apologize will suffer losses much larger than firms that choose to adopt a strategy other than apology. To test whether some causal variable(s) could describe how apologies lead to larger losses we look at the results from our cross sectional regression. The regression specified in equation (6) will allows us to see if apologizing always leads to a loss in value by controlling for factors specific to the crisis and specific to the firm.

4.2 Cross Sectional Regression Results

Our event study results suggest that a firm offering an apology leads to more negative stock returns compared to using an alternative response strategy. To test whether some causal

variable(s) could explain this variation in returns we regress numerous explanatory variables on CAR as specified in equation (6). The results of this regression can be found in Table 7. The observed coefficients along with their respective robust standard errors are valuable as they allow us to examine the impact of a particular crisis or firm characteristic (variable) while keeping the impact of all other variables constant. We calculate the variance inflation factor to test for multicollinearity and find that there is no indication of multicollinearity amongst the variables in our model. We discuss the results found in Table 7 in the order they are presented.

[Insert Table 7 here.]

PREVENTABLE CRISIS has a negative and significant relationship with a firm's CAR. We find losses in value of 2.28% ($p < 0.01$), 3.00% ($p < 0.05$), 4.04% ($p < 0.05$), 4.28% ($p < 0.10$), and 4.70% ($p < 0.05$) in the two-day [0,+2], five-day [0,+5], ten-day [0,+10], fifteen-day [0,+15], and twenty-day [0,+20] event windows, respectively. This seems to indicate that as a firm's responsibility for a crisis increases, the market penalizes the stock more. This is consistent with SCCT and the findings of Claeys et al. (2010).

FATALITIES also has a negative and significant relationship with a firm's CAR. We find losses of 1.83% ($p < 0.05$), 2.58% ($p < 0.01$), 2.98% ($p < 0.05$), 2.98% ($p < 0.10$), and 3.05% ($p < 0.10$) in the two-day, five-day, ten-day, fifteen-day, and twenty-day event windows, respectively. These results appear to indicate that as the severity of the crisis increases, (when deaths are attributable to the crisis), the market adjusts the share price downward. This is not surprising and it is consistent with prior literature (Mitchell and Maloney 1989; Walker, Theifgtham, and Lin 2005; Walker, Pukthuanthong, and Barabanov 2006; Capelle-Blancard and Laguna 2010; Carpentier and Suret 2013).

The coefficient on APOLOGY represents the effect of offering an apology in response to a non-preventable crisis holding everything else constant. As expected, APOLOGY has a nega-

tive and significant relationship with a firm's CAR. An apology leads to losses of 6.85% ($p < 0.10$), 6.85% ($p < 0.05$), 5.37% ($p < 0.10$), and 7.20% ($p < 0.05$) in the five-day, ten-day, fifteen-day, and twenty-day windows, respectively. These results suggest that offering an apology for a crisis that a firm is not clearly responsible for causes the market to react negatively, driving share price, and thus shareholders wealth, down. This reinforces our univariate results.

In our model APOLOGY is a moderating variable, which we also use to construct two-way interactions for crisis type (APOLOGY * PREVENTABLE CRISIS) and severity (APOLOGY * FATALITIES). We believe APOLOGY is a moderating variable because it is a response to the crisis and therefore information about crisis type and severity are known. Our hypotheses specifically state that apologies have a moderating effect through crisis type (hypothesis 1 and 2) and severity (hypothesis 3). To test the significance of this moderator we look at the significance of the corresponding coefficient in our regression (Dawson 2014).

We find that when a firm is responsible for the crisis and apologizes (APOLOGY * PREVENTABLE CRISIS) shareholder's wealth is positively affected by 11.29%, 10.29%, 10.61%, 9.35%, and 11.62% in the two-day, five-day, ten-day, fifteen-day, and twenty-day windows, respectively. All these are significant at the 5% level. Our results suggest that as a firm's responsibility for a crisis increases, an apology has a more positive effect regardless of the size of the event window. This relationship can also be presented using a 2-way interactions graph for ease of interpretation.

Figure 4 presents the moderating effect of an apology on crisis type. Since both crisis type and apology are dummy variables it limits the interpretive power of the figure to showing only directional relationships. As both variables are non-continuous, the slope gradients are irrelevant, but we can conclude that the two lines are statistically different from each other because the interaction term is significant (Dawson 2014) as noted in Table 7. Figure 4 shows what Table

7 has revealed: As the firm's responsibility for a crisis increases (decreases) apologizing has a positive (negative) effect, as represented by the dotted line, compared to not apologizing, as represented by the solid line.

[Insert Figure 4 here.]

We now look at the moderating effect of apology on severity of crisis. For APOLOGY * FATALITIES we do not find any statistically significant coefficients across any of the five event windows. This implies that an apology has no differential impact on CAR when there are fatalities associated with the crisis.

In addition to testing individual coefficients we consider four comparisons: 1) Apology versus non-apology for preventable crises; 2) apology versus non-apology for non-preventable crises; 3) apology versus non-apology for fatalities; and 4) preventable versus non-preventable for only apologetic firms. Table 8 presents the comparisons being tested using the Wald Test and reports the F-statistic and its associated p-value.

The results in Table 8 suggest that an apology has the biggest impact when the crisis is non-preventable and the least impact when the crisis is preventable. For example, if a crisis is preventable, the response strategy is irrelevant regardless of the event window. On the other hand, for non-preventable crises an apology has a significantly negative impact on CAR relative to non-apology in each of the event windows starting with the five-day window. We observe F-stat values of F = 3.59 ($p < 0.10$), F = 4.26 ($p < 0.05$), F = 3.33 ($p < 0.10$), and F = 3.93 ($p < 0.05$) in the four event windows respectively. An apology is also irrelevant when there are fatalities unless it is offered within the first two-days (F = 4.25; $p < 0.05$). Finally, within the apology group, the responsibility is only a significant mediating factor in the ten-day event window issue in the ten-day event window (F = 3.01; $p < 0.10$).

[Insert Table 8 here.]

The results in Table 7 and Table 8 reveal a few interesting consequences of offering an apology during a crisis. First, the negative effect of apologizing is reduced as the level of responsibility increases. In fact, the negative effect of apologizing is eliminated for preventable crises. One explanation for this is that the act of apologizing does not force additional responsibility for the crisis onto the firm, but merely confirms what the market already assumed. Thus, no new news means insignificant differences between apologetic and unapologetic firms. However, in the case of a non-preventable crisis, the market is surprised by an apology from the firm, which imposes additional responsibility on the firm not previously reflected in the share price and in turn drives the share price down. Finally, apologizing in the presence of fatalities only appears to affect the immediate market response. Overall we can say that apologizing has no moderating effect on the financial cost of the severity of the crisis.

We now turn our discussion to the crisis control variables. We find that PREVIOUS FIRM CRISIS is not statistically significant across any of the event windows.[23] For PREVIOUS INDUSTRY CRISIS we find that a positive relationship exists between a history of crisis in the industry and firm CAR. We find that in the two-day, five-day, ten-day, and fifteen-day windows, a firm in an industry prone to crises had CARs that were 2.69% ($p < 0.05$), 2.46% ($p < 0.10$), 3.06% ($p < 0.10$), and 3.87% ($p < 0.05$) higher, respectively. This finding appears to confirm our expectation that the market would be more lenient on firms operating in an industry with a history of crises (Elliot 2009). Surprisingly, REPUTATION was not significant across any of the event windows. This is surprising since reputation is so heavily discussed in the SCCT and used in many empirical papers. One possible explanation for this observation may be due to the use of industry averages for firm's missing a score for any given year. Another explanation may be the correlation between REPUTATION and SIZE (0.55). A final explanation comes from the For-

[23] Although PREVIOUS FIRM CRISIS and PREVIOUS INDUSTRY CRISIS are correlated, we tried models where we included only one or the other and did not find any significant changes in the coefficients or their power.

tune scores suffering from a "financial halo", where the scores are reporting prior financial performance instead of reputation (Brown and Perry 1994).[24]

We find that for all event windows starting with the five-day, PUBLICITY has a significant negative relationship with CAR. For the five-day, ten-day, fifteen-day, and twenty-day windows we observe losses of 4.33%, 5.25%, 4.40%, and 6.09%, respectively. These are all significant at the 1% level. Consistent with our expectations and prior literature, we find that as a firm's post crisis media coverage increases, which is capturing an increase in attention and scrutiny of the firm, it drives share price lower. We also find that VOLUME, consistent with our expectations, has a negative relationship with CAR. We observe losses of 3.60% ($p < 0.01$), 4.45% ($p < 0.01$), 4.14% ($p < 0.01$), 3.73% ($p < 0.05$), and 4.15% ($p < 0.05$) in the two-day through twenty-day event windows. This finding supports our view that a crisis would induce higher levels of trading and that these higher levels of trading would translate into larger losses in share price. That both PUBLICITY and VOLUME are negative and highly significant across almost all event windows appears to show that information related to the crisis is reaching the market, though we cannot comment on the nature of the information, such as if its factual or opinion, if the information is being generated within or external to the firm, or if the information is of a positive or negative nature.[25]

We conclude this section by looking at our firm level controls. We find that SIZE has no explanatory power in our model but LEVERAGE is positively related to CAR in the ten-day (3.32%; $p < 0.10$) and fifteen-day (4.02%; $p < 0.10$) windows. This latter finding appears to con-

[24] Brown and Perry (1994) find that by regressing ROA, M/B, log sales, sales growth rate, and D/E on the reputation score we can isolate the true reputation score that is unrelated to financial performance. We were unable to perform this technique in our study since many of our observations relied on using industry average scores.

[25] There is concern that these two variables may be biasing our regression results. We tried excluding each variable individually and find that excluding PUBLICITY did not significantly change the value of the coefficients or their power. However, excluding VOLUME caused small increases in the value of the coefficients and caused the power of many variables to increase from 10% to 5% and 5% to 1%. As such, we elect to continue using the conservative results in Table 7.

firm our expectation that shareholders losses related to a crisis would be lessened as debt holders observed some of the loss in value. The positive relation between CAR and LEVERAGE means that, as more debt is on the balance sheet, the bigger the shield for shareholders. Finally, MARKET-TO-BOOK is negative and significant in the five-day through twenty-day windows. We observe a loss in share price of 0.07% ($p < 0.10$), 0.11% ($p < 0.05$), 0.21% ($p < 0.01$), and 0.26% ($p < 0.01$) in the five-day, ten-day, fifteen-day, and twenty-day windows, respectively. This finding confirms our expectation that firms with higher M/B ratios, which are capturing growth expectations priced in by the market, have more to lose. Investor sentiment quickly turns negative for the firm and the market quickly pushes the firm's share value back towards its intrinsic value.[26]

In this section we have analyzed how an apology affects share price after controlling for variables specific to crises, as identified in the SCCT and other public relations' literature, as well as controlling for firm specific attributes. The results are similar to the univariate implications. In other words, as the firm's responsibility for a crisis increases (decreases) an apology can help to minimize (exacerbate) the loss in shareholder value.

Given our findings, along with those of previous studies, what do we know about apologies? Victims want an apology. Apology is the most expected response strategy regardless of crisis type (Broacto et al. 2012). Apologies can help victims to avoid acting on their feelings of aggression and leave more favorable impressions of the harm-doer (Ohbuchi et al. 1989; Turk et al. 2012). But apologies aren't free. Offering an apology leads to higher costs and additional risks (Patel and Reinsch 2003; Coombs 2007c). In fact, the effectiveness of a corporate apology depends on the costs associated with making such a statement (Ho 2012). CEO's may determine

[26] LEVERAGE and MARKET-TO-BOOK together could be causing some issues within our model. We tried excluding each variable individually and find that it does not cause any significant changes in the value of the coefficients or their power.

that the costs of apology born by the firm are worth it so that the image of the CEO is seen more favorably (Brocato et al. 2012). Yet others show that no reputational benefit is gained by apologizing over using alternative response strategies (Coombs and Holladay 2008; De Blasio and Veale 2009; Verhoeven et al. 2012).

We believe that upon news of a crisis the market assesses how responsible the firm is and adjusts its expectations accordingly, resulting in a lower share price. An apology is then either non-informative (preventable crisis) or informative (non-preventable crisis) and the market again makes adjustments in share price. Further, our results suggest that the benefit from apologizing is more related to the responsibility of the firm, or the crisis type, than to the severity of the crisis. While a more severe crisis leads to a lower share price, an apology does not significantly change the market's view of the firm. Through what mechanism are crises and apologies effecting share price?

According to the established financial theory, a firm's share price is the present value of all future cash flows. Crises put into question these cash flows through operational shortfalls or increased costs. A firm that has a crisis is exposed to possible litigation costs, which are an uncommon expense that will reduce cash flow. A firm in a crisis may also have destroyed property, plant, and equipment that reduces production levels, which will translate into reduced revenue and increased costs as the firm attempts to salvage and rebuild physical assets. Crises for firm's that deal with consumers directly can also have diminished revenues as consumers opt to purchase from completion or find adequate substitutes for the product offered by the firm.

However, diminished future cash flows are not the only reason that a firm's share price can experience losses. Future cash flows are discounted by the firm's cost of capital, which is a reflection of the firm's riskiness. Until a crisis actually occurs, the market will assign some probability as to the likeliness of the firm experiencing a crisis. This probability will be a reflection of

systematic and idiosyncratic operational risks specific to the firm and the levels of control the firm can exert to prevent crises. The realization of crises, when probability is equal to 100%, will cause the market to reevaluate the risk profile of the firm, the industry, and possibly even the market as a whole. This reevaluation will change the discount rate, indubitably making it higher, which will in turn decrease the present value of cash flows.

We have established that apologies can either confirm or reveal contradictory information for stakeholders. An apology opens the firm to increased levels of litigation risk and carries with it the increased probability of paying damages to those affected by the crisis. These damages, along with all associated costs of legal council, are a drain on cash flow that will reduce the present value. Apologies also reveal firm responsibility. In preventable crises the firm was already seen as responsible, so decreases in cash flow and increases in risk were already factored into the share price. However, in non-preventable crises the firm was assumed to have a lower level of responsibility and thus the apology reveals new information that causes the market to possibly handicap future cash flows further, or, more likely, to increase the assessed riskiness of the firm.

Taken together, the results suggest that management can safely apologize in a preventable crisis without fear of tanking share prices, and consequently, threatening shareholder wealth. This finding supports hypothesis 2. However, management needs to be cautious when offering an apology in a non-preventable crisis as it can lead to additional declines in share price. This finding supports hypothesis 1. This is not to say management should never apologize in a non-preventable crisis, but management needs to be aware of the financial cost associated with taking this course of action. Victims should still be the primary focus in a crisis, and the ethical action should never be trumped by financial losses to shareholders.

