SHAREHOLDER VALUE AND CRISIS COMMUNICATION PATTERNS: AN ANANLYSIS OF THE FORD AND FIRESTONE TIRE RECALL

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ABSTRACT

Corporate crises such as product recalls can destroy substantial shareholder value. This paper examines the relationship between stock returns and corporate communication strategies in the 2001 Firestone tire recall crisis related to the Ford Explorer. Taking a multi-disciplinary approach, we classify quotes in published newspaper accounts using Image Restoration Theory (Benoit, 1995) and an accommodative-defensive dichotomy (Marcus & Goodman, 1991). We utilize a cross-sectional event study methodology to analyze the stock market impact of the strategies. Results indicate different communication patterns and illustrate a mixed stock price reaction to the product recall. Ford's image bolstering communication strategy was associated with a more positive stock market reaction, while Firestone tended toward accommodative strategies and struggled with a more negative reaction. Both companies lost significant value during the crisis period, but the results are suggestive that managers can help maintain shareholder value during future corporate crises by utilizing specific communication strategies.

INTRODUCTION

Preparing for and responding to corporate crises has become a fundamental imperative for corporations. Given the globalization of manufacturing and the close monitoring of product quality by consumers, firms, and government agencies, product recalls and their associated negative financial impacts have become nearly inevitable for any manufacturer (Berman, 1999; Dawar & Pillutla, 2000; Bapuji, 2011). Therefore, careful consideration must be paid to crafting corporate strategy following recall events (e.g., Peng & Chen, 2011). The automobile industry is particularly prone to recalls, and the number of recall events is generally increasing in the face of intra-industry competition, faster time-to-market, and additional complexity in supply chain and component procurement (Bates, Holweg, Lewis, & Oliver, 2007). Corporate crises, especially when combined with greater publicity around those crises, can spur or change the strategic management decisions within organizations (Hurley-Hanson & Giannantonio, 2009).

When responding to a crisis, senior management generally emphasizes the goal of maintaining shareholder value. While emphasis is naturally placed on stock price reaction given the traditionally-held imperative to strive for maximal shareholder value, other factors contribute to this value proposition. For instance, managers may prioritize shareholder value as a self-

preservation strategy, insofar as firm financial performance following a crisis is often aligned with personnel compensation schemes, professional reputation, and continued employment.

Effective communication strategies are an important part of a company's ability to respond to and recover from a crisis. The stock market reaction to a crisis is shaped by both the information provided and the signals sent by a corporation's public statements. Crisis periods are characterized by information asymmetry and uncertainty, which combine to bolster the value of effective communication. Therefore, strategic responses to crises have been widely studied in the business management and communication studies literature. An ineffectual communication strategy can result in irreparable damage to a firm's reputation and value, whereas an effective strategy can reduce negative financial outcomes for shareholders and other stakeholders.

This paper evaluates the stock market reaction to the communication strategies employed by Ford Motor Company and Firestone Tire and Rubber Company (now a subsidiary of Bridgestone Corporation) during the tire shredding crisis that took place in the late 1990s and early 2000s. The crisis developed over a substantial period of time and culminated in a mass recall of Firestone tires after the determination was made that tires of some Ford Explorers were prone to tread separation and tire shredding, which led, in severe cases, to vehicle rollovers. Numerous accidents caused injuries and deaths that led not only to the product recall but also a number of lawsuits, governmental and journalistic investigations, and substantial financial losses for both companies.

The present research contributes to the cross-disciplinary literature that links financial valuation metrics with communication strategies. Expanding on the work of Marcus and Goodman (1991), we examine the market's reaction to the different media strategies the companies undertook in response to the crisis. The close spacing of the media statements during the crisis period does not allow for non-overlapping estimation windows as needed in traditional event study analysis; therefore, we employ a cross-sectional event study methodology. Our findings provide an additional perspective on crisis communication best practices.

Specifically, we utilize both Benoit's (1995) Image Restoration Theory and Marcus and Goodman's (1991) accommodating-defensive typology to categorize the public statements of each company during the crisis period. Both companies initially refused responsibility and instead opted for publicly blaming the opposing company. Daniels (2000) summed up the competing stories: "The question is whether the recalled tires cause the rollover (as alleged by Ford), or whether the rollovers are a result of faulty vehicle design with an incorrect pressure recommendation (as alleged by Firestone)" (p. 31). Unlike prior studies of crisis communication that focus on individual case studies, this paper uniquely contributes to the literature by examining the response strategies of two firms embroiled in the same crisis.

To provide context and background for the study, the next section of the paper outlines the sequence of events surrounding the problems that plagued the Ford Explorer and the associated Firestone tires. Then, the relevant literature on corporate crisis communication, product recalls, and the stock market impact of corporate crises is reviewed in order to motivate the research questions of the present study. Subsequently, the data and methodology are presented. Results of the analysis, an associated discussion, and suggestions for future research conclude the paper.

HISTORY OF THE FIRESTONE TIRE RECALL

The crisis at Ford and Firestone is infamous for its severe financial impact on the companies involved (Govindaraj, Lee, & Tinkelman, 2007). The facts of the case are well-documented in the media coverage from the time of the crisis (e.g., Bradsher, 2000; Pearl, 2000; Rutenberg, 2000; Greenwald, 2001; Kepner, 2001; Goodman & Shaffer, 2002), and the recall was considered a top public relations story of 2000 (Statemen, Reese, & Elasser, 2001). Furthermore, the facts of the case have been documented in case studies related to public relations (Moll, 2003), corporate reputation (O'Rourke, 2001), global media strategy (Freitag, 2001), and corporate ethics (Noggle & Palmer, 2005).

Numerous case studies recount the facts of the recall of Firestone tires for the Ford Explorer and the ensuing media coverage of the crisis (e.g., Freitag, 2001; Moll, 2003). The corporate relationship between Ford and Firestone existed since the beginning of the automotive industry; Firestone supplied tires for Ford's Model T, and the story of the friendship between their founders in the early twentieth century is well-documented (e.g., Newton, 1989). The close corporate relationship continued after Firestone was acquired by the Tokyo-based tire company Bridgestone for $2.6 billion in the late 1980s (Hicks, 1988). Most relevant to this paper, Firestone designed and manufactured the tires to be used with the Ford Explorer.

