

Corporate Social Media: How Two-Way Disclosure Channels Influence Investors

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**Abstract**

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I examine how a firm's engagement with individuals on social media affects the firm's reputation and its attractiveness as an investment. I focus on a case in which a Twitter user criticizes an application of managerial judgment in a firm's financial disclosure and firm management chooses whether and how to respond. I collect data using two experiments in which I vary the number of retweets the criticism accumulates and the firm's response strategy. Results of my experiments suggest the following. First, a third-party criticism, even one that is unfounded, can cause investors to question their positive reactions to a firm's disclosure (relative to never viewing the criticism). Second, a firm's reputation and attractiveness as an investment further depend on the number of retweets the criticism accumulates. Third, following a third-party criticism, managers can use Twitter to repair investors' perceptions by addressing the criticism directly *or* by redirecting attention to more positive highlights from the firm disclosure (relative to not responding). Overall, my study advances our understanding of how a firm can effectively manage investors' perceptions by participating in, rather than abstaining from, conversations about the firm on social media.

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I dedicate this dissertation to my husband, Joe Gleason, who likes it more than I do.

## I. INTRODUCTION

The Securities and Exchange Commission (SEC) recently authorized firms to disclose financial information via social media provided investors are told in advance that the medium may be used for such disclosures (SEC 2013, 2014). Although the presence and prominence of information intermediaries such as institutional investors and professional analysts have been linked to firms with more informative disclosure practices—suggesting that these parties have likely always had some ability to “pull” disclosure from firm management (Healy and Palepu 2001; Lang and Lundholm 1996)—social media gives a voice to investors and analysts with no formal direct line to management. Now, individual investors have a public forum to pose direct questions and interact with each other in ways that place pressure on managers to take action. As a result, a truer two-way “push and pull” model of firm-investor communication has emerged.

In response to the SEC’s recent guidance and the threat that unfiltered and uncontrolled public conversations pose to corporate reputations (Investis 2015), more companies are piloting various social media strategies in an effort to develop best practices (Joyce 2013). Motivated by this phenomenon, I investigate (1) how various social media strategies employed in response to negative attention influence a firm’s reputation and its attractiveness as an investment, and (2) whether the number of times a single third-party criticism has been reposted, which affects its perceived consensus, alters how investors respond to these strategies.<sup>1,2</sup>

Investigating the implications of corporate social media strategies is important in light of recent empirical evidence demonstrating the relevance of social media activity for security prices (Curtis, Richardson, and Schmardebeck 2016; Lee, Hutton, and Shu 2015), returns (Chen,

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<sup>1</sup> In line with Ponzi, Fombrun, and Gardberg (2011), I adopt an emotion-based conceptualization of corporate reputation. Specifically, “corporate reputations are beliefs about companies’ past and future actions that shape how stakeholders interact with them” (Ponzi et al. 2011, 30).

<sup>2</sup> I conceptualize investment attractiveness as the desirability of a corporation’s common stock (as an investment).

Hwang, and Liu 2016; Chen, De, Hu, and Hwang 2014), and information asymmetry (Blankespoor, Miller, and White 2014; Jung, Naughton, Tahoun, and Wang 2015; Saxton and Anker 2013). I focus on reputation because public relations agencies have expressed concerns about the risk that social media poses to corporate reputations (e.g., Accenture 2014; BRANDfog 2014; Investis 2015) and because there is considerable empirical evidence linking reputational capital to firm value (Chakravarthy, deHaan, and Rajgopal 2014; Karpoff, Lee, and Martin 2008; Karpoff 2011; Murphy, Shrieves, and Tibbs 2009; Palmrose, Richardson, and Scholz 2004). Indeed, managers appreciate that reputational damage has capital market consequences. In two separate surveys, 87 percent of surveyed executives and the majority of 1,418 risk decision-makers recently labeled reputation risk as *the* top strategic business risk (Deloitte 2014; Aon Risk Solutions 2015). Firm managers could benefit from a better understanding of the consequences of different social media strategies considering that “most companies’ corporate communications teams now accept that they need to be on social media—but many of these companies are still not confident or adept at using it” (Investis 2015, 6).