5. Robustness

5.1 Overview

We perform a series of five sensitivity tests to confirm that our main results are robust. We perform three robustness checks specific to our original model to control for issues related to: 1) Calculation of the cumulative abnormal return; 2) endogeneity issue with the timing of apologies; and 3) the dynamic nature of the apology variable. We then perform two more robustness checks separate to our original model: 4) verifying our results using a nonparametric test, and 5) changing our event windows to start on the day of the apology. At the end of this section we summarize the main robustness check results. Although we present all variables in the tables accompanying our following robustness checks, we limit our discussion to only those variables of direct importance to our hypotheses.

5.2 Fama French Three Factor Model

We have used a single index model to estimate returns under normal market conditions. To examine issues related to model misspecification, we also proxy normal condition returns using the Fama-French three factor model, as presented in equation (9).[27] Data for the risk-free rate and three factors is obtained from the Fama-French & Liquidity Factors database. The resulting CARs are used in equation (6) and the results are reported in Table 9.

$$\widehat{\mathrm{AR}}_{i_t} = \mathrm{R}_{\mathrm{i_t}} - \left(\hat{\alpha}_i + \hat{\beta}_{i_{EXMKT}}\mathrm{EXMKT} + \hat{\beta}_{i_{HML}}\mathrm{HML} + \hat{\beta}_{i_{SMB}}\mathrm{SMB}\right) \quad (9)$$

Where: EXMKT = Excess market return over the risk free rate (measured as CRSP Value-weighed market index minus the risk free rate)

HML = High minus low (measured as book-to-market ratio)

SMB = Small minus big (measured as market capitalization)

[Insert Table 9 here.]

[27] We also tried the Carhart model and found similar results. The Carhart model takes the Fama-French model and adds a fourth factor, momentum.

Comparing Table 9 to Table 7, we find that the signs on the coefficients do not differ from those found in Table 7, but the magnitude and statistical power are changed. First, we find that the impact of PREVENTABLE CRISIS is nonexistent when we use the three factor model to estimate abnormal returns. FATALITIES is only significant in the first two windows with losses of 2.11% ($p < 0.05$) in the two-day and 2.49% ($p < 0.05$) in the five-day event windows. Surprisingly, APOLOGY is only significant in the two-day window with a loss of 9.80% ($p < 0.10$). We find that APOLOGY * PREVENTABLE CRISIS is positive and significant in the two-day (9.55%), five-day (8.98%), and ten-day (8.07%) event windows. All three coefficients are significant at the 5% level. Lastly, there is no observed explanatory power in the interaction APOLOGY * FATALITIES. These results are marginally consistent with our main findings: Apologizing has a positive effect in cases where a firm is responsible for the crisis but is not related to the severity of the crisis.

5.3 Instrumental Variable in 2SLS

SCCT maintains that the causal relationship between a crisis occurring and the firm choosing an appropriate response is unidirectional: A crisis happens and *then* management decides what course of action to take in *response* to the crisis. We are concerned that management's response strategy may be influenced by the market's response to the crisis. If a firm has suffered large losses it may take the view that things can't get much worse if they do apologize, perhaps even believing that an apology will rebound the stock. If this is the case then the inferences drawn from our main results may be misleading. In an attempt to address the possible endogeneity of APOLOGY we estimate a two-stage least squares (2SLS) regression using the ratio of advertising expense to sales as our instrumental variable, similar to Servas and Tamayo (2013) and which we likewise refer to as ADVERTISING INTENSITY. Advertising reduces the information gap between a firm and stakeholders (Servas and Tamayo 2013). If a channel of commu-

nication is already present before a crisis, as measured through advertising expense, management should be able to better disseminate and articulate the causes of a crisis and get their apology heard within the appropriate context. The average correlations between CAR and advertising intensity and between apology and advertising intensity are not particularly strong but it is the best performing of all the instrumental variables considered.[28] Using ADVERTISING INTENSITY we perform a Durbin-Hu-Hausman test for endogeneity and find evidence that endogeneity may exist. We proceed to use a 2SLS model where we predict the likelihood of an apology in the first stage using, since APOLOGY is a dummy variable, a logit regression, and then use the predicted likelihood of apology, termed Pr(APOLOGY)_fit, in the second stage. All other variables are measured as in equation (6). The 2SLS equations are formalized below:

$$\Pr(Apology) = \alpha_i + \beta_{1i} ADVERTISING\ INTENSITY + \beta_{2i} PREVENTABLE + \beta_{3i} FATALITIES + \sum_{k=4}^{K} \beta_{ki}\, CRISIS\ CONTROLS_i + \sum_{j=9}^{J} \beta_{Ji}\, FIRM\ CONTROLS_i + \varepsilon_i \quad (10)$$

[28] We tried to rely on theory in first identifying variables we could use as an instrument. This immediately restricted use of PREVENTABLE CRISIS and FATALITIES since these are factors that determine how a firm's stock performs post-crisis. We considered using REPUTATION, PUBLICITY, PREVIOUS FIRM CRISIS, and PREVIOUS INDUSTRY CRISIS but requirements for a valid instrument were not met for these four variables. We also considered using KLD's Corporate Social Responsibility data, but could not obtain observations for nearly half of our sample. Other instruments tried or considered include: sex of the CEO, rank of CARs, rank of raw (unadjusted) returns, ratio of R&D to sales, lagged ROA, and lagged ROE including the 3-factor and 5-factor Dupont decomposition.

$$\widehat{CAR_i}(\tau, \tau_{+1}) = \alpha_i + \beta_{1i} PREVENTABLE + \beta_{2i} FATALITIES + \beta_{3i} \Pr(APOLOGY)\_fit$$
$$+ \beta_{4i}(\Pr(APOLOGY)\_fit * PREVENTABLE)$$
$$+ \beta_{5i}(\Pr(APOLOGY)\_fit * FATALATIES) + \sum_{k=6}^{K} \beta_{ki}\, CRISIS\ CONTROLS_i \quad (11)$$
$$+ \sum_{j=11}^{J} \beta_{Ji}\, FIRM\ CONTROLS_i + \varepsilon_i$$

Where: CRISIS CONTROLS includes victim crisis dummy, preventable crisis dummy, number of fatalities, victim crisis and fatalities interaction, preventable crisis and fatalities interaction, crisis history dummies (firm & industry), mean reputation score, and log publicity. FIRM CONTROLS includes volume, size, leverage, and market-to-book ratio.

The results of the first stage are presented in Table 10 and the results of the second stage are presented in Table 11. In the first stage we find that our instrumental variable. ADVERTISING INTENTSITY, is positively related with the decision to apologize. We find that the change in stock price, CAR, is negatively related, meaning that as the price goes lower a firm is more likely to apologize, but is only significant in the two-day window. We find that PREVENTABLE CRISIS is positively related to apology and FATALITIES is negatively related. These findings are not surprising, and fall in line with our expectations given SCCT.

[Insert Table 10 here.]

In Table 11 we observe the results of the second stage. Here we find that the coefficient on PREVENTABLE CRISIS is significant across five of the event windows. When a firm is responsible for the crisis they suffer losses of 2.01% ($p < 0.10$) in the 2 day, 3.29% ($p < 0.05$) in the 5 day, 5.62% ($p < 0.05$) in the 10 day, and 7.95% ($p < 0.05$) in the 20 day event windows. FATALITIES is significant in only three of the event windows, with losses of 1.59% ($p < 0.10$), 2.41% ($p < 0.05$), and 4.01% ($p < 0.10$) in the 2 day, 5 day, and 15 day event windows, respectively. Given the nature of the Pr(APOLOGY)_fit variable, specific interpretation of the coeffi-

cients is difficult. However, we can observe that Pr(APOLOGY)_fit is negatively related with CAR and significant in three of the event windows, meaning that as the likelihood of apologizing increases, shareholders value decreases. Likewise, the moderating effect of an apology on a preventable crisis (Pr(APOLOGY)_fit * PREVENTABLE CRISIS) is positive and significant in all five event windows. And finally, the moderating effect of an apology on fatalities is negative but only significant in the 2 day window.

[Insert Table 11 here.]

The results of our 2SLS and OLS investigations lead to similar conclusions. For type of crisis the effectiveness of an apology as interpreted through CAR is positively and significantly related to crisis responsibility. Similar to our main results we also find some evidence of a negative relationship between offering an apology given fatalities and CAR. These results should be cautiously interpreted as 2SLS relies on the identification of a strong instrument in a well-defined model.

5.4 Static Apology Variable

A final area that merits additional exploration is the measurement of APOLOGY. In equation (6) we allow the size of the apology window to move in unison with the CAR event window. For example, when looking at the CAR for the five-day window, we set the APOLOGY dummy equal to one for any firm that apologized between day zero and day five. This may lead to instances where two firms are flagged as having apologized in the first five days of the crisis but one firm actually apologized on day one and the other firm apologized on day four. The CAR for the first firm would be a result of a firm apologizing and the market having four days to digest this information and react whereas the second firms CAR would be reflective of the apology happening later and the market only having one day to react. To account for this issue we rerun

equation (6) but fix the measurement of APOLOGY to a specific time period for all event window regressions.

The results of equation (6) with a fixed apology repressor can be found in Table 12. The table is divided into three panels. Panel A fixes the apology dummy over the two-day window and reports regression results for all five-event windows. Panel B fixes the apology dummy over the five-day window and reports regression results for the five-day through twenty-day event windows. Panel C fixes the apology dummy over the ten-day window and reports regression results for the ten-day through twenty-day event windows. Since the number of apologetic firms is unchanged between the fifteen-day and twenty-day windows we do not need to make any adjustments to APOLOGY.

[Insert Table 12 here.]

Starting with the results of using a two-day apology window (Panel A) we find many similarities, but a few differences warrant further discussion. For PREVENTABLE CRISIS, the reported coefficients are all smaller than those in Table 7. We also find that the statistical power is maintained with the exception of the fifteen-day window where the p-value falls above the 10% level. We also find that FATALITIES reported coefficients are smaller and that the statistical power is consistent with the exception of the twenty-day window. The APOLOGY results show the most change relative to Table 7. The coefficients in the five-day and ten-day windows are much larger, but then drastically reduce to be smaller in the fifteen-day and twenty-day windows (in absolute terms). Also, the only statistically significant coefficient is in the five-day window. However, despite this major difference in the APOLOGY coefficients we find that APOLOGY * PREVENTABLE CRISIS and APOLOGY * FATALITIES are similar to the results reported in Table 7 with the only difference being the loss in statistical power in the fifteen-day window for APOLOGY * PREVENTABLE CRISIS.

The results of using a five-day apology window (Panel B) are similar to those of a two-day apology window. The findings for PREVENTABLE CRISIS and FATALITIES are similar to the results reported in Table 7. Again, APOLOGY is only significant in the first window (five-day event window). APOLOGY * PREVENTABLE CRISIS and APOLOGY * FATALITIES results are similar to those in Table 7. And lastly, the results of using a ten-day apology window (Panel C) are very similar to the results in Table 7 for all independent variables of interest.

The results of this section reveal that the statistical power of APOLOGY is diminished when we keep the measurement of APOLOGY static over all the event windows. However, the impact of APOLOGY * PREVENTABLE CRISIS and APOLOGY * FATALITIES were not significantly affected. This leads us to conclude that, consistent with our main findings, the effectiveness of an apology is related to how responsible a firm is for the crisis and is not related to the severity of the crisis.

5.5 Nonparametric Tests

Brown and Warner (1985) note that event studies using daily data are often not normal in their distributions, often showing fat tails with a right skew. This can lead to false rejection rates when using parametric tests. This violation of the assumption of normality can make nonparametric tests more powerful since these tests make no assumptions about the distribution of variables. Nonparametric tests are typically used in event studies, and indeed a number of previous articles referenced in this study use nonparametric tests to strengthen their results (Walker et. al 2005; Walker et al 2006; Chen et. al 2009; Mio and Fasan 2012). We elect to use the Wilcoxon-Mann-Whitney test. This test is a rank-sum test, which tests the null hypothesis that two populations are the same. We use the test to see if the nonparametric test can detect significant differences in median between the non-apology and apology portfolios. Table 13 reports the results for the four tests we ran. Panel A tests apology versus non-apology for the full sample. Panel B tests

apology versus non-apology for firms that have a non-preventable crisis. Panel C tests apology versus non-apology for firms that have a preventable crisis. Panel D tests apology versus non-apology for firms that have fatalities. Table 13 reports the Z-score with the p-value reported underneath. When the reported Z-score is negative (positive) it can be interpreted as the non-apology (apology) portfolio has higher returns compared to the apology (non-apology) portfolio.

The test statistics indicate that for the full sample the non-apology portfolio performs better than the apology portfolio in the two-day ($Z = -1.794$; $p < 0.10$), five-day ($Z = -2.345$; $p < 0.05$), and ten-day ($Z = -1.676$; $p < 0.10$) event windows. For non-preventable crises we find that the non-apology portfolio performs better than the apology portfolio in the two-day ($Z = -2.162$; $p < 0.10$), five-day ($Z = -3.204$; $p < 0.01$), ten-day ($Z = -3.205$; $p < 0.01$), fifteen-day ($Z = -2.452$; $p < 0.05$), and twenty-day ($Z = -2.059$; $p < 0.10$) event windows. For preventable crises we find that the apology portfolio performs better than the non-apology portfolio in the ten-day ($Z = 2.357$; $p < 0.05$) and fifteen-day ($Z = 1.777$; $p < 0.10$) event windows. Finally, for firms that have fatalities due to a crisis we find that the apology portfolio performs better than the non-apology portfolio in the two-day ($Z = 2.177$; $p < 0.05$) event window, meaning, if there is a fatality, an immediate apology will deflect some of the share price damage.

The results of our nonparametric test show that our initial findings are robust to assumptions of sample distribution and outliers. The returns for firms with a non-preventable crisis that apologize are negatively affected and a preventable crisis was positively affected by an apology in ten-day and fifteen-day windows. Again, our results show that the positive or negative effect of an apology is related to crisis responsibility.

5.6 Apology as Event Date Zero

For our final robustness check we change our event windows so that the first day is the apology. We do this so that we can more accurately discern the impact of an apology without any

cofounding information in the period between the crisis and the apology. We use the same procedure outlined in equation (1) through equation (4) to calculate and test the CAR. Figure 5 is provided as a visual aid to assist with understanding the process.

[Insert Figure 5 here.]

We still use the crisis date as our anchor (τ) and the estimation window is the two hundred and fifty trading days between -270 (τ_{-2}) and -20 (τ_{-1}) event days prior to the crisis. This means we use the same intercept and beta that we previously calculated using the market model. We retain the same estimation window to avoid instances where the crisis and subsequent trading days would be captured in the estimation window (i.e. when the apology was offered after the first twenty days of the crisis). It is important to avoid cross contamination of events so as to avoid potentially biasing our market model parameters downwards and creating CARs further away from their true value. The event windows are made up of the trading days between the apology (τ^*) and the last day of the window (τ^*_{+1}). We use the same five event windows as in the main section. Once we calculate individual firm CAR, we create two distinct portfolios determined by a firm's level of responsibility for a crisis: $\overline{CAR}_{AA}(\tau^*, \tau^*_{+1})$ representing the portfolio of all firms that apologize in response to a non-preventable crisis and $\overline{\overline{CAR}}_{PA}(\tau^*, \tau^*_{+1})$ representing the portfolio of all firms that apologize in response to a preventable crisis.