One question raised by the crisis is the culpability of product failure in such a collaborative relationship between the supplier of a component (Firestone) and the final manufacturer of a consumer product (Ford). The tires were manufactured with a suggested inflation pressure of between 30 and 35 pounds per square inch (psi), with a margin of safety as low as 25 psi (Noggle & Palmer, 2005). Ford recommended that tires for the Explorer be inflated only to a pressure of 26 psi ("Ford Pressed on Testing," 2000).

The motivation for the low tire pressure stemmed from the top-heavy nature of the vehicle itself. Increasingly popular in the 1990s, sport utility vehicles (SUVs) like the Ford Explorer were designed to be higher from the ground and narrower to allow off-road navigation. Ford agreed that the Explorer was more prone to rollover than a vehicle more traditionally engineered for city driving (Noggle & Palmer, 2005). The lower tire pressure avoided production delays that would have resulted from re-designing the vehicle to have a wider wheel base or lower center of gravity (Greenwald, 2001; Goodman & Shaffer, 2002). However, the lower tire pressure also increased the amount of friction between the tire and the road, thereby generating additional heat and increasing the likelihood of tire shredding.

The low tire pressure had the additional unintended consequence of lower fuel economy; consequently, Ford approached Firestone for help in making the tires lighter. In 1994, Firestone complied with the request, reducing the weight of the tires by 10% by removing materials from the components (Noggle & Palmer, 2005). Later investigations of the product failures also revealed quality concerns at a manufacturing plant in Decatur, Illinois. Employees were required to inspect as many as 100 tires per hour, resulting in inadequate inspection. Quality was sacrificed for quantity, with extra compensation provided for exceeding production quotas. Furthermore, benzene, a necessary chemical compound for tire manufacturing, was mishandled (O'Rourke, 2001). Whether the eventual problems were caused by low tire pressure, re-engineering of the tire design, production issues, or the vehicle itself is a controversial and open question; likely, all were contributing factors.

The origin of the public crisis was a series of fatal rollover accidents that occurred when the tires shredded at high speed and high temperature. Such incidents were first reported in Saudi Arabia, Qatar, and Kuwait in the mid-1990s. A similar scenario played out in Venezuela, where

46 deaths were related to tires peeling (O'Rourke, 2001). Firestone claimed customer usage was to blame, while Ford argued that without more data further investigation was unnecessary. Firestone was initially hesitant to replace the allegedly defective tires, fearing a potential outcry and resulting financial loss among U.S. consumers. Firestone's engineers also conducted independent tests of the tires in the Middle East and found no defects. Despite the resistance, Ford replaced the tires on all Ford Explorers in non-U.S. markets in 1999 (Pearl, 2000).

Later investigation into the crisis revealed that Firestone had other notice of possible problems. In July 1996, the State of Arizona notified Firestone that the tire treads could separate in hot weather. By 1997, Firestone had received more than 1,500 legal claims for damages, injuries, or death resulting from failed tires (Bradsher, 2000).

Meanwhile, Ford replaced tires in Saudi Arabia, Venezuela, Malaysia, and Thailand in 1999 and 2000, seemingly without much notice in the U.S. market until a Houston news reporter revealed the breadth of the crisis in February 2000. Subsequently, the National Highway Traffic Safety Administration (NHTSA) initiated an investigation in May 2000 (Rutenberg, 2000), and Congressional hearings began in September of that year (Noggle & Palmer, 2005). The height of the public crisis arguably arrived on August 9, 2000, when Firestone voluntarily recalled 6.5 million tires ("Firestone Tires Recalled," 2000). The market reaction to the announcement was a severe decline in the stock price both for Ford, which plunged from $47.50 in August 2000 to $24.59 in June 2001, and for Bridgestone, which declined from $24.75 to $11.00 over the same period. The period from August 2000 to August 2001 was marked by extensive media coverage and numerous press releases and statements from each company. Among the important announcements was the May 21, 2001, notice that Firestone intended to sever its 95-year relationship with Ford. By the end of the crisis, the cumulative loss to Ford and Bridgestone shareholders was approximately $7 and $10 billion, respectively.

Following the initial crisis, various lawsuits, judgments, settlements, and negotiations continued. In 2005, Bridgestone announced that it would pay Ford $240 million to help cover the previously-incurred costs of replacing tires (Watson, 2005). One noteworthy settlement included a Mississippi jury verdict against Ford in the amount of $131 million to the family of Brian Cole, a New York Mets prospect who died in a 2001 rollover incident; Ford agreed to settle the case for an undisclosed payment (Kepner, 2001; McKnight, 2013). Additionally, plaintiffs from four states settled a class action lawsuit against Ford in exchange for various discounts on Ford vehicles for individuals who had owned a Ford Explorer (Associated Press, 2007).

Media coverage of the tire crisis involving Ford and Firestone was driven by the well-known corporate names of the parties involved, the severity of the injuries and deaths, and the number of injured persons around the world. Extensive coverage ensued during the crisis period, and Ford's head of public relations wrote a book chronicling the saga from his perspective and suggested lessons for crisis communication strategies (Harmon, 2009). Naturally, the crisis has been dissected by academic scholars for issues including business ethics (Noggle & Palmer, 2005), supply chain management, strategic management, and crisis communication.

LITERATURE REVIEW

The negative stock market reaction to product recalls is well-established, beginning with Jarrell and Peltzman (1985), who demonstrated significant loss of shareholder value in 26 product recalls in the automotive and pharmaceutical industries. Hoffer, Pruitt, and Reilly (1988) tempered some of those conclusions in their reanalysis and reclassification of the same data. However, studies have continued to find that the stock market reacts quickly and efficiently to

product recall announcements (e.g., Chu, Lin, & Prather, 2005). While many prior studies examined the automobile or pharmaceutical industries due to those industries' relatively large number of significant recalls (e.g., Chen & Nguyen, 2013; Gokhale, Brooks, & Tremblay, 2014), a significant loss in market value has been reported across a range of industries (e.g., Davidson & Worrell, 1992; Ni, Flynn, & Jacobs, 2015).