The results of our event study can be found in Table 14. Figure 6 presents the event study results in a time series for the two portfolios. We find that for non-preventable crises an apology leads to an initial shock in the first two days (-2.947%) which continues to decline through the five-day (-4.538%) and ten-day (-4.774%) windows before showing a reversal of trend in the fifteen-day (-4.422%) and twenty-day (-3.937%) windows. All of these coefficients are significant at the 1% level. We find that for preventable crises an apology also leads to an initial shock in the first two days (-2.049%; $p < 0.05$) but that the CAR gradually restores this lost value before

realizing a positive return in the twenty-day window (1.695%; $p < 0.05$). We find that a statistically significant ($p < 0.01$) difference in means exists between non-preventable and preventable crisis firms that apologizes with differences of -0.898%, -3.234%, -4.467%, -3.631%, -5.633% in the two-day, five-day, ten-day, fifteen-day, and twenty-day windows, respectively. This finding indicates that offering an apology for a non-preventable crisis will lead to a lower share price than offering an apology for a preventable crisis.

[Insert Table 14 here.]

[Insert Figure 6 here.]

These results confirm our main results in that an apology benefits firms in a preventable crisis more than firms in a non-preventable crisis. Thus, we can continue to conclude that the effectiveness of an apology is related to the level of firm responsibility for the crisis.

5.7 Summary of Tests

[Insert Table 15 here.]

Table 15 presents the findings of our five robustness tests in comparison to the findings in our main section. We find that overall the efficacy of an apology offered in response to a crisis is related to the level of responsibility for the crisis attributable to the firm. In our main tests we found support for hypothesis 1. Robustness tests using the Fama French three factor model to estimate CAR and keeping the apology window static leads us to reject hypothesis 1. However, robustness tests using a 2SLS, nonparametric method, and changing the event window to start at the apology also found support for hypothesis 1. Thus we conclude, with some caveats, that apologizing has a negative effect on stock returns for victim and accidental crises post-crisis. Our main results support hypothesis 2 and all five robustness checks confirm our main findings. That is, the negative stock return effect from apologizing is mitigated as the firm's responsibility

for the crisis increases. Finally we did not find support for hypothesis 3. That is, the negative stock return effect related to the severity of the crisis is not affected by apologizing.

6. Conclusion

Crises are rare events in a firm's life. When a crisis strikes management must respond quickly to avoid further harm and damage to victims of the crisis. However, management also has a fiduciary duty to protect shareholders wealth. Often, the response demanded from victims and shareholders are at odds with each other. The impact of the dichotomy between victim and shareholder has seen only minimal study in modern crisis research. This study examines an apologies impact on share price using Situational Crisis Communication Theory to identify crisis type and response strategy for 235 unique crises. Using cross sectional regression analysis we isolate the impact of apology from other complexities of crises such as firm responsibility, severity, crisis history, firm reputation, publicity, and trading volume. Our findings yield valuable information for management to be aware of in deciding how to respond in a crisis.

Like all research, the findings in this paper come with limitations. Prior research has relied on experimental methods to isolate how victims or consumers respond to management's words of apology. One issue with our current research is the uniqueness of every crisis with all its associated complexities and nuances, which can make broad sweeping empirical analysis difficult (Pace et al. 2009). Unlike Marcus and Goodman (1991) we assume that a firm adopts a single response strategy that it does not change or adapt. Firms may also choose to use a strategy that simultaneously combines two strategies (Sellnow and Seeger 2013). Another assumption is the binary nature of apology. Lee and Chung (2012) caution that false generalizations are made because of this binary measurement. Instead they argue that the content of apologies should be analyzed for high and low levels of admission of guilt, acceptance of responsibility, and offers of sympathy. A final limitation in our current study is the identification and coding of crisis type,

response strategy, and other qualitative crisis date like crisis history and severity. One way to control for many of these limitations and extend our current study is to employ a mixed methods approach where participants code crisis type and response strategy for various dimensions on a scale. These responses could then be used within the empirical models used in this paper.

Even with these noted limitations our results reveal an important story for management to be aware of. Our paper is unique in that we used empirical methods to identify how the stock market reacts to the simple words "I am sorry". As far as we are aware, our paper is the first to specifically study corporate apologies using a large dataset of real firms in crisis. Prior crisis management literature has been almost exclusively experimental in nature and focused on how victims, consumers, and the general public interpret and react to apologetic discourse, and papers studying crises in general typically only have a small sample of firms. We are also one of the few papers to operationalize SCCT for empirical use. Given our dataset, methodology, and grounding theory we fill a void in the crisis management literature by looking at how apologies affect shareholders. The findings of this study help to create a more complete picture of crisis management by presenting stock market reactions to crises and apologies; a link critical to practitioners who are confronted with crises and must make important decisions.

In our study we find that, in general, the market penalizes firms that apologize in response to a crisis. However, through cross sectional regression analysis, we find that we can attribute this finding to differences in crisis type. We find that the negative effect of an apology is reduced as firm responsibility increases. When a firm is clearly responsible for a crisis an apology no longer hurts the firms share price, but when a firm is not clearly responsible and offers an apology the market discounts the share price beyond that accredited to the crisis type. This heighted loss for non-preventable crises can be attributed to the market either lowering expectations of future cash flows or increasing the cost of capital, which is a proxy for riskiness of the

firm. More likely, a combination of both decreased future cash flows and increased cost of capital are driving share prices, which is the present value of discounted future cash flows, lower. Our findings are good news for apologetic managers confronted with a preventable crisis and a word of caution for apologetic managers confronted with a non-preventable crisis. The latter does not mean that management should not apologize when they are in an accidental or victim crisis, but they should be keenly aware of the cost associated with this action. Finally, we do not find any relationship between severity of the crisis, as measured by fatalities, and the effectiveness of an apology. Our results lead us to conclude that the efficacy of an apology is associated with the level of responsibility for the crisis that is attributable to the firm and is unrelated to the severity. Further, our results stand up to a series of robustness checks.

7. Bibliography

An, S.-K., and Cheng, I.-H. (2009). Crisis Communication Research in Public Relations Journals: Tracking Research Trends Over Thirty Years. In W. T. Coombs, and S. J. Holladay, *The Handook of Crisis Communication* (*p*p. 65-90). Blackwell Publishing Ltd.

Bamber, L., Barron, O., and Stevens, D. (2011). Trading Volume Around Earnings Announcements and Other Financial Reports: Theory, Research Design, Empirical Evidence, and Directions for Future Research. *Contemporary Accounting Research, 28*(2), 431-471.

Bonini, S and Boraschi D. (2010). Corporate Scandals and Capital Structure. *Journal of Business Ethics, 95*, 241-269.

Borenstein, S., and Zimmerman, M. (1988). Market Incentives for Safe Commercial Airline Operation. *The American Economic Review, 78*(5), 913-935.

Brocato, E. D., Peterson, R. A., and Crittenden, V. L. (2012). When Things Go Wrong: Account Strategy Following a Corporate Crisis Event. *Corporate Reputation Review, 15*(1), 35-51.

Broder, I.E. and Morrall, J.F. (1991). Incentives for Firms to Provide Safety: Regulatory Authority and Capital Market Reactions. *Journal of Regulatory Economics, 3*(4), 309-322.

Brown, B. and Perry, S. (1994). Removing the Financial Performance Halo From Fortune's "Most Admired" Companies. *Academy of Management Journal, 37*(5), 1347-1359.

Brown, S. J., and Warner, J. B. (1980). Measuring Security Price Performance. *Journal of Financial Economics, 8*(3), 205-258.

Brown, S. J., and Warner, J. B. (1985). Using Daily Stock Returns: The Case of Event Studies. *Journal of Financial Economics, 14*(1), 3-31.

Campbell, J. Y., Lo, A. W., and MacKinlay, A. C. (1997). *The Econometrics of Financial Markets*. Pinceton, NJ: Princeton University Press.

Capelle-Blancard, G., and Laguna, M.-A. (2010). How Does the Stock Market Respond to Chemical Disasters? *Journal of Environmental Economics and Management, 59*, 192-205.

Carpentier, C., and Suret, J.-M. (2013). Stock Market and Deterrence Effect: A Long-Run Analysis of Major Environmental and Non-Environmental Disasters. *Working Paper*.

Chae, J. (2005). Trading Volume, Information Asymmetry, and Timing Information. *The Journal of Finance, 60*(1), 413-442.

Chance, D., Cicon, J., and Ferris, S. (2013). When Things Go Wrong: Corporate Decisions of Whom to Blame. *Working Paper*.

Chen, Y., Ganesan, S., and Liu, Y. (2009). Does a Firm's Product-Recall Strategy Affect Its Financial Value? An Examination of Strategic Alternatives During Product-Harm Crises. *Journal of Marketing, 73*(6), 214-226.

Claeys, A.-S., Cauberghe, V., and Vynchke, P. (2010). Restoring reputations in times of crisis: An experimental study of the Situational Crisis Communication Theory and the moderating effects of locus of control. *Public Relations Review*, 256-262.

Coombs, W. T. (1995). Choosing the Right Words: The Development of Guidelines for the Selection of the "Appropriate" Crisis-Response Strategies. *Management Communication Quarterly, 8*(4), 447-476.

Coombs, W. T. (1998). An analytic framework for crisis situations: Better responses from a better understanding of the situation. *Journal of public relations research, 10*(3), 177-191.

Coombs, W. T. (2006). Crisis Management: A Communicative Approach. In C. H. Botan, and V. Hazleton, *Public relations theory II* (*p*p. 171-197). Mahwah, NJ: Lawrence Erlbaum Associates.

Coombs, W. T. (2007a). Attribuion theory as a guide for post-crisis communication research. *Public Relations Review*, 135-139.

Coombs, W. T. (2007b). *Ongoing crisis communication: planning, managing, and responding*. Los Angeles: SAGE Publications.

Coombs, W. T. (2007c). Protecting organiztion reputations during a crisis: The development and application of Situational Crisis Communication Theory. *Corporate Reputation Review, 10*(3), 163-176.

Coombs, W. T. (2008). Conceptualizing Crisis Communication. In R. L. Heath and H. D. O'Hair, *Handbook of Risk and Crisis Communication* (pp. 99-118). Routledge.

Coombs, W. T., and Holladay, S. J. (1996). Communication and Attributions in a Crisis: An Experimental Study in Crisis Communication. *Journal of Public Relations Research, 8*(4), 279-295.

Coombs, W. T., and Holladay, S. J. (2002). Helping Crisis Managers Protect Reputation Assets. *Management Communication Quarterly, 16*(2), 165-186.

Coombs, W. T., and Holladay, S. J. (2004). Reasoned Action in Crisis Communication: An Attribution Theory-based Approach to Crisis Management. In D.P. Millar and R.L. Heath, *Responding to Crisis: A Rhetorical Approach to Crisis Communication* (pp. 95-115). Lawrence Erlbarum Associates.

Coombs, W. T., and Holladay, S. J. (2005). Exploratory Study of Stakeholder Emotions: Affect and Crisis'. In N.M. Ashkanasy, W.J. Zerbe, and C.E.J. Hartel, *Reseach on Emotion in*

Organizations: Volume 1: The Effect of Affect in Organizational Settings (pp. 271-288). Elsevier.

Coombs, W. T., and Holladay, S. J. (2007). The Negative Communication Dynamic: Exploring the impact of stakeholder behavioral intentions. *Journal of Communication Management, 11*(4), 300-312.

Coombs, W. T., and Holladay, S. J. (2008). Comparing apology to equivalent crisis response strategies: Clarifying apology's role and value in crisis communication. *Public Relations Review*, 252-257.

Dawson, J.F. (2014). Moderation in Management Research: What, Why, When, and How. *Journal of Business Psychology, 29*, 1-19.

De Blasio, A. and Veale, R. (2009). Why Say Sorry? Influencing Consumer Perceptions Post Organizational Crises. *Australasian Marketing Journal, 17,* 75-83.

Elliot, J. D. (2009). How Do Past Crises Affect Publics' Perceptions of Current Events? An Experiment Testing Corporate Reputation During an Adverse Event. In W. T. Coombs, and S. J. Holladay, *The Handbook of Crisis Communication* (*p*p. 205-220). Blackwell Publishing Ltd.

Fediuk, T. A., Pace, K. M., and Botero, I. C. (2009). Crisis Response Effectiveness: Methodological Considerations for Advancement in Empirical Investigation into Response Impact. In W. T. Coombs, and S. J. Holladay, *The Handbook of Crisis Communication* (*p*p. 221-242). BLackwell Publishing Ltd.

Fitzpatrick, K. R., and Rubin, M. S. (1995). Public Relations vs. Legal Strategies in Organizational Crisis Decisions. *Public Relations Review, 21*(1), 21-33.

Fombrun, C. (1996). *Reputation: Realizing Value from the Corporate Image*. Boston, MA: Harvard Business Review Press.

Fombrun, C., and Shanley, M. (1990). What's in a name? Reputation building and corporate strategy. *The Academy of Management Journal, 33*(2), 233-258.

Friedman, H. H. (2006). The power of remorse and apology. *Journal of College and Character, 7*(1), 1-14.

Ho, B. (2012). Apologies as signals: With evidence from a trust game. *Management Science, 58*(1), 141-158.

Ho, B., and Liu, E. (2011a). Does sorry work? The impact of apology laws on medical malpractice. *Journal of Risk and Uncertainty, 43*(2), 141-167.

Ho, B., and Liu, E. (2011b). What's an apology worth? Decomposing the effects of apologies on medical malpractie payments using state apology laws. *Journal of Empirical Legal Stuides, 8*, 179-199.

Jones, K. and Rubin, P. (2001). Effects of Harmful Environmental Events on Reputations of Firms. In K. John, A. Makhija, and S. Ferris, *Advances in Financial Economics, Volume 6* (pp. 161-182). Emerald Group Publishing Limited.

Kaufmann, J. B., Kesner, I. F., and Hazen, T. L. (1994). The Myth of Full Disclosure: A Look at Organizational Communications During Crises. *Business Horizons*, 29-39.

Knight, R. F., and Pretty, D. J. (1999). Corporate Catastrophes, Stock Returns, and Trading Volume. *Corporate Reputation Review, 2*(4), 363-378.

Kossovsky, N. (2012). *Reputation, Stock Price, And You: Why the Market Rewards Some Companies and Punishes Others*. New York, NY: Apress

Kothari, S. P., and Warner, J. B. (2007). Econometrics of Event Studies. In B. E. Eckbo, *Handbook of Corporate Finance Vol 1: Empirical Corporate Finanace* (pp. 1-36).