Given the well-established decline in stock prices following product recalls, previous studies have also sought to identify the particular cause of the lower firm value. Direct costs of the recall are an obvious source of loss, but indirect costs have been shown to be even larger (e.g., Pruitt & Peterson, 1986; Rupp, 2004). The sources of indirect costs include lower earnings forecasts by analysts (Chen & Nguyen, 2013), litigation expense (Copeland, Jackson, & Morgan, 2004), lost future sales (Shin, Richardson, & Soluade, 2012), decreases in margins (Coleman, 2011), damage to the firm's reputation (Rhee & Haunschild, 2006), lost social or reputational capital (Hitt, Lee, & Yucel, 2002), and greater compliance costs due to increased government scrutiny (Dranove & Olsen, 1994). In the specific case of the Firestone tire recall, Govindaraj, Jaggi, & Lin (2004) report that the loss in shareholder value exceeded the direct costs.

In addition to direct and indirect financial costs, assessing a firm's loss in value following a corporate crisis requires a broad, multi-dimensional analysis of its competitive advantage. For instance, Dess and Picken (1999) advocate a process-oriented view of a business and list a number of ways in which firms can build and maintain a competitive advantage, including strategic outsourcing and enhancing relationships with suppliers and customers. From this perspective, it is unsurprising that the principal loss of value during corporate crises overall appears to come from damage to the firm's reputation, relationships, and goodwill. In an experimental setting, strong brands have been shown to suffer greater loss in equity among consumers following a product recall (Korkofingas & Ang, 2011). Previous studies have established the importance and value of social, relational, and human capital (Hitt & Ireland, 2002; Hitt, Lee, & Yucel, 2002) as well as social media relationships (Kim & Ko, 2012).

The value of reputation and brand equity also underlie Davidson and Worrell's (1992) argument that it is better for a firm to withdraw a product from the market entirely than to suffer the ongoing negative publicity of a recall. For similar reasons, more reputable firms can perform better by undertaking a passive crisis management strategy (Chen, Ganesan, & Liu, 2009). In a theoretical model and market simulation, Herbig and Milewicz (1995) demonstrate that credibility and reputation are valuable commodities that can only be built slowly but whose value can easily be destroyed in a short period of time. The importance of reputation and brand value reinforce the importance of multi-disciplinary work to bridge studies of reputation during times of crisis by communication scholars (e.g., Coombs, 2007) and market impact studies.[2]

Since indirect costs and loss of reputation value are significant factors in a firm's loss of value in a product recall crisis, the questions arise of when and how an efficient stock market receives and incorporates information regarding the total costs. Anticipation of a recall or leakage of the news can cause traditional event study methodology to find no significant effect of the recall (Bromiley & Marcus, 1989; Barber & Darrough, 1996). However, abnormal events, unexpected litigation, or unanticipated corporate events do result in significantly negative market impacts on the day of the announcement and the prior day (Chu, Lin, & Prather, 2005). The size of the firm is also a factor in determining and enacting a crisis communication strategy (Cater & Chadwick, 2008). The stock market reaction to expected and unexpected effects will differ. For instance, only one of the four recall events at Toyota resulted in a statistically significant market

reaction (Gokhale, Books, & Tremblay, 2014). One plausible explanation is that the other events were expected due to the ongoing crisis or to information leakage ahead of the announcement.

The present study of Ford and Firestone identifies dates of media reports associated with statistically significant abnormal returns, which suggest the market received important information on those dates. Among the possible unexpected events include announcements of litigation, which Govindaraj, Lee, and Tinkelman (2007) highlight as one reason that the Firestone tire recall stands out as the most statistically significant event in a sample of more than 500 recall events. Furthermore, Govindaraj, Jaggi, and Lin (2004) determined that both Ford and Bridgestone suffered abnormal market fluctuations during the crisis period. Even when the NHTSA cleared Ford of a formal investigation into the safety of the Explorer, the company still faced criticism from financial analysts and hundreds of lawsuits (Moll, 2003).

During a corporate crisis, information asymmetry between the firm's managers and shareholders can be severe. Therefore, the communication strategies and the company's actions can offer important signals to the market regarding current costs and future performance. News articles have been shown to have a larger impact on valuation than even official notification of a recall by automobile manufacturers (Pruitt, Reilly, & Hoffer, 1986) or government crash test data (Hoffer, Pruitt, & Reilly, 1992), and previous studies have employed stock market reaction as the dependent variable when studying announcements of corporate downsizing (Nixon, Hitt, Lee, & Jeong, 2004), product recalls (e.g., Salin & Hooker, 2001), and CEO succession (Friedman & Singh, 1989), in addition to economic or financial variables such as dividends, bond ratings, or unemployment figures. The reaction may be a rational response by investors, because the news media are more likely to cover significant or dangerous recalls (Garber & Bower, 1999). The media effect may help explain the initial overreaction seen in some cases, including the Firestone tire recall (Govindaraj, Jaggi, & Lin, 2004), as well as the excess volatility that Pruitt and Peterson (1986) observed following a recall crisis.

Few prior studies have examined the stock market reaction or measurement of costs in conjunction with theories of crisis communication. A notable exception is Marcus and Goodman (1991), who examined the relationships among communication strategy, crisis type, and stock price reaction. Their framework includes three types of corporate crises: accidents, scandals, and product safety and health incidents. The latter is characterized by a series of events, rather than a one-time occurrence, and is the appropriate category to describe the Firestone tire recall. Their methodology classified statements from a company's spokespeople as either accommodative, in which the company accepts responsibility, admits a problem exists, and takes corrective actions, or defensive, in which the company strives to regain the status quo by denying that problems exist or denying responsibility.

Using signaling and agency theories as the underlying framework, Marcus and Goodman (1991) argued that the stock market reaction depends on both the type of incident and the signals sent by the company's statements. Signaling theory was established in economic and financial theory by Spence (1973, 1974) with application to dividend policy by Bhattacharya (1979); more recent overviews of the theory's widespread applications are provided by Connelly, Certo, Ireland, and Reutzel (2011) and Karasek and Bryant (2012). Corporate communication practices can send important information to the market regarding corporate governance (Zhang & Wiersema, 2009), corporate values (Miller & Triana, 2009), and social responsibility practices (Su, Peng, Tan, & Cheung, 2016), to name just a few.