Lee, F., Peterson, C., and Tiedens, L. Z. (2004). Mea Culpa: Predicting stock prices from organizational attributions. *Personality and social psychology bulletin, 30*(12), 1636-1649.

Lee, S. and Chung, S. (2012). Corporate Apology and Crisis Communication: The Effect of Responsibility Admittance and Sympathetic Expression on Public's Anger Relief. *Public Relations Review, 38*, 932-934.

Lucero, M., Kwang, A. T., and Pang, A. (2009). Crisis Leadership: When Should the CEO Step Up? *Corporate Communication: An International Journal, 14*(3), 234-248.

Luchs, C., Stuebs, M., and Sun, L. (2009). Corporate Reputation and Earnings Quality. *The Journal of Applied Business Research, 25*(4), 47-54.

MacKinlay, A. C. (1997). Event Studies in Economics and Finance. *Journal of Economic Literature, 35*(1), 13-39.

Marcus, A. A., and Goodman, R. S. (1991). Victims and Shareholders: The Dilemmas of Presenting Corporate Policy During a Crisis. *The Academy of Management Journal, 34*(2), 281-305.

Mattila, A. S. (2009). How to Handle PR Disasters? An Examanation of the Impact of Communication Response Type and Failure Attributions on Consumer Perceptions. *Journal of Services Marketing, 23*(4), 211-218.

McDonald, L.M., Sparks, B., and Glendon, A.I. (2010). Stakeholder Reactions to Company Crisis Communication and Causes. *Public Relations Review, 36,* 263-271.

Mio, C. and Fasan, M. (2012). Does Corporate Social Performance Yield Any Tangible Financial Benefit During a Crisis? An Event Study of Lehman Brothers' Bankruptcy. *Corporate Reputation Review, 15*(4). 263-284.

Mitchell, M. L., and Maloney, M. T. (1989). Crisis in the Cockpit? The Role of Market Forces in Promoting Air Travel Safety. *Journal of Law and Economics, 32*(2), 329-355.

Mungan, M. C. (2012). Don't Say You're Sorry Unless You Mean It: Pricing Apologies to Achieve Credibility. *International Review of Law and Economics, 32*, 178-187.

O'Hara, E. A. (2004). Apology and Thick Trust: What Spouse Abusers and Negligent Doctors Might Have in Common. *Chicago-Kent Law Review, 79*(3), 1055-1089.

O'Hara, E. A., and Yarn, D. (2002). On Apology and Consilience. *Washington Law Review, 77*, 1121-1192.

Ohbuchi, K., Kameda, M., and Agarie, N. (1989). Apology as Aggression Control: Its Role in Mediating Appraisl of and Response to Harm. *Journal of Personality and Social Psychology, 56*, 219-227.

Patel, A., and Reinsch, L. (2003). Companies Can Apologize: Corporate Apologies and Legal Liability. *Business Communication Quarterly, 66*, 9-25.

Pincus, T. H. (1986). A crisis parachute: Helping stock prices have a soft landing. *Journal of Business Strategy, 6*(4), 32-38.

Robbennolt, J. K. (2003). Apologies and Legal Settlement: An Empirical Examination. *Michigan Law Review, 102*(3), 460-516.

Roberts, P. W., and Dowling, G. R. (2002). Corporate Reputation and Sustained Superior Financial Performance. *Strategic Management Journal, 23*(12), 1077-1093.

Schnietz, K. E., and Epstein, M. J. (2005). Exploring the Financial Value of a Reputation for Corporate Social Responsibility During a Crisis. *Corporate Reputation Review, 7*(4), 327-345.

Sellnow, T. L. and Seeger, M.W. (2013). *Theorizing Crisis Communication*. Chichester, West Sussex, UK: John Wiley & Sons, Inc.

Sellnow, T. L., Ulmer, R. R., and Snider, M. (1998). The Compatibility of Corrective Action in Organizational Crisis Communication. *Communication Quarterly, 46*(1), 60-74.

Servaes, H. and Tamayo, A. (2013). The Impact of Corporate Social Responsibility on Firm Value: The Role of Customer Awareness. *Management Science, 59*(5), 1045-1061.

Smith, N. (2008). *I Was Wrong: The Meanings of Apologies*. Cambridge University Press.

Taft, L. (2000). Apology subverted: The commodification of apology. *The Yale Law Journal, 109*, 1135-1160.

ten Brinke, L., and Adams, G. (2013). Saving Face?: Emotional Facial Expressions During Corporate Public Apologies Influence Stock Market Prices. *Working Paper*.

Turk, J. V., Jin, Y., Stewart, S., Kim, J., and Hipple, J. R. (2012). Examining the Interplay of an Organization's Prior Reputation, CEO's Visibility, and Immediate Response to a Crisis. *Public Relations Review, 38*, 574-583.

Tyler, L. (1997). Liability means never being able to say you're sorry: Corporate guilt, legal constraints, and defensiveness in corporate communication. *Management Communication Quarterly, 11*(1), 51-73.

Verhoeven, J. W., Van Hoof, J. J., Keurs, H. T., and Van Vuuren, M. (2012). Effects of Apologies and Crisis Responsibility on Corporate and Spokesperson Reputation. *Public Relations Review, 38*, 501-504.

Walker, T. J., Pukthuanthong, K., and Barabanov, S. S. (2006). On the Stock Market's Reaction to Major Railroad Accidents. *Journal of the Transportation Research Forum, 45*(1), 23-39.

Walker, T. J., Thiengtham, D. J., and Lin, M. Y. (2005). On the Performance of Airlines and Airplane Manufacturers Following Aviation Disasters. *Canadian Journal of Administrative Sciences, 22*(1), 21-34.

Watson, T. (2007). Reputation and Ethical Behaviour in a Crisis: Predicting Survival. *Journal of Communication Management, 11*(4), 371-384.

Wohl, M. J., Hornsey, M. J., and Philpot, C. R. (2011). A critical review of official public apologies: Aims, Pitfalls, and a staircase model of effectiveness. *Social issues and policy review, 5*(1), 70-100.

Yu, B. C., Ho Meng-Keng, B., Tong, L. L., and Fadjiar, N. (2012). When Should Organizations Apologize in Times of Crises? Working Paper.

TABLE 1
Stock market reaction to crises

Study	Sample	Sample Period	Main Results
Borenstein and Zimmerman (1988)	74 Airline Crises	1960-1985	CAR[0,+10] = -0.23%
Broder and Morral (1991)	86 Fatal Crises	1963-1986	CAR{0,+10] = -2.57%
Capelle-Blancard and Laguna (2010)	64 Chemical Crises	1990-2005	CAR[0,+5] = -1.00%; CAR[0,+20] = -1.11%
Carpentier and Suret (2013)	170 Industrial Crises	1959-2010	CAR[0,+10] = -2.05%; CAR[0,+20] = -2.54%
Chen et al. (2009)	153 Product Recalls	1996-2007	AR[0] = -0.59%
Jones and Rubin (2001)	73 Environmental Crises	1970-1992	CAR[0,+2] = -0.15%; CAR[0,+10] = +0.44%
Knight and Pretty (1999)	15 Corporate Crises	1982-1993	CAR[0,+10] = -6.65%; CAR[0,+20] = -5.16%
Mio and Fasan (2012)	S&P 500 Non-financial Firms	2008	AR[0] = -1.46%
Mitchell and Maloney (1989)	24 Airline Crises	1964-1987	CAR[0,+2] = -2.27%; CAR[0,+5] = -2.51%
Walker et al. (2005)	107 Airline Crises	1962-2003	CAR[0,+14] = -3.18%; CAR[0,+1yr] = +5.74%
Walker et al. (2006)	26 Railroad Crises	1993-2003	CAR[0,+10] = -0.27%

TABLE 2

Crisis type with corresponding crisis response strategy

CRISIS TYPES	CRISIS RESPONSE STRATEGIES
Victim Cluster	***Denial Posture***
Natural Disasters *(Acts of nature damage an organization)*	Attacking the Accuser *(Crisis manager confronts the person or group claiming something is wrong with the organization)*
Rumors *(False and damaging information about an organization is being circulated)*	Denial *(Crisis manager asserts that there is no crisis)*
Workplace Violence *(Current or former employee attacks current employees onsite)*	Scapegoating *(Crisis manager blames some person or group outside the organization for the crisis)*
Malevolence/Product Tampering *(External agent causes damage to an organization)*	
Accidental Crisis Cluster	***Diminishment Posture***
Challenges *(Stakeholders claim an organization is operating in an inappropriate manner)*	Excusing *(Crisis manager minimizes organizational responsibility by denying intent to do harm and/or claiming inability to control the events that triggered the crisis)*
Technical-error Accidents *(A technology or equipment failure causes an accident)*	Justification *(Crisis manager minimizes perceived damage causes by the crisis)*
Technical-error Product Harm *(A technology or equipment failure causes a product to be harmful to users)*	
Preventable Crisis Cluster	***Rebuilding Posture***
Human-error Accidents *(Human error causes an accident)*	Compensation *(Crisis manager offers money or other gifts to victims)*
Human-error Product Harm *(Human error causes a product to be harmful to users)*	Apology *(Crisis manager indicates the organization takes full responsibility for the crisis and asks stakeholders for forgiveness)*
Organizational Misdeeds *(Stakeholders are deceived and/or laws or regulations are violated by management)*	

Source: Coombs (2007c)

TABLE 3
Sample characteristics

PANEL A: Crisis type

	Total Sample	Apology	Non-Apology
Victim Crisis	14	3	11
Accidental Crisis	168	19	149
Preventable Crisis	53	15	38
TOTAL	235	37	198

PANEL B: Fatalities

	Total Sample	Apology	Non-Apology
Fatalities	101	5	96
Non-Fatalities	134	32	102

PANEL C: History of crises

	Total Sample	Apology	Non-Apology
Previous Firm Crisis	99	16	83
Previous Industry Crisis	168	25	143

PANEL D: Fama-French Industries

	Total Sample	Apology	Non-Apology
Consumer Non-Durables	9	4	5
Consumer Durables	9	2	7
Manufacturing	17	1	16
Energy	31	5	26
Chemicals	14	0	14
Business Equipment	10	4	6
Telecommunications	1	1	0
Utilities	19	0	19
Wholesale, Retail and Some Services	13	7	6
Healthcare, Medical Equipment, and Drugs	16	1	15
Finance, Insurance, and Real Estate	24	2	22
Other	72	10	62

PANEL E: Year of crisis

	Total Sample	Apology	Non-Apology
1983 - 1985	11	0	11
1986 - 1988	15	3	12
1989 - 1991	16	2	14
1992 - 1994	22	1	21
1995 - 1997	32	4	28
1998 - 2000	24	2	22
2001 - 2003	22	3	19
2004 - 2006	25	2	23
2007 - 2009	27	6	21
2010 - 2013	41	14	27

NOTES: Table 3 reports the number of observations of given variables for the full sample of 235 firm crises. The sample is also divided into apology and non-apology groups.

TABLE 4
Descriptive statistics

	Mean	Sig.	Median	Std. Dev.	Min	Max	Skewness	Sig.	Kurtosis	Sig.
CAR [0,+2]	**-0.0178**	***	-0.0107	0.0624	-0.4786	0.2106	**-2.3617**	***	**17.7380**	***
CAR [0,+5]	**-0.0265**	***	-0.0133	0.0821	-0.4875	0.1625	**-2.1459**	***	**11.7887**	***
CAR [0,+10]	**-0.0264**	***	-0.0191	0.0938	-0.3904	0.2712	**-0.5674**	***	**5.6014**	***
CAR [0,+15]	**-0.0316**	***	-0.0210	0.1119	-0.4282	0.3461	**-0.4412**	***	**5.4361**	***
CAR [0,+20]	**-0.0271**	***	-0.0214	0.1242	-0.4765	0.3937	**-0.4482**	***	**4.9926**	***
PREVENTABLE CRISIS	0.2255		0.0000	0.4188	0.0000	1.0000	1.3135		2.7252	
FATALITIES	0.4298		0.0000	0.4961	0.0000	1.0000	0.2837		1.0804	
APOLOGY [0,+2]	0.0638		0.0000	0.2450	0.0000	1.0000	3.5686		13.7349	
APOLOGY [0,+5]	0.0936		0.0000	0.2919	0.0000	1.0000	2.7902		8.7851	
APOLOGY [0,+10]	0.1362		0.0000	0.3437	0.0000	1.0000	2.1216		5.5014	
APOLOGY [0,+15]	0.1574		0.0000	0.3650	0.0000	1.0000	1.8810		4.5382	
APOLOGY [0,+20]	0.1574		0.0000	0.3650	0.0000	1.0000	1.8810		4.5382	
PREVIOUS FIRM CRISIS	0.4213		0.0000	0.4948	0.0000	1.0000	0.3189		1.1017	
PREVIOUS INDUSTRY CRISIS	0.7149		1.0000	0.4524	0.0000	1.0000	-0.9520		1.9063	
REPUTATION	**6.2366**	***	6.2500	0.9732	3.0500	9.1400	-0.2812		3.6118	
PUBLICITY [0,+2]	**0.2978**	***	0.1813	0.4190	-0.5344	1.8921	**1.3015**	***	**4.9633**	***
PUBLICITY [0,+5]	**0.2534**	***	0.1620	0.4087	-0.8227	2.0497	**1.1629**	***	**5.4880**	***
PUBLICITY [0,+10]	**0.2182**	***	0.1476	0.3854	-0.8654	1.9753	**0.9930**	***	**5.7339**	***
PUBLICITY [0,+15]	**0.5178**	***	0.4792	0.5787	-1.3708	2.4342	**0.2725**	*	**3.5969**	*
PUBLICITY [0,+20]	**0.5081**	***	0.4448	0.5813	-1.0342	2.4319	**0.3022**	*	3.3237	
VOLUME [0,+2]	**0.2400**	***	0.1365	0.6693	-1.0510	2.8120	**1.1523**	***	**4.7430**	***
VOLUME [0,+5]	**0.2232**	***	0.1069	0.6323	-1.0856	2.9407	**1.3395**	***	**5.9648**	***
VOLUME [0,+10]	**0.1944**	***	0.0991	0.5659	-1.1002	2.9960	**1.4716**	***	**7.4130**	***
VOLUME [0,+15]	**0.1803**	***	0.1116	0.5322	-0.9585	2.8305	**1.3881**	***	**6.8515**	***
VOLUME [0,+20]	**0.1693**	***	0.1167	0.5141	-0.9609	2.6658	**1.3125**	***	**6.5560**	***
SIZE	**9.8701**	***	9.8799	0.8141	7.6279	11.6064	-0.1485		2.5683	
LEVERAGE	**0.6834**	***	0.6707	0.2861	0.1122	3.9502	**6.3062**	***	**73.6860**	***
M/B RATIO	**4.2665**	***	1.8368	9.4704	0.0010	96.1401	**5.9626**	***	**47.0543**	***

NOTES: Table 4 reports the descriptive statistics for the full sample of 235 crisis firms. Variable definitions can be found in the methodology section. For mean, bolded numbers are to be interprected as the reported mean being statistically different than the expected mean for that variable at a 10%, 5%, and 1% level as noted by *,**,***. For skewness and kurtosis, bolded numbers are to be interprted as rejecting distributional normality at a 10%, 5%, and 1% level as noted by *,**,***. Mean, skewness, and kurtosis significance levels are not calculated for dummy variables.

TABLE 5
Correlation table for equation (6)

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
1	CAR [0,+2]	1.00																											
2	CAR [0,+5]		1.00																										
3	CAR [0,+10]			1.00																									
4	CAR [0,+15]				1.00																								
5	CAR [0,+20]					1.00																							
6	PREVENTABLE CRISIS	-0.10	-0.12	-0.10	-0.08	-0.07	1.00																						
7	FATALITIES	-0.11	-0.13	-0.10	-0.08	-0.05	-0.04	1.00																					
8	APOLOGY [0,+2]	**-0.25**					**0.15**	-0.09	1.00																				
9	APOLOGY [0,+5]		**-0.21**				**0.14**	**-0.16**		1.00																			
10	APOLOGY [0,+10]			-0.12			**0.17**	**-0.22**			1.00																		
11	APOLOGY [0,+15]				-0.05		**0.19**	**-0.26**				1.00																	
12	APOLOGY [0,+20]					-0.06	**0.19**	**-0.26**				1.00	1.00																
13	PREVIOUS FIRM CRISIS	0.07	0.05	0.02	0.02	0.02	-0.01	0.08	**0.13**	0.08	0.04	0.01	0.01	1.00															
14	PREVIOUS INDUSTRY CRISIS	**0.15**	**0.14**	**0.14**	0.11	0.09	0.05	0.11	0.05	0.01	-0.05	-0.04	-0.04	**0.54**	1.00														
15	REPUTATION	0.04	0.04	0.07	0.03	0.05	-0.07	-0.08	-0.04	-0.07	0.04	0.05	0.05	-0.11	-0.05	1.00													
16	PUBLICITY [0,+2]	**-0.34**					**0.16**	**0.15**	0.10					**-0.14**	-0.11	-0.05	1.00												
17	PUBLICITY [0,+5]		**-0.38**				**0.13**	0.12		0.12				-0.12	-0.13	-0.06		1.00											
18	PUBLICITY [0,+10]			**-0.32**			0.12	0.10			**0.14**			-0.09	-0.10	-0.07			1.00										
19	PUBLICITY [0,+15]				**-0.17**		-0.02	0.13				0.03		-0.11	-0.07	0.06				1.00									
20	PUBLICITY [0,+20]					**-0.18**	-0.04	**0.13**					0.02	-0.10	-0.07	0.07					1.00								
21	VOLUME [0,+2]	**-0.48**					-0.02	0.06	**0.20**					-0.05	-0.04	**-0.14**	**0.37**					1.00							
22	VOLUME [0,+5]		**-0.45**				0.00	0.03		**0.27**				-0.03	-0.07	**-0.16**		**0.38**					1.00						
23	VOLUME [0,+10]			**-0.32**			-0.03	0.00			**0.23**			-0.04	-0.10	**-0.14**			**0.32**					1.00					
24	VOLUME [0,+15]				**-0.19**		-0.04	0.02				**0.21**		-0.03	-0.08	-0.12				**0.15**					1.00				
25	VOLUME [0,+20]					**-0.20**	-0.04	0.01					**0.19**	-0.02	-0.06	-0.11					0.10					1.00			
26	SIZE	**0.13**	**0.15**	0.07	0.03	0.00	-0.10	**-0.20**	-0.08	-0.09	-0.03	0.00	0.00	0.12	0.08	**0.55**	**-0.23**	**-0.25**	**-0.22**	-0.07	-0.08	-0.10	-0.09	-0.05	-0.06	-0.06	1.00		
27	LEVERAGE	0.08	0.02	0.10	0.07	0.04	**0.18**	0.02	0.10	0.04	0.02	-0.01	-0.01	0.08	**0.13**	**-0.24**	**-0.11**	-0.10	-0.08	-0.04	-0.05	-0.06	-0.09	-0.08	-0.03	-0.02	**-0.25**	1.00	
28	MARKET-TO-BOOK	-0.01	-0.05	-0.09	**-0.14**	**-0.14**	-0.03	-0.09	-0.05	-0.06	-0.04	-0.06	-0.06	-0.09	-0.10	0.03	-0.03	-0.07	-0.08	0.02	0.01	-0.02	-0.06	-0.06	-0.07	-0.07	0.08	0.08	1.00

NOTES: Table 5 presents the pearson correlation table for full sample of 235 crisis firms. Only correlations relevent to our equation (6) are included. Correlations amongst the same variable but over different event windows are excluded. Bolded correlations are significant at the 5% level. Correlations amongst different variables over different event windows are also excluded. Variable definitions can be found in the methodology section.

TABLE 6

Event study results

PANEL A: Cumulative abnormal returns (day 0 = crisis date)									
WINDOW	FULL SAMPLE	t-stat	Sig.	APOLOGY	t-stat	Sig.	NON-APOLOGY	t-stat	Sig.
[0,+2]	**-1.783%**	**-7.40**	***	**-7.763%**	**-3.02**	***	**-1.376%**	**-7.28**	***
[0,+5]	**-2.654%**	**-12.55**	***	**-8.117%**	**-6.09**	***	**-2.090%**	**-11.10**	***
[0,+10]	**-2.638%**	**-13.61**	***	**-5.397%**	**-6.33**	***	**-2.218%**	**-12.20**	***
[0,+15]	**-3.158%**	**-16.67**	***	**-4.559%**	**-6.94**	***	**-2.896%**	**-15.37**	***
[0,+20]	**-2.708%**	**-14.83**	***	**-4.382%**	**-7.18**	***	**-2.395%**	**-13.00**	***

PANEL B: Difference in means between apology and non-apology portfolios in PANEL A			
WINDOW	DIFFERENCE	t-stat	Sig.
[0,+2]	**-6.388%**	**-9.63**	***
[0,+5]	**-6.026%**	**-21.17**	***
[0,+10]	**-3.179%**	**-20.69**	***
[0,+15]	**-1.663%**	**-15.29**	***
[0,+20]	**-1.987%**	**-19.63**	***

NOTES: Table 6 reports cumulative abnormal return up to the specified day t in event time. Event time is relative to the crisis. Panel A presents the full sample of crisis firms as well as a constrained sample of only apologetic or non-apologetic firms. Panel B presents the difference in means between the apologetic and non-apologetic firms. *, **, *** denote statistical significance at the 10%, the 5%, and the 1% level, respectively.

TABLE 7
Equation (6) results

		CUMULATIVE ABNORMAL RETURN									
Parameter	Predicted Sign	[0,+2]	Sig.	[0,+5]	Sig.	[0,+10]	Sig.	[0,+15]	Sig.	[0,+20]	Sig.
INTERCEPT		0.0221		0.1017		0.1302		0.1647		**0.2708**	**
		0.0710		*0.1008*		*0.1085*		*0.1192*		*0.1234*	
PREVENTABLE CRISIS	-	**-0.0228**	***	**-0.0300**	**	**-0.0404**	**	**-0.0428**	*	**-0.0470**	**
		0.0084		*0.0123*		*0.0167*		*0.0220*		*0.0224*	
FATALITIES	-	**-0.0183**	**	**-0.0258**	***	**-0.0298**	**	**-0.0298**	*	**-0.0305**	*
		0.0076		*0.0096*		*0.0129*		*0.0163*		*0.0179*	
APOLOGY	-	-0.1009		**-0.0685**	*	**-0.0685**	**	**-0.0537**	*	**-0.0720**	**
		0.0649		*0.0361*		*0.0332*		*0.0294*		*0.0363*	
APOLOGY * PREVENTABLE CRISIS	+	**0.1129**	**	**0.1029**	**	**0.1061**	**	**0.0935**	**	**0.1162**	**
		0.0558		*0.0472*		*0.0413*		*0.0411*		*0.0498*	
APOLOGY * FATALITIES	?	0.0287		-0.0042		0.0415		0.0442		0.0660	
		0.0592		*0.0889*		*0.0514*		*0.0516*		*0.0752*	
PREVIOUS FIRM CRISIS	-	-0.0025		0.0004		-0.0016		0.0030		0.0066	
		0.0083		*0.0116*		*0.0148*		*0.0186*		*0.0196*	
PREVIOUS INDUSTRY CRISIS	+	**0.0269**	**	**0.0246**	*	**0.0306**	*	**0.0387**	**	0.0350	
		0.0122		*0.0130*		*0.0162*		*0.0188*		*0.0231*	
REPUTATION	+	-0.0058		-0.0064		0.0077		0.0056		0.0107	
		0.0049		*0.0058*		*0.0076*		*0.0120*		*0.0132*	
PUBLICITY	-	-0.0155		**-0.0433**	***	**-0.0525**	***	**-0.0440**	***	**-0.0609**	***
		0.0126		*0.0150*		*0.0179*		*0.0141*		*0.0154*	
VOLUME	-	**-0.0360**	***	**-0.0445**	***	**-0.0414**	***	**-0.0373**	**	**-0.0415**	**
		0.0080		*0.0101*		*0.0131*		*0.0180*		*0.0203*	
SIZE	?	0.0068		0.0021		-0.0091		-0.0083		-0.0194	
		0.0078		*0.0115*		*0.0112*		*0.0136*		*0.0128*	
LEVERAGE	?	0.0000		-0.0106		**0.0332**	*	**0.0402**	*	0.0154	
		0.0115		*0.0147*		*0.0190*		*0.0225*		*0.0252*	
MARKET-TO-BOOK	?	-0.0002		**-0.0007**	*	**-0.0011**	**	**-0.0021**	***	**-0.0026**	***
		0.0002		*0.0003*		*0.0005*		*0.0008*		*0.0009*	
Industry Effects		*Yes*		*Yes*		*Yes*		*Yes*		*Yes*	
Year Effects		*Yes*		*Yes*		*Yes*		*Yes*		*Yes*	
N		235		235		235		235		235	
# of Apologetic Firms		15		22		31		37		37	
R-Squared		40.72%		39.23%		31.06%		24.37%		26.21%	

NOTES: The dependent variable is the cumulative abnormal return in the specified windows. PREVENTABLE CRISIS is a dummy equal to 1 for firms whose crisis falls into one of the three preventable crisis categories as defined by the SCCT, FATALITIES is a dummy equal to 1 for firms who have deaths due to the crisis, APOLOGY is a dummy equal to 1 for firms that apologize in the event window as a response to the crisis, PREVIOUS FIRM CRISIS is a dummy equal to 1 for firms that had a previous crisis in the sample, PREVIOUS INDUSTRY CRISIS is a dummy equal to 1 for firms that had a crisis in an industry where a previous crisis had occurred in the sample, REPUTATION is the annually reported score from 'The World's Most Admired Companies" list published by Fortune Magazine, PUBLICITY is the log ratio of average daily news coverage for the firm in the event window to the average daily news coverage of the firm in the estimation window, VOLUME is the ratio of average volume for the firm in the event window divided by average volume in the estimation window, SIZE is the market capitalization of the firm the day before the crisis in 2011$s, LEVERAGE is the ratio of total liabilities to total assets reported on the most recent quarterly balance sheet, M/B is the ratio of market capitalization the day before the crisis to book equity of the most recent quarter preceding the crisis. The number reported on the same line as the parameter name is the coefficient and the number reported below in italics is the robust standard error. *, **, *** denote statistical significance at the 10%, the 5%, and the 1% level, respectively, using a two tail test.

TABLE 8

Wald test results on equation (6)

	Full Test	Reduced Form	[0,+2]	Sig.	[0,+5]	Sig.	[0,+10]	Sig.	[0,+15]	Sig.	[0,+20]	Sig.
Preventable Apology VS Preventable Non-apology	INT + B1 + B3 + B4 = INT + B1	B3 + B4 = 0	0.36		1.21		1.76		1.62		1.46	
			0.5507		*0.2719*		*0.1859*		*0.2039*		*0.2284*	
Non-preventable Apology VS Non-preventable Non-apology	INT + B3 = INT	B3 = 0	2.41		**3.59**	*	**4.26**	**	**3.33**	*	**3.93**	**
			0.1218		*0.0594*		*0.0402*		*0.0696*		*0.0488*	
Fatalities Apology VS Fatalities Non-apology	INT + B2 + B3 + B5 = INT + B2	B3 + B5 = 0	**4.25**	**	0.76		0.38		0.04		0.01	
			0.0406		*0.3833*		*0.5364*		*0.8394*		*0.9319*	
Preventable Apology VS Non-preventable Apology	INT + B1 + B3 + B4 = INT + B3	B1 + B4 = 0	2.52		2.49		**3.01**	*	2.28		2.39	
			0.1137		*0.1160*		*0.0841*		*0.1324*		*0.1237*	

NOTES: Table 8 reports the results of Wald tests conducted on equation (6). INT = intercept, B1 = the beta on PREVENTABLE CRISIS, B2 = the beta on FATALITIES, B3 = the beta on APOLOGY, B4 = the beta on APOLOGY * PREVENTABLE CRISIS, and B5 = the beta on APOLOGY * FATALITIES. The number reported on the same line as the constraints being tested is F-stat and the number reported below in italics is the p-value. *, **, *** denote statistical significance at the 10%, the 5%, and the 1% level, respectively, using a two tail test.