To understand the stock market reaction to the signals sent by firms during a time of crisis, Macrus and Goodman (1991) employed a traditional event study methodology (Brown &

Warner, 1980, 1985), estimating normal returns with the market model in order to calculate the abnormal stock return on the date that a company communicated through the press. The results imply that defensive communication strategies are best for accidents but that accommodative communication strategies are more appropriate for scandals. In the case of a product safety and health crisis, the effect of communication strategy on excess returns was inconclusive. Since the Firestone tire recall is an example of a product safety and health incident, the market response cannot be predicted.

Two prior studies combined Marcus and Goodman's (1991) accommodating-defensive and Benoit's (1995) crisis communication categories and the resulting stock market reaction for firms in the pharmaceutical industry (Stone, Erickson, & Weber, 2012; Stone, Erickson, & Thorwick, 2015). Both studies supported Marcus and Goodman's expectations for a product recall crisis. The present research adopts a similar methodology in examining the crisis at Ford and Firestone.

Crisis communication lays at the intersection of a range of disciplines, including communication studies, psychology, business management, marketing, and public relations. The overarching goal of crisis communication research is to provide evidence-based guidance on best practices for managers to communicate during a crisis (Laufer & Coombs, 2006; Coombs, 2015). We provide a brief outline of the development of crisis communication[1] and demonstrate the unique nature of the present research endeavor, in which two firms in a supplier-customer relationship attempt to manage the fallout of the same crisis.

One of the most widely-cited typology of crisis communication is Image Restoration Theory (IRT), which Benoit (1995, 1997) formulated by blending earlier communication theories with additional theories from the field of sociology. IRT has been applied to both individuals and corporations; in either case, the accused party is considered responsible for some offensive act so that communication and/or action are required to repair a relationship. Two further assumptions underlie IRT. First, communication is principally a goal-oriented endeavor; second, the primary goal of a corporation during a crisis is repairing and maintaining a positive reputation. IRT also recognizes the dynamic interplay of the corporation, its credibility, perceptions of the intended audience, the crafting of the message, and the ultimate effectiveness of the communication (Benoit, 2000). IRT divides strategies that can be used during a crisis into five categories of communication, which are subdivided into 14 possible strategies.[3] The strategies, along with brief descriptions, are provided in Table 1.

Drawing on a number of corporate case studies, IRT prescribes different strategies based on the circumstances of the crisis (Benoit & Brinson, 1994; Brinson & Benoit, 1996; Benoit & Czerwinski, 1997). Denial is considered the best strategy only when the company is truly blameless. If the company is responsible, then IRT recommends immediate corrective action, coupled with mortification by apologizing, though very few companies follow such a strategy. Instead, a company that cannot convince the public that it bears no responsibility will often select a strategy in the category of evasion of responsibility. Attempting to reduce the offensiveness is generally the next best strategy if the company cannot avoid the crisis (Coombs, 2006). Prior literature emphasizes protecting reputation (Coombs, 2007), reducing the offensiveness of the crisis (Dardis & Haigh, 2009), and preparing for crises with long-term strategic planning (Copeland, Jackson, & Morgan, 2004). A continuum of responsibility acceptance can provide a rank ordering of the communication strategies suggested by IRT.

The two extreme cases of accepting or denying responsibility are analogous to Marcus and Goodman's (1991) framework that divided corporate communication responses into

dichotomous categories: accommodating and defensive. If a corporation admits a problem exists, accepts responsibility, apologizes, and takes action to fix the problem, the strategic response is termed accommodating. By contrast, corporations that deny the existence of a crisis, attempt to alleviate any doubts about the company's future viability, deny any intent, or quickly take action to resume normal operations are considered to enact a defensive communication strategy. The alignment between Benoit's (1995) five main categories and Marcus and Goodman's (1991) binary categories appears in Table 2.

Table 1
COMMUNICATION STRATEGIES OF BENOIT'S (1995) IMAGE RESTORATION THEORY

Categories	Strategy	**Description**
Denial	1. Simple denial	1. Refuting outright that the organization had any part in the event
	2. Shifting the blame	2. Asserting that someone else is responsible
Evasion of responsibility	3. Scapegoating	3. Blaming the event on the provocation of another
	4. Defeasibility	4. Not knowing what to do; lacking knowledge to act properly
	5. Accident	5. Claiming the event was "accidental"
	6. Good intentions	6. Claiming the company had good intentions
Reducing the offensive act	7. Image bolstering	7. Using puffery to build image
	8. Minimization	8. Stating the crisis is not bad
	9. Differentiation	9. Indicating that this crisis is different from more offensive crises
	10. Transcendence	10. Asserting good acts far outweigh the damage of this one crisis
	11. Reducing credibility	11. Maintaining the accuser lacks credibility
	12. Compensation	12. Paying the victim; making restitution to set things to where they were before the event
Taking corrective action	13. Corrective action	13. Taking measures to prevent event from reoccurring
Mortification	14. Mortification	14. Admitting guilt and apologizing

In this paper, we classify corporate strategies based on media reports using Benoit (1995) and Marcus and Goodman's (1991) categories for three reasons. First, they represent the most granular (Benoit, with 14 categories) and the most basic (Marcus & Goodman, with two categories). Second, Benoit's (1995) classifications are the most deeply grounded and widely cited in the crisis communication literature (Ulmer, Seeger, & Sellnow, 2007). Third, these categories have been used in similar literature examining the stock market implications of corporations' communication strategies (Stone, Erickson, & Weber, 2012; Stone, Erickson, & Thorwick, 2015).

Table 2
COMPARISON OF CATEGORIES OF MARCUS & GOODMAN (1991) AND BENOIT (1995)

Marcus and Goodman (1991)'s Corporate Policy Signals	Benoit's (1995) IRT
Accommodating	Corrective Action Mortification
Defensive	Denial Evasion of Responsibility Reducing the Offensiveness

Many prior studies based on communication theories have focused on the reactions of consumers, with relatively little regard to the financial implications of a crisis. An exception is Veil, Liu, Erickson, and Sellnow (2005), who examined a 2003 outbreak of hepatitis A that originated at a Chi-Chi's restaurant and resulted in three deaths. Analysis revealed that financial instability precluded the company from making restitution to the victims. Explicitly linking communication theories and financial outcomes for shareholders is a primary contribution of the present research, joining a handful of papers in this multi-disciplinary approach (e.g., Marcus & Goodman, 1991; Stone, Erickson, & Weber, 2012; Stone, Erickson, & Thorwick, 2015).