TABLE 9

Robustness: Equation (6) results using Fama French model to estimate CAR

		CUMULATIVE ABNORMAL RETURN									
Parameter	Predicted Sign	[0,+2]	Sig.	[0,+5]	Sig.	[0,+10]	Sig.	[0,+15]	Sig.	[0,+20]	Sig.
INTERCEPT		0.0791		**0.1778**	*	**0.2338**	**	**0.3039**	**	**0.4636**	***
		0.0702		*0.1003*		*0.1158*		*0.1196*		*0.1396*	
PREVENTABLE CRISIS	-	-0.0055		-0.0145		-0.0179		-0.0078		-0.0163	
		0.0088		*0.0123*		*0.0150*		*0.0183*		*0.0194*	
FATALITIES	-	**-0.0211**	**	**-0.0249**	**	-0.0212		-0.0223		-0.0175	
		0.0083		*0.0111*		*0.0137*		*0.0168*		*0.0186*	
APOLOGY	-	**-0.0980**	*	-0.0589		-0.0379		-0.0169		0.0172	
		0.0527		*0.0425*		*0.0425*		*0.0488*		*0.0759*	
APOLOGY * PREVENTABLE CRISIS	+	**0.0955**	**	**0.0898**	**	**0.0807**	**	0.0506		0.0167	
		0.0473		*0.0426*		*0.0381*		*0.0392*		*0.0789*	
APOLOGY * FATALITIES	?	0.0002		0.0001		0.0002		0.0001		0.0002	
		0.0002		*0.0004*		*0.0002*		*0.0003*		*0.0005*	
PREVIOUS FIRM CRISIS	-	0.0089		0.0130		0.0151		0.0239		**0.0381**	*
		0.0080		*0.0124*		*0.0158*		*0.0188*		*0.0208*	
PREVIOUS INDUSTRY CRISIS	+	0.0057		-0.0084		-0.0134		-0.0057		-0.0281	
		0.0109		*0.0179*		*0.0228*		*0.0244*		*0.0305*	
REPUTATION	+	-0.0043		-0.0095		-0.0017		0.0046		0.0103	
		0.0050		*0.0060*		*0.0078*		*0.0101*		*0.0119*	
PUBLICITY	-	-0.0170		**-0.0568**	***	**-0.0664**	***	**-0.0372**	***	**-0.0617**	***
		0.0126		*0.0201*		*0.0215*		*0.0130*		*0.0169*	
VOLUME	-	**-0.0344**	***	**-0.0433**	***	**-0.0406**	***	**-0.0319**	*	**-0.0452**	*
		0.0081		*0.0100*		*0.0129*		*0.0184*		*0.0237*	
SIZE	?	0.0023		-0.0004		-0.0104		-0.0210		**-0.0369**	***
		0.0068		*0.0100*		*0.0111*		*0.0129*		*0.0140*	
LEVERAGE	?	0.0001		-0.0143		0.0129		0.0125		-0.0501	
		0.0097		*0.0143*		*0.0331*		*0.0351*		*0.0647*	
MARKET-TO-BOOK	?	0.0000		0.0000		0.0000		0.0000		**0.0000**	**
		0.0000		*0.0000*		*0.0000*		*0.0000*		*0.0000*	
Industry Effects		*Yes*		*Yes*		*Yes*		*Yes*		*Yes*	
Year Effects		*Yes*		*Yes*		*Yes*		*Yes*		*Yes*	
N		235		235		235		235		235	
# of Apologetic Firms		15		22		31		37		37	
R-Squared		31.78%		26.56%		18.11%		14.20%		12.49%	

NOTES: The dependent variable is the cumulative abnormal return in the specified windows estimated using the Fama French three factor model. PREVENTABLE CRISIS is a dummy equal to 1 for firms whose crisis falls into one of the three preventable crisis categories as defined by the SCCT, FATALITIES is a dummy equal to 1 for firms that had deaths due to the crisis, APOLOGY is a dummy equal to 1 for firms that apologize in the event window as a response to the crisis, PREVIOUS FIRM CRISIS is a dummy equal to 1 for firms that had a previous crisis in the sample, PREVIOUS INDUSTRY CRISIS is a dummy equal to 1 for firms that had a crisis in an industry where a previous crisis had occurred in the sample, REPUTATION is the annually reported score from 'The World's Most Admired Companies" list published by Fortune Magazine, PUBLICITY is the log ratio of average daily news coverage for the firm in the event window to the average daily news coverage of the firm in the estimation window, VOLUME is the ratio of average volume for the firm in the event window divided by average volume in the estimation window, SIZE is the market capitalization of the firm the day before the crisis in 2011$s, LEVERAGE is the ratio of total liabilities to total assets reported on the most recent quarterly balance sheet, M/B is the ratio of market capitalization the day before the crisis to book equity of the most recent quarter preceding the crisis. The number reported on the same line as the parameter name is the coefficient and the number reported below in italics is the robust standard error. *, **, *** denote statistical significance at the 10%, the 5%, and the 1% level, respectively.

TABLE 10

Robustness: Instrumental Variable with 2SLS - First Stage

Parameter	Predicted Sign	CUMULATIVE ABNORMAL RETURN [0,+2]	Sig.	[0,+5]	Sig.	[0,+10]	Sig.	[0,+15]	Sig.	[0,+20]	Sig.
INTERCEPT		-0.7895		1.6164		-0.1575		-0.8785		-0.7701	
		3.0700		*2.7660*		*2.6978*		*2.5492*		*2.5664*	
ADVERTISING INTENSITY	+	10.6778		**17.9224**	*	**21.0936**	***	**15.2143**	**	**14.7509**	*
		19.5574		*9.2391*		*7.9357*		*7.6679*		*7.7616*	
PREVENTABLE CRISIS	+	**1.5760**	**	**1.3093**	**	**1.3868**	***	**1.3765**	***	**1.3469**	***
		0.6268		*0.5690*		*0.4976*		*0.4377*		*0.4395*	
FATALITIES	?	**-1.2780**	*	**-1.9750**	***	**-2.0446**	***	**-2.1157**	***	**-2.0529**	***
		0.6512		*0.6013*		*0.4965*		*0.4645*		*0.4570*	
PREVIOUS FIRM CRISIS	+	**2.3640**	***	**1.5244**	**	**1.4876**	**	0.8151		0.7745	
		0.8257		*0.7283*		*0.6145*		*0.5794*		*0.5679*	
PREVIOUS INDUSTRY CRISIS	-	-0.9910		-0.6459		-0.8226		-0.3684		-0.3868	
		0.9343		*0.8111*		*0.6715*		*0.5738*		*0.5642*	
REPUTATION	?	0.3931		0.1992		**0.6383**	**	**0.4407**	*	0.4175	
		0.3093		*0.3512*		*0.3054*		*0.2646*		*0.2612*	
PUBLICITY	+	0.2230		-0.1559		0.3932		0.2104		0.2387	
		0.8888		*0.7697*		*0.7030*		*0.3370*		*0.3353*	
VOLUME	+	**1.2338**	**	**1.5724**	***	**1.2802**	***	**1.2424**	***	**1.1733**	***
		0.5589		*0.4600*		*0.3998*		*0.3406*		*0.3580*	
SIZE	?	**-0.6229**	*	**-0.6253**	*	**-0.6536**	**	-0.3869		-0.3750	
		0.3430		*0.3776*		*0.3220*		*0.2952*		*0.2909*	
LEVERAGE	?	0.6820		0.2591		0.1348		-0.2499		-0.2601	
		0.7041		*0.7655*		*0.5574*		*0.6482*		*0.6821*	
MARKET-TO-BOOK	?	-0.0597		-0.0704		-0.0500		-0.0535		-0.0548	
		0.0627		*0.0589*		*0.0391*		*0.0392*		*0.0399*	
Industry Effects		*No*		*No*		*No*		*No*		*No*	
Year Effects		*No*		*No*		*No*		*No*		*No*	
N		235		235		235		235		235	
# of Apologetic Firms		15		22		31		37		37	
Pseudo R-Squared		24.29%		26.26%		25.10%		22.00%		20.98%	

NOTES: Table 10 presents the results of the first stage of the 2SLS procedure. The dependent variable is the binary action of apologizing estimated using a Logit model. ADVERTISING INTENSITY is the ratio of advertising expenses over sales for the most recent fiscal year, PREVENTABLE CRISIS is a dummy equal to 1 for firms whose crisis falls into one of the three preventable crisis categories as defined by the SCCT, FATALITIES is a dummy equal to 1 for firms who have deaths due to the crisis, PREVIOUS FIRM CRISIS is a dummy equal to 1 for firms that had a previous crisis in the sample, PREVIOUS INDUSTRY CRISIS is a dummy equal to 1 for firms that had a crisis in an industry where a previous crisis had occurred in the sample, REPUTATION is the annually reported score from 'The World's Most Admired Companies" list published by Fortune Magazine, PUBLICITY is the log ratio of average daily news coverage for the firm in the event window to the average daily news coverage of the firm in the estimation window, VOLUME is the ratio of average volume for the firm in the event window divided by average volume in the estimation window, SIZE is the market capitalization of the firm the day before the crisis in 2011$s, LEVERAGE is the ratio of total liabilities to total assets reported on the most recent quarterly balance sheet, M/B is the ratio of market capitalization the day before the crisis to book equity of the most recent quarter preceding the crisis. The number reported on the same line as the parameter name is the coefficient and the number reported below in italics is the robust standard error. *, **, *** denote statistical significance at the 10%, the 5%, and the 1% level, respectively, using a two tail test.

TABLE 11

Robustness: Instrumental Variable with 2SLS - Second Stage

Parameter	Predicted Sign	CUMULATIVE ABNORMAL RETURN [0,+2]	Sig.	[0,+5]	Sig.	[0,+10]	Sig.	[0,+15]	Sig.	[0,+20]	Sig.
INTERCEPT		0.0252		0.1532		0.1511		**0.2175**	*	**0.2691**	**
		0.0694		*0.1018*		*0.1126*		*0.1212*		*0.1357*	
PREVENTABLE CRISIS	-	**-0.0201**	*	**-0.0329**	**	**-0.0562**	**	-0.0558		**-0.0795**	**
		0.0110		*0.0157*		*0.0256*		*0.0380*		*0.0392*	
FATALITIES	-	**-0.0159**	*	**-0.0241**	**	-0.0200		**-0.0401**	*	-0.0351	
		0.0091		*0.0102*		*0.0163*		*0.0225*		*0.0275*	
APOLOGY_fit	-	**-0.1729**	***	**-0.1925**	***	-0.0890		**-0.1652**	*	-0.0905	
		0.0575		*0.0729*		*0.0744*		*0.0994*		*0.1260*	
APOLOGY_fit * PREVENTABLE CRISIS	+	**0.1846**	***	**0.2035**	**	**0.1932**	**	**0.2111**	*	**0.2293**	*
		0.0705		*0.0936*		*0.0943*		*0.1152*		*0.1348*	
APOLOGY_fit * FATALITIES	?	**-0.2019**	*	-0.3448		-0.1597		-0.0731		0.1821	
		0.1138		*0.2097*		*0.1234*		*0.1682*		*0.2416*	
PREVIOUS FIRM CRISIS	-	0.0103		0.0179		0.0072		0.0153		0.0093	
		0.0083		*0.0118*		*0.0162*		*0.0193*		*0.0209*	
PREVIOUS INDUSTRY CRISIS	+	**0.0274**	**	0.0219		**0.0288**	*	**0.0370**	*	0.0355	
		0.0133		*0.0132*		*0.0164*		*0.0188*		*0.0232*	
REPUTATION	+	-0.0021		-0.0032		0.0118		0.0120		0.0115	
		0.0048		*0.0056*		*0.0082*		*0.0127*		*0.0140*	
PUBLICITY	-	-0.0136		**-0.0397**	***	**-0.0491**	***	**-0.0464**	***	**-0.0653**	***
		0.0144		*0.0151*		*0.0179*		*0.0142*		*0.0154*	
VOLUME	-	**-0.0243**	**	-0.0174		**-0.0294**	*	-0.0151		-0.0433	
		0.0093		*0.0126*		*0.0159*		*0.0258*		*0.0308*	
SIZE	?	0.0042		-0.0024		-0.0135		-0.0159		-0.0215	
		0.0076		*0.0111*		*0.0119*		*0.0137*		*0.0140*	
LEVERAGE	?	0.0030		-0.0064		0.0285		0.0385		0.0240	
		0.0126		*0.0121*		*0.0197*		*0.0236*		*0.0261*	
MARKET-TO-BOOK	?	-0.0001		-0.0006		-0.0008		**-0.0021**	***	**-0.0025**	***
		0.0003		*0.0004*		*0.0005*		*0.0008*		*0.0009*	
Industry Effects		*Yes*		*Yes*		*Yes*		*Yes*		*Yes*	
Year Effects		*Yes*		*Yes*		*Yes*		*Yes*		*Yes*	
N		235		235		235		235		235	
# of Apologetic Firms		15		22		31		37		37	
R-Squared		37.97%		41.41%		30.45%		23.89%		24.97%	

NOTES: Table 11 presents the results of the second stage of the 2SLS procedure. The dependent variable is the cumulative abnormal return in the specified windows estimated OLS. PREVENTABLE CRISIS is a dummy equal to 1 for firms whose crisis falls into one of the three preventable crisis categories as defined by the SCCT, FATALITIES is a dummy equal to 1 for firms who have deaths due to the crisis, APOLOGY_fit is the estimated likelihood of apology obtained from the first stage (Equation (10); Table 11), PREVIOUS FIRM CRISIS is a dummy equal to 1 for firms that had a previous crisis in the sample, PREVIOUS INDUSTRY CRISIS is a dummy equal to 1 for firms that had a crisis in an industry where a previous crisis had occurred in the sample, REPUTATION is the annually reported score from 'The World's Most Admired Companies" list published by Fortune Magazine, PUBLICITY is the log ratio of average daily news coverage for the firm in the event window to the average daily news coverage of the firm in the estimation window, VOLUME is the ratio of average volume for the firm in the event window divided by average volume in the estimation window, SIZE is the market capitalization of the firm the day before the crisis in 2011$s, LEVERAGE is the ratio of total liabilities to total assets reported on the most recent quarterly balance sheet, M/B is the ratio of market capitalization the day before the crisis to book equity of the most recent quarter preceding the crisis. The number reported on the same line as the parameter name is the coefficient and the number reported below in italics is the robust standard error. *, **, *** denote statistical significance at the 10%, the 5%, and the 1% level, respectively, using a two tail test.