An additional benefit of analyzing the Firestone tire recall is the opportunity to observe two firms conducting crisis communication strategies simultaneously in reaction to the same crisis. Broad industry spillovers have been considered in past studies. For example, Millner, Veil, and Sellnow (2011) studied the Peanut Corporation of America's involvement in the peanut butter contamination crisis in 2008. The results imply that it is important for third party (proxy) communicators to step in when the accused organization fails to offer a response to the crisis; failure to do so could tarnish the entire industry. Prior work has also examined crisis communication in maintaining strategic relationships with suppliers and other key accounts (Nätti, Rahkolin, & Saraniemi, 2014) and the reaction of intra-industry competitors (Siomkos, Triantafillidou, Vassilikopoulou, & Tsiamis, 2010). Still, despite a broad and developing literature on crisis communication, to the authors' knowledge no prior work has compared and contrasted the responses from two firms involved in the same crisis. Therefore, this study expands upon previous work by contrasting the media strategies of two firms as they react to the same unfolding crisis.

First, we compare the communication strategies that each firm employed during the crisis. Using Benoit's (1995) categories of communication strategies as well as Marcus and Goodman's (1991) binary classification, we analyze and categorize direct quotes reported in the business press. Since the case study involves statements from both Ford and Firestone during the same crisis period, we are uniquely able to contrast the approaches taken by two companies responding to the same crisis. Second, we measure the stock market reaction to the public statements by both companies. We identify statistically significant abnormal returns using a cross-sectional event study methodology. We analyze the differential effects of the various strategies both by date and by strategy.

DATA AND METHODOLOGY

To conduct this two-firm event study, we first collected all articles published in *The New York Times* and *Wall Street Journal* that included a direct quote from a company employee or spokesperson at either Ford or Firestone. The sample period extended from the first substantial media coverage of the crisis on August 3, 2000, to June 2006, when significant media coverage ended. The research team identified 228 articles for inclusion in the sample, which included 525 direct quotes, 240 by Ford and 285 by Firestone. All of the quotes were coded into the 14 categories of Benoit's (1995) IRT typology and, by implication, simultaneously classified into one of Marcus and Goodman's (1991) accommodating-defensive binary categories. Coders reached consensus for the classification of every quote.

Stock returns for the sample period were obtained from the Center for Research in Security Prices (CRSP). Because Bridgestone's stock is traded on the Tokyo Stock Exchange,

we used price data for the American depositary receipts (ADRs) that trade in the U.S. to avoid the additional complication of the yen-dollar exchange rates.

Comparison Of Corporate Media Strategies

To compare the number of times each company used the various communication strategies, we computed chi-squared tests of homogeneity. The tests were conducted using three different classification schemes. First, we calculated the results considering all 14 sub-categories of Benoit's (1995) IRT. Second, we repeated the analysis after collapsing the counts into IRT's five main categories. Finally, we utilized the Marcus and Goodman (1991) dichotomy of defensive and accommodating in calculating the third test. All three tests analyzed whether Ford and Firestone followed similar patterns of communication strategies during the crisis.

Event Study Methodology

Event study analysis can be used to assess the impact of economy-wide or firm-specific events on the value of a firm (MacKinlay, 1997; McWilliams & Siegel, 1997). Jarrell and Peltzman (1985) were apparently the first researchers to use the method to study the effect of product recalls. In their examination of recall events in the pharmaceutical and automobile industries, they reported significant losses in market value. Govindaraj, Lee, and Tinkleman (2007) examined the use of event study methodology for case studies in the automotive industry and suggest that the methodology is best suited for exploring large, unexpected corporate events. The authors specifically name the Ford-Firestone as an appropriate example. Recommendations for implementing an event study in management research are provided by McWilliams and Siegel (1997). While making necessary adaptations for the small, cross-sectional analysis conducted in this paper, we follow their recommendations throughout.

Event study methodology consists of measuring abnormal returns and testing for statistical significance around a well-specified event. In most cases, analysis is based on the observed trend and volatility of the prior period, which is assumed to represent the normal behavior of the stock (Fama, Fisher, Jensen, & Roll, 1969; Brown & Warner, 1980, 1985; Binder, 1998; Kothari & Warner, 2007). Reliance on the representativeness of a stable estimation window is a vital component of the traditional method.[4] The general methodology has been widely adopted across business research disciplines to examine the impact of events internal or external to the firm; to give an example of each, Asquith and Mullins (1983) examine the impact of dividend initiation while Weiderman and Bacon (2008) report on the impact of Hurricane Katrina on oil the value of oil companies. Marcus and Goodman (1991) applied this traditional method in their study because their research involved multiple firms in non-overlapping periods.

In the present study, this typical event study methodology is not applicable, due to the large number of media statements made by the two firms in a relatively short period of time. News events happen regularly throughout the entire period, such that no stable estimation window can be established for valid prediction of expected returns and volatility during the event window. The repeated event occurrences for each firm contaminate any reasonable estimation window so severely that a normal return cannot be calculated using these methods. Therefore, all statistical testing for this study is conducted with a cross-sectional methodology as described in the remainder of this section.

To measure the impact of each statement on the stock price, we calculate the abnormal return for the day of the statement and the prior day. Generically, the computation of abnormal

returns for each day involves subtracting an expected return from the observed return. For each event *i* at time *t*, we calculate the return for the stock (R_{it}) and subtract the expected return (R_{et}) to find the abnormal return (A_{it}):

$$A_{it} = R_{it} - R_{et} \quad (1)$$

For the firm-specific, univariate tests we also utilize the two day cumulative abnormal return by summing the abnormal return on the day prior to the statement and the abnormal return on the day of the statement:

$$CAR_{it} = A_{i(t-1)} + A_{it} \quad (2)$$

Inclusion of the prior day's returns in the analysis accounts for potential information leakage (Marcus & Goodman, 1991).

The lack of a stable estimation window, however, precludes the use of a market-based model that uses a time series regression as a first step to estimate normal expected returns. Instead, we compute abnormal returns based on the market return model, in which the expected return is simply the average return for a broad market index, and also make comparisons to control portfolios (Brown & Warner, 1980; Armitage, 1995). The control portfolio technique is less common in the event study literature than regression-based methods, but it is appropriate for this study because it allows comparisons to other similar firms, provides easy interpretation of excess return, and obviates the need for a stable estimation period (Henderson, 1990).

We provide results based on the market return model, in which the abnormal return is calculated as the daily stock return less the return on a market index. We used the return on the value-weighted S&P 500 index to represent the daily market return. For robustness, we also calculated value-weighted portfolio returns for hand-curated, industry-specific portfolios. The first set of portfolios consisted of the largest direct competitors for each firm.[5] As a peer group for Ford, the included stocks are General Motors (GM), Toyota (TM), and Fiat-Chrysler (FCAU), while the index for Firestone comprises Goodyear (GT), Michelin (MGDDY), and Continental Ag (CTTAY). An additional pair of portfolios represented the broader industries by using Fama and French's 48-industry classification scheme. Ford was compared to all companies with SIC codes classified as "Automobiles and Trucks" and Firestone's index was similarly associated with "Rubber and Plastic Products."

We follow Marcus and Goodman (1991) by computing tests to determine whether the mean abnormal return for each firm was positive or negative on the event dates. For both firms and for each primary strategy (accommodating and defensive), we test whether the average abnormal return across all statements is non-zero. The one-sample *t*-test and the Wilcoxon signed-rank test are used to compare the mean and the median, respectively.

Due to the nature of the sample, we employ the cross-sectional method (Armitage, 1995; Boehmer, Musumeci, & Poulsen, 1991; Collins & Dent, 1984; Imhoff & Lobo, 1984) for testing the statistical significance of the abnormal return on each release date. To test the significance of the abnormal returns, each event is tested independently in comparison to the cross-sectional pattern of returns on the day of the statement. The standard deviation is based on the abnormal return for each of the *n* stocks in the comparison portfolio, and a standard *t*-test is employed on the date of each press release:

$$\hat{\sigma}_t = \left[\frac{1}{(n-1)}\sum_{i=1}^{n}(A_{it} - \bar{A}_{it})^2\right] \quad (3)$$

$$t = \frac{A_{it}}{\hat{\sigma}_t/\sqrt{n}} \quad (4)$$

The analysis assumes that the distribution of abnormal returns is identical across firms and that no contemporaneous cross-correlations exist (Collins & Dent, 1984). These strong assumptions

cannot be literally true across the entire market. However, our control portfolios also limit the comparison portfolio to stocks in the same industry, which is more likely to approximate these conditions. For robustness, the analysis is repeated using Wilcoxon signed-ranks tests.

RESULTS

Both Ford and Firestone employed a variety of communication strategies in response to the crisis. Table 3 provides detailed results, counting the number of quotes that fall into each of Benoit's (1995) 14 strategies. The five overarching categories of IRT are noted in bold print, and sub-totals are also provided that split the results into Marcus and Goodman's (1991) two corporate policy signals of accommodating and defensive.

Table 3
CATEGORIES OF OBSERVED CORPORATE COMMUNICATION STRATEGIES

	Ford	Firestone
Denial		
Simple denial	27	36
Shifting the blame	13	19
Evasion of responsibility		
Scapegoating	47	61
Defeasibility	15	25
Accident	0	0
Good intentions	6	0
Reducing the offensive act		
Image bolstering	96	69
Minimization	8	4
Differentiation	7	14
Transcendence	0	0
Reducing credibility	13	29
Compensation	0	2
Tacking corrective action	7	12
Mortification	1	14
Accommodating sub-total	8	28
Defensive sub-total	232	257
Grand total	240	285

When considering all 14 categories of IRT, the pattern of strategy use differed between the two firms at a statistically significant level ($\chi^2[13]=37.91$, $p<.001$, $V=.269$).[6] The four categories that made the largest contribution to the difference were image bolstering, mortification, good intentions, and reducing credibility, in that order. Ford employed image bolstering much more than the expected value in the chi-squared test, while Firestone employed it substantially less often. By contrast, Firestone was more likely to utilize mortification, good intentions, and reducing credibility than Ford. Additionally, Firestone used all three of the accommodating strategies (i.e., compensation, corrective action, and mortification) more frequently than expected. From these patterns, we see that Ford focused more on defensive

statements to protect brand and image, while Firestone chose more accommodating statements. Firestone also chose to reduce credibility as a defensive strategy more often than expected.

A chi-squared test was also conducted for the pattern of corporate communication strategies as segmented into the five broader categories of Benoit's (1995) IRT. Again, the usage differs at a statistically significant level ($\chi^2[4]=13.45$, $p=.009$, $V=.160$). The largest contributions to the difference come from Ford's relative overuse of reducing the offensiveness and underuse of mortification. Firestone displays the opposite pattern, underusing the strategy of reducing the offensiveness and overusing mortification. The same conclusion was reached in the third chi-squared test that collapsed all of the statements into the two categories of accommodating and defensive ($\chi^2[1]=8.60$, $p=.003$, $V=.128$). Overall, the observed pattern implies that Ford's statements followed a more defensive strategy than Firestone's more accommodating stance.

The univariate test results upheld previous findings that stock market returns during product safety and health incidents are not sensitive to a firm's choice of defensive or accommodating communication strategies (Marcus & Goodman, 1991; Stone, Erickson, & Weber, 2012; Stone, Erickson, & Thorwick, 2015). The mean one-day abnormal returns on days with accommodating statements were 1.13% for Ford and 0.60% for Firestone using the market model. For days with defensive statements, the numbers were 0.24% and –0.82%, respectively. None of the results differed significantly zero, and the conclusions do not differ for cumulative returns, nor whether the tests are conducted parametrically or nonparametrically.

The stock market reactions to Ford's and Firestone's communication strategies are reported in Tables 4 and 5, respectively. For these tables, the sample is limited to days on which only one strategy was evident in the companies' statements. Days for which the media statements included multiple strategies do not allow for interpretation of the stock market's reaction because it would be unclear which statement the price was reacting to. Therefore, the sample is limited to 145 observations for Ford and 178 for Firestone in these tables.