TABLE 12

Robustness: Static apology window

PANEL A: Two-day apology window [0,+2]

Parameter	Predicted Sign	CUMULATIVE ABNORMAL RETURN [0,+2]	Sig.	[0,+5]	Sig.	[0,+10]	Sig.	[0,+15]	Sig.	[0,+20]	Sig.
INTERCEPT		0.0221		0.0896		0.1259		0.1601		**0.2693**	**
		0.0710		*0.1007*		*0.1077*		*0.1206*		*0.1237*	
PREVENTABLE CRISIS	-	**-0.0228**	***	**-0.0289**	**	**-0.0356**	**	-0.0335		**-0.0420**	**
		0.0084		*0.0122*		*0.0158*		*0.0203*		*0.0211*	
FATALITIES	-	**-0.0183**	**	**-0.0255**	***	**-0.0282**	**	**-0.0269**	*	-0.0245	
		0.0076		*0.0096*		*0.0122*		*0.0157*		*0.0173*	
APOLOGY	-	-0.1009		**-0.1009**	*	-0.1119		-0.0266		-0.0418	
		0.0649		*0.0603*		*0.0733*		*0.0707*		*0.0817*	
APOLOGY * PREVENTABLE CRISIS	+	**0.1129**	**	**0.1353**	**	**0.1563**	**	0.0846		**0.1582**	*
		0.0558		*0.0671*		*0.0762*		*0.0767*		*0.0891*	
APOLOGY * FATALITIES	?	0.0287		0.0223		0.0816		0.0274		0.0352	
		0.0592		*0.0915*		*0.0719*		*0.0771*		*0.1011*	
PREVIOUS FIRM CRISIS	-	-0.0025		0.0007		-0.0016		0.0027		0.0051	
		0.0083		*0.0116*		*0.0145*		*0.0185*		*0.0193*	
PREVIOUS INDUSTRY CRISIS	+	**0.0269**	**	**0.0230**	*	**0.0269**	*	**0.0359**	*	0.0310	
		0.0122		*0.0129*		*0.0162*		*0.0191*		*0.0228*	
REPUTATION	+	-0.0058		-0.0080		0.0044		0.0030		0.0065	
		0.0049		*0.0057*		*0.0075*		*0.0122*		*0.0133*	
PUBLICITY	-	-0.0155		**-0.0425**	***	**-0.0536**	***	**-0.0438**	***	**-0.0600**	***
		0.0126		*0.0146*		*0.0175*		*0.0145*		*0.0158*	
VOLUME	-	**-0.0360**	***	**-0.0467**	***	**-0.0442**	***	**-0.0405**	**	**-0.0465**	**
		0.0080		*0.0102*		*0.0121*		*0.0175*		*0.0202*	
SIZE	?	0.0068		0.0042		-0.0083		-0.0081		-0.0191	
		0.0078		*0.0115*		*0.0111*		*0.0137*		*0.0127*	
LEVERAGE	?	0.0000		-0.0083		**0.0325**	*	**0.0423**	*	0.0116	
		0.0115		*0.0153*		*0.0194*		*0.0220*		*0.0237*	
MARKET-TO-BOOK	?	-0.0002		**-0.0007**	**	**-0.0011**	**	**-0.0021**	**	**-0.0025**	***
		0.0002		*0.0003*		*0.0005*		*0.0008*		*0.0009*	
Industry Effects		*Yes*		*Yes*		*Yes*		*Yes*		*Yes*	
Year Effects		*Yes*		*Yes*		*Yes*		*Yes*		*Yes*	
N		235		235		235		235		235	
# of Apologetic Firms		15		15		15		15		15	
R-Squared		40.72%		39.81%		31.20%		23.13%		25.83%	

TABLE 12 (Continued)

PANEL B: Five-day apology window [0,+5]

Parameter	Predicted Sign	CUMULATIVE ABNORMAL RETURN [0,+5]	Sig.	[0,+10]	Sig.	[0,+15]	Sig.	[0,+20]	Sig.
INTERCEPT		0.1017		0.1348		0.1761		**0.2955**	**
		0.1008		*0.1086*		*0.1211*		*0.1264*	
PREVENTABLE CRISIS	-	**-0.0300**	**	**-0.0370**	**	**-0.0360**	*	**-0.0454**	**
		0.0123		*0.0158*		*0.0204*		*0.0212*	
FATALITIES	-	**-0.0258**	***	**-0.0273**	**	**-0.0283**	*	-0.0269	
		0.0096		*0.0125*		*0.0158*		*0.0173*	
APOLOGY	-	**-0.0685**	*	-0.0620		-0.0441		-0.0691	
		0.0361		*0.0442*		*0.0425*		*0.0508*	
APOLOGY * PREVENTABLE CRISIS	+	**0.1029**	**	**0.1137**	**	**0.0918**	*	**0.1598**	**
		0.0472		*0.0523*		*0.0517*		*0.0615*	
APOLOGY * FATALITIES	?	-0.0042		0.0422		0.0395		0.0567	
		0.0889		*0.0593*		*0.0609*		*0.0874*	
PREVIOUS FIRM CRISIS	-	0.0004		-0.0026		0.0037		0.0070	
		0.0116		*0.0146*		*0.0186*		*0.0195*	
PREVIOUS INDUSTRY CRISIS	+	**0.0246**	*	**0.0288**	*	**0.0365**	*	0.0321	
		0.0130		*0.0163*		*0.0190*		*0.0228*	
REPUTATION	+	-0.0064		0.0062		0.0044		0.0091	
		0.0058		*0.0074*		*0.0120*		*0.0132*	
PUBLICITY	-	**-0.0433**	***	**-0.0540**	***	**-0.0443**	***	**-0.0609**	***
		0.0150		*0.0181*		*0.0144*		*0.0157*	
VOLUME	-	**-0.0445**	***	**-0.0434**	***	**-0.0380**	**	**-0.0427**	**
		0.0101		*0.0125*		*0.0178*		*0.0197*	
SIZE	?	0.0021		-0.0103		-0.0104		**-0.0230**	*
		0.0115		*0.0112*		*0.0136*		*0.0129*	
LEVERAGE	?	-0.0106		0.0306		**0.0408**	*	0.0108	
		0.0147		*0.0189*		*0.0222*		*0.0239*	
MARKET-TO-BOOK	?	**-0.0007**	*	**-0.0011**	**	**-0.0021**	***	**-0.0026**	***
		0.0003		*0.0005*		*0.0008*		*0.0009*	
Industry Effects		*Yes*		*Yes*		*Yes*		*Yes*	
Year Effects		*Yes*		*Yes*		*Yes*		*Yes*	
N		235		235		235		235	
# of Apologetic Firms		22		22		22		22	
R-Squared		39.23%		30.19%		23.51%		26.35%	

TABLE 12 (Continued)

PANEL C: Ten-day apology window [0,+10]

Parameter	Predicted Sign	CUMULATIVE ABNORMAL RETURN [0,+10]	Sig.	[0,+15]	Sig.	[0,+20]	Sig.
INTERCEPT		0.1302		0.1803		**0.2944**	**
		0.1085		*0.1192*		*0.1233*	
PREVENTABLE CRISIS	-	**-0.0404**	**	**-0.0409**	*	**-0.0515**	**
		0.0167		*0.0215*		*0.0218*	
FATALITIES	-	**-0.0298**	**	**-0.0315**	*	**-0.0312**	*
		0.0129		*0.0163*		*0.0178*	
APOLOGY	-	**-0.0685**	**	**-0.0643**	*	**-0.0913**	**
		0.0332		*0.0331*		*0.0392*	
APOLOGY * PREVENTABLE CRISIS	+	**0.1061**	**	**0.1025**	**	**0.1596**	***
		0.0413		*0.0440*		*0.0517*	
APOLOGY * FATALITIES	?	0.0415		0.0502		0.0728	
		0.0514		*0.0513*		*0.0714*	
PREVIOUS FIRM CRISIS	-	-0.0016		0.0048		0.0082	
		0.0148		*0.0189*		*0.0195*	
PREVIOUS INDUSTRY CRISIS	+	**0.0306**	*	**0.0379**	**	0.0346	
		0.0162		*0.0187*		*0.0225*	
REPUTATION	+	0.0077		0.0056		0.0106	
		0.0076		*0.0121*		*0.0132*	
PUBLICITY	-	**-0.0525**	***	**-0.0435**	***	**-0.0605**	***
		0.0179		*0.0141*		*0.0154*	
VOLUME	-	**-0.0414**	***	**-0.0357**	**	**-0.0397**	**
		0.0131		*0.0181*		*0.0198*	
SIZE	?	-0.0091		-0.0098		**-0.0213**	*
		0.0112		*0.0136*		*0.0127*	
LEVERAGE	?	**0.0332**	*	**0.0412**	*	0.0130	
		0.0190		*0.0226*		*0.0247*	
MARKET-TO-BOOK	?	**-0.0011**	**	**-0.0021**	***	**-0.0026**	***
		0.0005		*0.0008*		*0.0009*	
Industry Effects		*Yes*		*Yes*		*Yes*	
Year Effects		*Yes*		*Yes*		*Yes*	
N		235		235		235	
# of Apologetic Firms		31		31		31	
R-Squared		31.06%		24.59%		27.75%	

NOTES: The dependent variable is the cumulative abnormal return in the specified windows. PREVENTABLE CRISIS is a dummy equal to 1 for firms whose crisis falls into one of the three preventable crisis categories as defined by the SCCT, FATALITIES is a dummy equal to 1 for firms that had deaths due to the crisis, APOLOGY is a dummy equal to 1 for firms that apologize in the first reported event window in each panel, PREVIOUS FIRM CRISIS is a dummy equal to 1 for firms that had a previous crisis in the sample, PREVIOUS INDUSTRY CRISIS is a dummy equal to 1 for firms that had a crisis in an industry where a previous crisis had occurred in the sample, REPUTATION is the annually reported score from 'The World's Most Admired Companies" list published by Fortune Magazine, PUBLICITY is the log ratio of average daily news coverage for the firm in the event window to the average daily news coverage of the firm in the estimation window, VOLUME is the ratio of average volume for the firm in the event window divided by average volume in the estimation window, SIZE is the market capitalization of the firm the day before the crisis in 2011$s, LEVERAGE is the ratio of total liabilities to total assets reported on the most recent quarterly balance sheet, M/B is the ratio of market capitalization the day before the crisis to book equity of the most recent quarter preceding the crisis. The number reported on the same line as the parameter name is the coefficient and the number reported below in italics is the robust standard error. *, **, *** denote statistical significance at the 10%, the 5%, and the 1% level, respectively.

TABLE 13

Robustness: Nonparametric Test

	CUMULATIVE ABNORMAL RETURN									
Parameter	[0,+2]	Sig.	[0,+5]	Sig.	[0,+10]	Sig.	[0,+15]	Sig.	[0,+20]	Sig.
PANEL A: Full Sample										
Apology vs. Non-apology	-1.794	*	**-2.345**	**	**-1.676**	*	-1.220		-0.993	
	0.0728		*0.0190*		*0.0938*		*0.2225*		*0.3206*	
N	235		235		235		235		235	
# of Apologetic Firms	15		22		31		37		37	
PANEL B: Non-preventable Crisis										
Apology vs. Non-apology	**-2.162**	*	**-3.204**	***	**-3.205**	***	**-2.452**	**	**-2.059**	*
	0.0306		*0.0014*		*0.0014*		*0.0142*		*0.0395*	
N	168		168		168		168		168	
# of Apologetic Firms	8		13		19		22		22	
PANEL C: Preventable Crisis										
Apology vs. Non-apology	0.578		1.232		**2.357**	**	**1.777**	*	1.402	
	0.5633		*0.2180*		*0.0184*		*0.0756*		*0.1609*	
N	53		53		53		53		53	
# of Apologetic Firms	7		9		13		15		15	
PANEL D: Fatalities										
Apology vs. Non-apology	**2.177**	**	0.888		1.096		1.080		0.845	
	0.0295		*0.3745*		*0.2731*		*0.2800*		*0.3979*	
N	101		101		101		101		101	
# of Apologetic Firms	4		4		5		5		5	

NOTES: Table 13 presents the results of the nonparametric Wilcoxon rank sum procedure to assess the statistical significance of the difference in values between two groups. Panel A looks at all crisis types and compares apology to non-apology. Panel B looks at just the non-preventable group and compares apology to non-apology. Panel C looks at only the preventable crisis group and compares apology to non-apology. Panel D looks at firms with fatalities and compares apology to non-apology. Reported values are the Z-score with the p-value reported in italics below the Z-score. *, **, *** denote statistical significance at the 10%, the 5%, and the 1% level, respectively.

TABLE 14

Robustness: Event study results when apology = event

Cumulative abnormal returns by crisis type									
WINDOW	NON-PREVENTABLE	t-stat	Sig.	PREVENTABLE	t-stat	Sig.	DIFFERENCE		
[0,+2]	**-2.947%**	**-2.93**	***	**-2.049%**	**-2.47**	**	**-0.898%**	**3.49**	***
[0,+5]	**-4.538%**	**-5.11**	***	-1.304%	-1.33		**-3.234%**	**11.99**	***
[0,+10]	**-4.774%**	**-6.26**	***	-0.307%	-0.36		**-4.467%**	**19.07**	***
[0,+15]	**-4.422%**	**-6.49**	***	-0.791%	-0.97		**-3.631%**	**16.66**	***
[0,+20]	**-3.937%**	**-6.27**	***	**1.695%**	**2.19**	**	**-5.633%**	**27.35**	***

NOTES: Table 14 reports cumulative abnormal return up to the specified day *t* in event time. Event time is relative to the crisis with the first day of the event window starting at the apology. The table shows the CAR of 51 apologetic firms divided into crisis type by accidental crisis firms and preventable crisis firms. The difference in means between the two crisis types is also reported. *, **, *** denote statistical significance at the 10%, the 5%, and the 1% level, respectively.

TABLE 15

Summary of main findings and robustness findings

	Main Findings	Fama French Model	2SLS	Static Apology	Nonparametric	Apology Event Window
Hypothesis 1	✔	✖	✔	✖	✔	✔
Hypothesis 2	✔	✔	✔	✔	✔	✔
Hypothesis 3	✖	✖	✖	✖	✖	