All of the results are based on the event day only with abnormal returns calculated in relation to the S&P 500 index. We omit the full tables for the cumulative returns and the industry-specific indices for considerations of length and because they do not alter the overall conclusions. The pattern of returns and significance is qualitatively similar in all cases.

The first two columns of Tables 4 and 5 report the raw counts of the number of trading days with positive abnormal return and the total number of observations for each of the IRT strategies. The sign test was used to check for statistical significance, but only the market reaction to corrective action and minimization strategies by Ford were statistically significant. None of the overall positive reactions counts was statistically significant for Firestone. In aggregate, the market's reaction to the strategies was mixed; this finding aligns with Marcus and Goodman (1991) and the results of the univariate *t*-tests reported earlier.

The third and fourth columns of Tables 4 and 5 display the number of days for which the stock market reaction was statistically significant at the 5% level, as measured by the cross-sectional *t*-test of abnormal returns in comparison to the S&P 500 index. The greatest number of positive reactions for Ford occurred when utilizing image bolstering strategies, while simple denial and scapegoating also show a large number of days with positive stock market reaction. Image bolstering also resulted in the largest number of significantly negative price impacts. For Firestone, the largest number of positive reactions took place on days when the company utilized scapegoating and image bolstering. The same strategies also saw large numbers of days with

significant negative reactions along with simple denial.

Table 4
STOCK RETURNS FOR FORD

Strategy	Days with positive reaction	Total observations	Days with significant positive reaction	Days with significant negative reaction	Average daily return	
Accommodating						
Compensation	0	0	0	0	NA	NA
Corrective action	**0	6	0	0	1.02%	5.65%
Mortification	1	1	0	0	0.31%	0.31%
Defensive						
Accident	0	0	0	0	NA	NA
Defeasibility	7	13	1	0	0.72%	5.08%
Differentiation	5	7	1	1	1.42%	-.31%
Good intentions	1	4	0	0	0.06%	-2.28%
Image bolstering	*24	40	8	4	0.93%	12.95%
Minimization	**0	6	0	0	-.86%	-2.35%
Reducing credibility	6	10	0	1	0.64%	-6.20%
Scapegoating	15	26	3	1	0.19%	0.85%
Shifting the blame	5	12	0	1	0.27%	-2.06%
Simple denial	13	20	5	1	1.32%	11.69%
Transcendence	0	0	0	0	NA	NA

*, **, and *** denote statistical significance of the sign test at the 10, 5, and 1% levels, respectively

More important than the raw counts, however, are the average daily and cumulative daily returns, as reported in the final two columns of Tables 4 and 5. The cumulative daily returns are the geometric mean of the daily returns for each strategy. The two greatest cumulative returns for Ford were for days when the company utilized image bolstering and simple denial. These strategies were also among the most commonly used by the firm. In particular, the chi-squared tests identified image bolstering as the strategy Ford used most often in comparison to the expected number of occurrences. Thus, Ford's management apparently identified and enacted a winning strategy during the crisis regarding the goal of maximizing shareholder value.

By contrast, image bolstering and simple denial had starkly negative results for Firestone. Scapegoating, which was the second most common strategy employed by the firm, had a moderately positive impact on stock price. The market's most positive reaction was in response to mortification strategies, which the company did utilize relatively more often according to the chi-squared tests. However, the chi-squared analysis also showed that the company was more likely to use the strategy of reducing credibility, which often led to a substantially negative stock price impact. The management team at Firestone was not as successful in identifying and implementing crisis communication strategies that would enrich shareholders.

Table 5
STOCK RETURNS FOR FIRESTONE

Strategy	Days with positive reaction	Total observations	Days with significant positive reaction	Days with significant negative reaction	Average daily return	Cumulative daily return
Accommodating						
Compensation	1	1	1	0	8.09%	8.09%
Corrective action	5	10	2	3	-1.69%	-16.81%
Mortification	7	9	2	1	2.03%	18.25%
Defensive						
Accident	0	0	0	0	NA	NA
Defeasibility	*8	17	0	0	-0.37%	1.83%
Differentiation	4	9	0	0	-2.24%	-9.31%
Good intentions	0	0	0	0	NA	NA
Image bolstering	**20	39	4	3	-1.63%	-15.04%
Minimization	2	4	0	0	-1.61%	-4.67%
Reducing credibility	9	17	0	1	-1.55%	-16.93%
Scapegoating	**19	35	7	4	8.82%	2.57%
Shifting the blame	7	12	1	0	0.73%	7.43%
Simple denial	*** 9	25	0	4	-2.36%	-13.86%
Transcendence	0	0	0	0	NA	NA

*, **, and *** denote statistical significance of the sign test at the 10, 5, and 1% levels, respectively

We omit reporting of full results for abnormal returns based on the hand-selected index of competitors and the Fama-French industry indices because the pattern of results and interpretation is qualitatively similar. However, the comparisons to these smaller pools of competitors do generally result in a slight increase in statistical significance in the cross-sectional *t*-tests. This evidence is suggestive of a stock market reaction for competitors in the opposite direction from Ford and Firestone. Therefore, the results provide slight evidence in agreement with Govindaraj, Jaggi, and Lin (2004) and Siomkos et al. (2010), who report that competitors benefit during a company's crisis.

DISCUSSION

The problems of the Firestone tire recall and Ford Explorer vehicle incidents caused significant financial loss to the shareholders of both companies. The goals of the present research were to compare the communication strategies of the two firms during the crisis period and to analyze their impacts on their respective stock prices. Overall, our findings align with Marcus and Goodman's (1991) finding that product safety and health incidents do not have a predictable reaction to accommodating and defensive communication strategies. This result strengthens the argument that such crises are among the most challenging for companies to manage and most in need of further predictive research.

The results agree with media commentators who generally argued that Ford practiced a more strategic and effective communication campaign than Firestone (Statemen, Reese, & Elasser, 2001). Ford focused on image bolstering, scapegoating, and denial, all of which resulted in positive stock market reactions, particularly image bolstering. The company apparently practiced this strategy from the beginning, with five quotes related to image bolstering appearing in newspaper articles within one week of the August 3, 2000, beginning of the crisis period.

Though not statistically significant, the stock market reaction to corrective action strategies by the two firms is opposite in its impact. Ford experienced a cumulative 5.65% increase, but the stock price for Firestone fell a cumulative 16.81% in reaction to corrective action. The unique nature of Firestone as a component supplier to the ultimate consumer product manufactured by Ford may have influenced this reaction. By recalling the tires, Firestone admitted that the tires were unsafe so that denial of the problem or other defensive strategies became less tenable (Blaney, Benoit, & Brazeal, 2002). The recall itself may have forced Firestone into a more accommodative stance, which the stock market ultimately rewarded as the best possible strategy. During the recall, Ford could distance itself from the problem by blaming its supplier and focus on image bolstering and denial more successfully. The more direct relationship that Ford enjoyed with its customers was also a likely factor in the reaction to corrective actions taken by the firms.

The reactions of consumers, the media, and the stock market to Firestone's recall were likely also influenced by its prior recall in 1978. Gibson (2000) states that Firestone made several recall mistakes, including a failure to act quickly, to tell the truth, to accept responsibility, to reflect that public safety is paramount, to act voluntarily, and not to scapegoat. Firestone's defensive stance of simple denial was apparently not considered credible, given the facts of the case. The stock price reaction to the crisis at Ford and Firestone reflects a combination of the facts of the case and the companies' chosen communication strategies.

The different strategies employed by Ford and Firestone in response to the crisis may also have been influenced by the cultural difference between the U.S.- and Tokyo-based companies. For instance, Low, Varughese, and Pang (2011) reported that Asian governments were more likely to use mortification, corrective action, denial, and blame shifting, whereas the U.S. government was more likely to use bolstering, defeasibility, corrective action, and attacking the accuser. The results are not directly comparable, because their study examined the response of government rather than corporations. However, the cultural component is one possible confounding factor in the present study.

We also chose to focus on English-language news coverage in U.S. newspapers. Freitag (2001) argues that the Ford-Firestone crisis calls for analysis of global media. While acknowledging this potential limitation, we also note that Bridgestone quickly distanced itself from its Firestone subsidiary during the crisis (Phillips, 2000). Furthermore, Ford stock and the

Bridgestone ADRs both traded on U.S. markets, and the international stock markets would certainly be aware of the English-language media.

FUTURE RESEARCH

The present research examines the efficacy of various communication strategies during a time of crisis. The data comprise direct quotes published in newspapers, but a great deal of corporate communication now takes place on unfiltered social media platforms. The social media presence of firms varies due to a number of influences, including size and the gender of corporate executives (Ratliff & Kunz, 2014), and scholars have analyzed strategic uses of social media for firms (e.g., Kietzmann, Hermkens, McCarthy, & Silvestre, 2011; Veil, Buehner, & Palenchar, 2011). However, the authors are unaware of any studies that combine social media strategy with stock market reaction in an event study methodology; such investigations would provide an important resource for firms instituting communication policies about social media.

Well-managed firms should react to corporate crises by learning and implementing new policies, based on experience. Furthermore, one could hope that some firms in the same industry would also learn and improve their corporate communications in light of the facts analyzed in this paper. Some prior research has revealed that firms unfortunately do not maximize their learning opportunities (McCrea & Betts, 2008). Future research could examine whether firm policies were updated after crisis events as well as whether firms with multiple crises enacted different strategies over time. The automobile industry is a particularly rich dataset for such future investigations. Our research has focused on product recalls as defining specific crisis periods for a firm. This combination of financial event study methodology with strategic communication could be extended to other corporate events. Marcus and Goodman (1991) identify the three categories of accidents, product safety and health incidents, and scandals, each of which could be examined using a similar methodology. Another possibility is to examine the impact of positive announcements or communication campaigns, such as communicating about a firm's commitment to corporate social responsibility (Yang, Colvin, & Wong, 2013). Finally, comparing the market reaction to positive and negative events would be another avenue for future research projects.

CONCLUSION

This paper examined both the pattern of media strategies and the resulting stock market reaction to direct quotes from Ford and Firestone during their product recall crisis period, beginning in 2000. Direct quotes from company spokespeople were coded according to the crisis communication categories of IRT (Benoit, 1995) and the dichotomy of accommodative and defensive (Marcus & Goodman, 1991). The paper is unique in contrasting the communication strategies of two companies as they responded to the same crisis. The results show that the firms differed in their chosen strategies, with Ford emphasizing image bolstering with less emphasis on mortification, good intentions, or reducing credibility. The opposite pattern was observed for Firestone. While both companies suffered significant losses in market capitalization as a result of the crisis, Ford's more aggressive actions reflected a more successful media campaign.

In analysis of the stock market reaction, we employed a cross-sectional methodology to test for abnormal returns in comparison to daily fluctuations in the stock market and industry

indices. By taking a multi-disciplinary approach, this paper contributes to a growing literature in crisis communication, which naturally draws on theories of communication, public relations, management, and finance.

ENDNOTES

1 Coombs (2006) provides a useful survey of the literature related to communication responses to corporate crises.

2 Corporate strategy can also be assessed in the context of institutions, as distinguished from the industry-based or resource-based views (Peng, Sun, Pinkham, & Chen, 2009). While the broader environment certainly does have an impact on firm strategy and value, the present research focuses on the specific firm responses to a product recall. Measuring stock market reaction implies a shorter term focus than would be appropriate for the broader, long-run institution-based perspective.

3 Brinson and Benoit (1999) proposed a new strategy, called *separation*, which is a variation on shifting the blame. We employ the classic list of 14 strategies in this research.

4 Alternative models (Boehmer, Musumeci, & Poulsen, 1991) and single-firm event studies (Gelbach, Helland, & Klick, 2013) similarly rely on the stability of the distribution of abnormal returns during the estimation window.

5 These portfolios are similar to the automobile index employed by Rupp (2004).

6 The χ^2-test for homogeneity can be sensitive to cells with fewer than 5 observations (Mellinger & Hanson, 2016). For robustness, we calculated the test statistic in two additional ways: eliminating categories that either firm employed fewer than 5 times and applying Yates's correction. The results remained statistically significant at the 1% level and did not alter our conclusions nor interpretation.

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