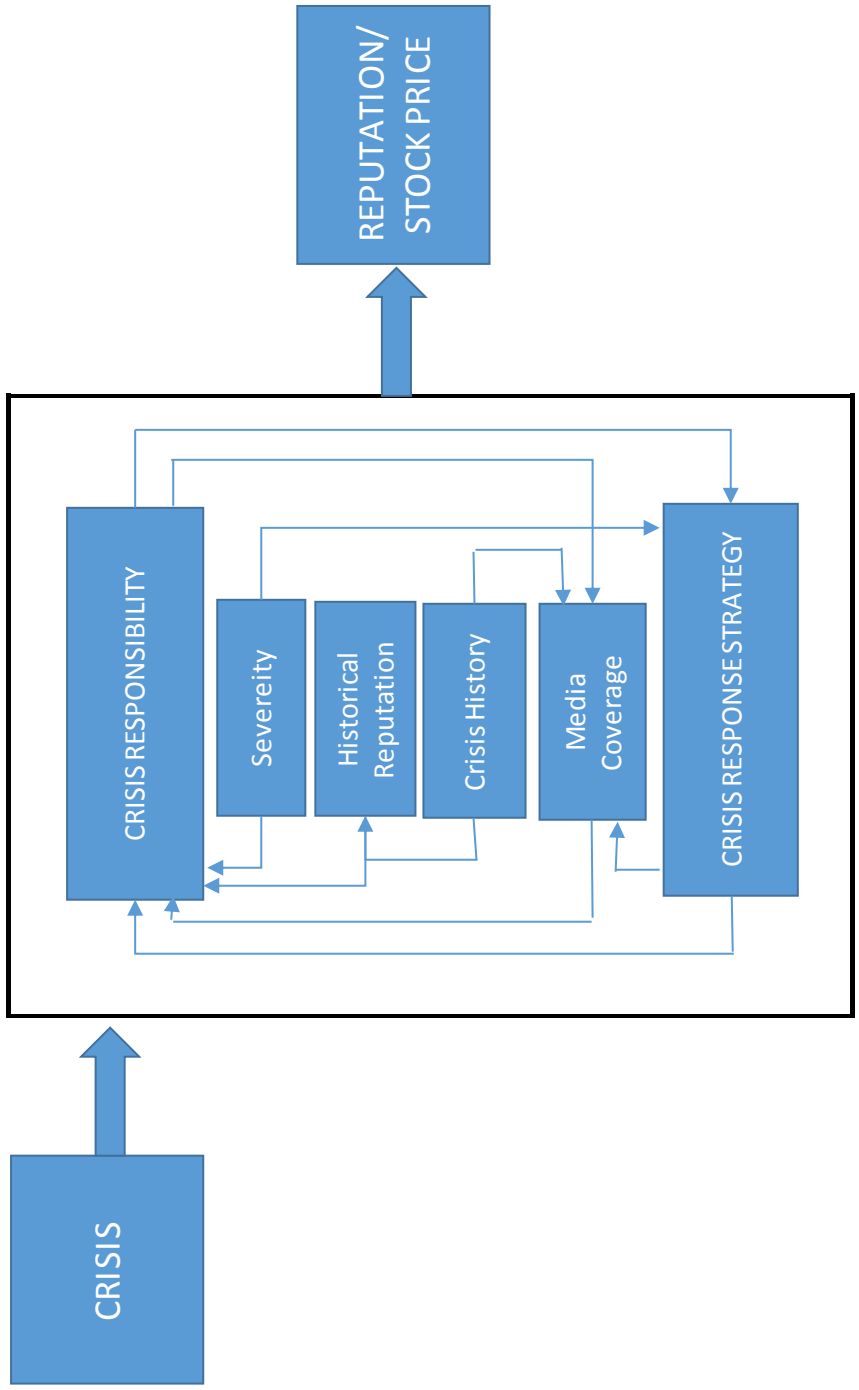
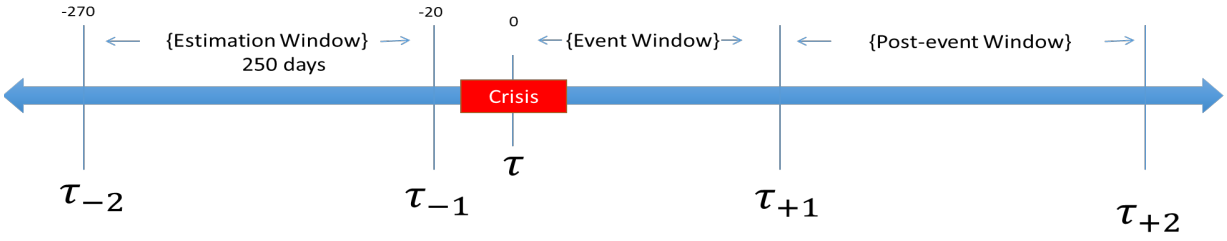


Figure 1 Situational Crisis Communication Theory

Figure 2 Event study timeline (crisis = event)



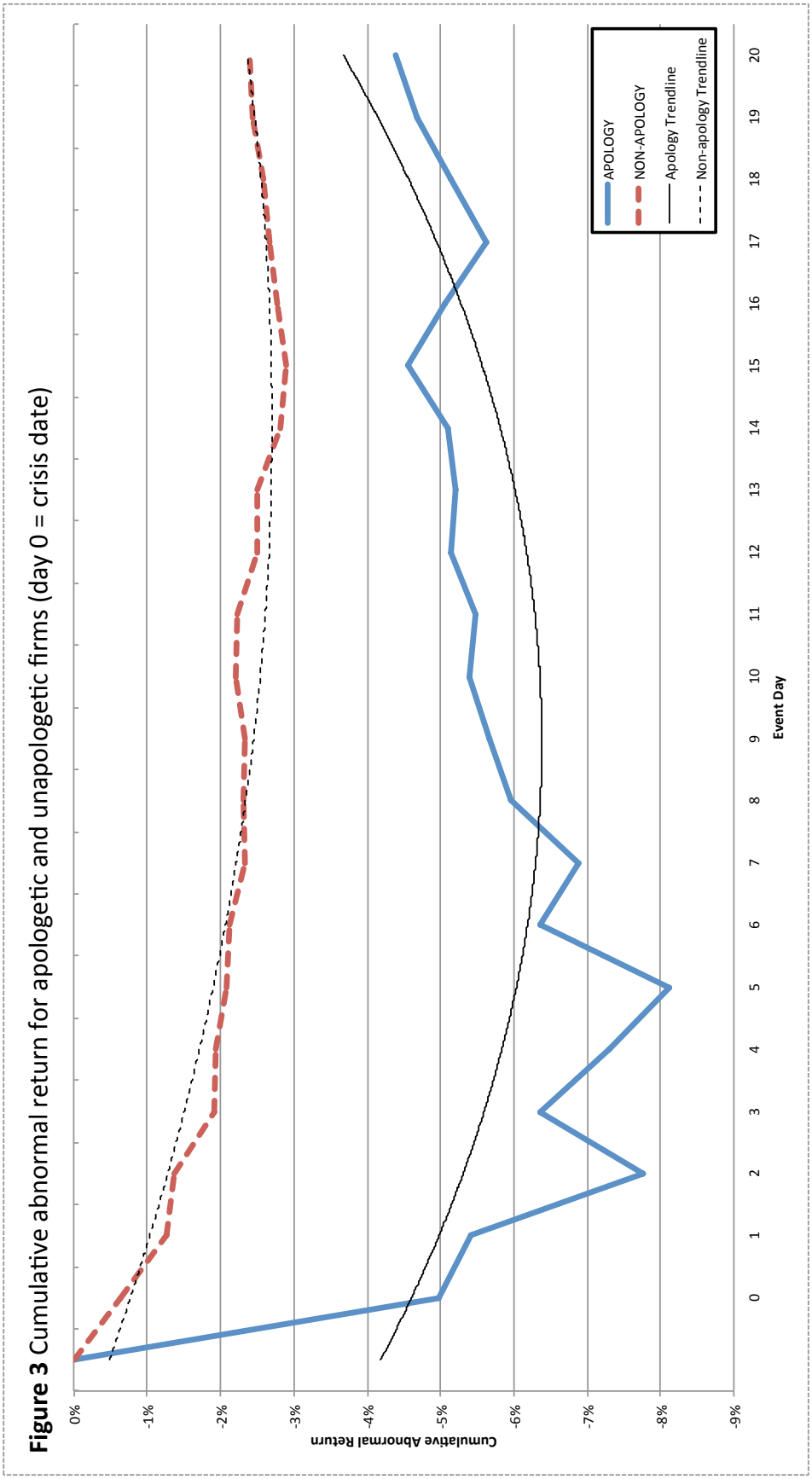


Figure 3 Cumulative abnormal return for apologetic and unapologetic firms (day 0 = crisis date)
0%
-1%
-2%
-3%
-4%
-5%
-6%
-7%
-8%
-9%
Cumulative Abnormal Return
0
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
Event Day
APOLOGY
NON-APOLOGY
Apology Trendline
Non-apology Trendline

Figure 4 The moderating effect of apology on crisis type; event window [0,+10]

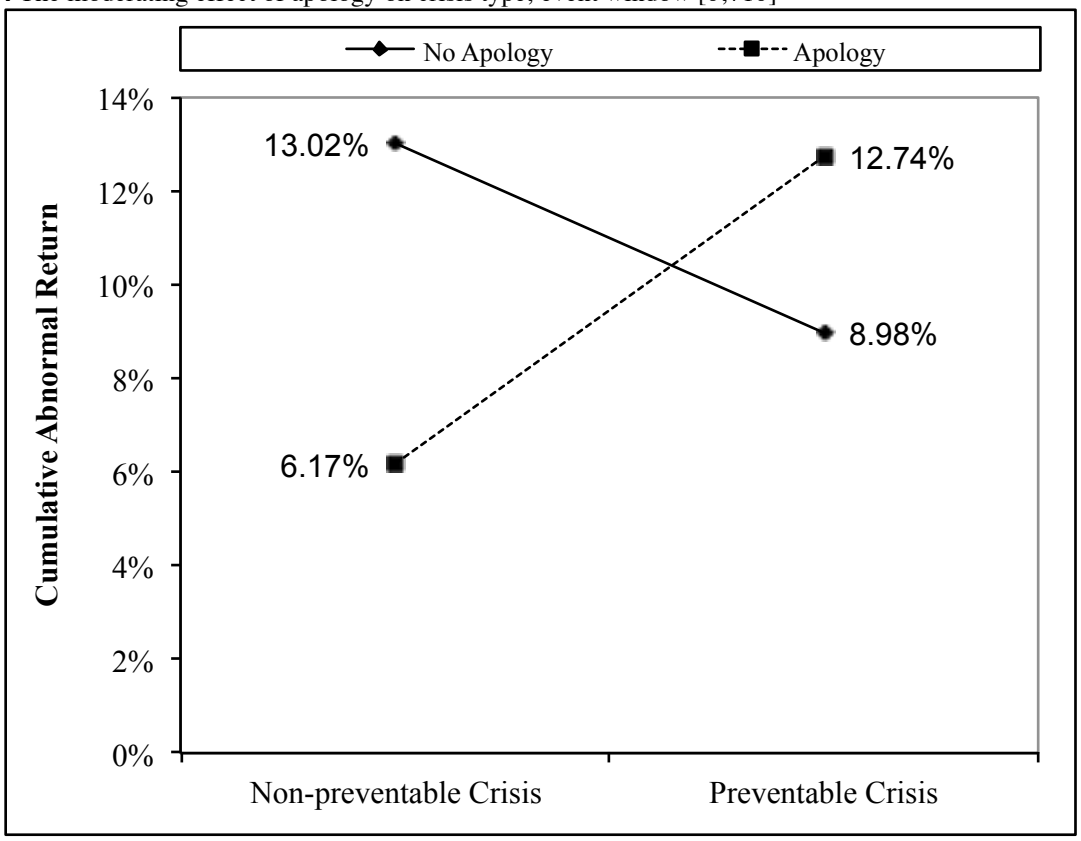
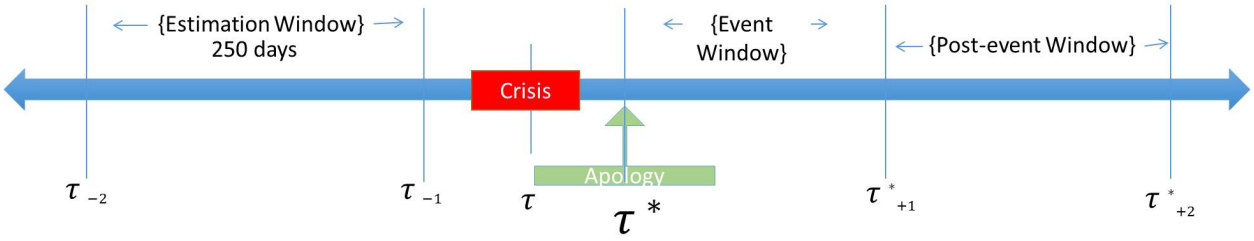


Figure 4 Event study timeline (apology = event)



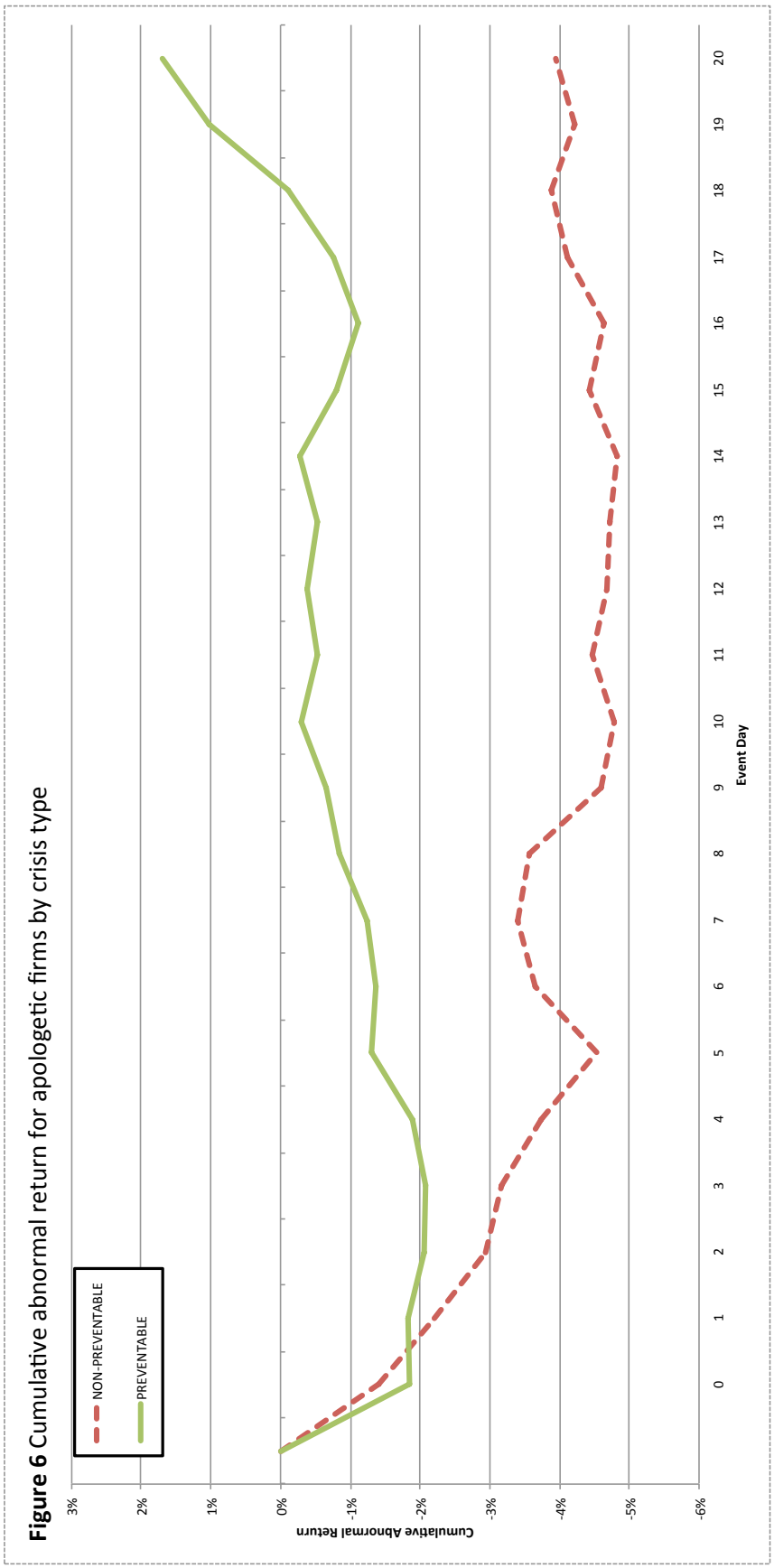


Figure 6 Cumulative abnormal return for apologetic firms by crisis type