In this paper, I focus on the receipt of negative attention on Twitter.com (Appendix A provides an example). I rely on firms’ current use of Twitter and recommendations from prior literature to select three strategies to test, which I call No Response, Explanation, and Redirection. The No Response Strategy, in which management chooses to take no action, can be directly compared to the two more active strategies, Explanation and Redirection. Whereas Explanation involves management providing a plausible reason for why the negative attention is undeserved, Redirection involves management redirecting investors’ attention to more favorable elements of its disclosure. To better understand the relation between a firm’s Twitter strategy and investors’ perceptions, I investigate the effects of these strategies at two levels of support for the

negative attention by manipulating the number of times a third-party criticism has been reposted and forwarded to additional users (i.e., has been “retweeted”).

I collect data using a  $2 \times 3$  (number of retweets  $\times$  firm Twitter strategy) plus one (control) between-participants experiment. Participants assume the role of an investor in a hypothetical firm and follow the relevant Twitter activity for its current quarter earnings announcement. To establish the firm’s presence on Twitter, the first tweet participants view is from the firm itself, pointing investors to its quarterly earnings press release. Next, participants view a tweet from an unfamiliar source, which highlights a large change in one of the firm’s discretionary accrual accounts and cites this change as the reason for the firm’s positive earnings event. I manipulate (1) the criticism’s perceived consensus via the retweet count on the face of the tweet (operationally, this count signifies that the tweet has been retweeted one or 126 times) and (2) the firm’s chosen response strategy (No Response vs. Explanation vs. Redirection) to form six treatment conditions. Participants in the control condition receive the firm’s earnings news via Twitter but never view the criticism or the firm’s response (or non-response). After working through the case materials, participants make a series of investment-related judgments.

Using the experimental method allows me to measure investors’ perceptions directly and independently (as opposed to proxying for “net perceptions” with observed price changes, for example) and to provide *ex ante* evidence concerning the implications of a strategy not yet commonly employed on Twitter—Explanation (Investis 2015; NIRI 2013). In addition, I hold constant factors that prior research demonstrates to be important for investors’ perceptions (e.g., management’s incentives, disclosure characteristics, etc.). In doing so, I isolate the effects of retweet count and firm Twitter strategy and circumvent the self-selection issue that is present when evaluating evidence on real-world firms’ social media strategies.

Given prior research demonstrating individuals' tendency to use consensus as a cue for correctness (e.g., Chaiken, Giner-Sorolla, and Chen 1996), I expect investors to use the number of retweets a third-party criticism accumulates as a cue for the criticism's validity. As a result, the influence a firm-focused criticism has on investors' perceptions should intensify with the number of retweets it accumulates. The results of my experiment support this theory. Participants indicated that firm reputation and investment attractiveness were damaged when the third-party criticism had been retweeted many times, but not when it had been retweeted few times. This result suggests that accumulating retweets is one way to add credibility to a tweeted message.

Attribution theory describes the process by which individuals identify the causes of an observed behavior or event (Heider 1958; Kelley 1967) and guides my predictions concerning a firm's Twitter strategy. Because I expect a criticism from an unfamiliar third party to damage investors' perceptions of a firm when that criticism has been retweeted many (but not few) times, I expect reputation-repairing actions are more beneficial when that criticism has been retweeted many (relative to few) times. For example, management should be able to mitigate reputational damage by actively attempting to override investors' original attributions about the firm. Thus, I predict that providing an explanation in response to a third-party criticism should result in more positive perceptions of the firm relative to not responding, and this effect should be most pronounced when the criticism has accumulated a meaningful number of retweets.<sup>3</sup> Results of my experiment support this *Retweets* × *Strategy (Explanation vs. No Response)* interaction.

As an alternative to addressing the criticism directly, management could try redirecting investors' attention to more positive highlights from its disclosure. As this strategy effectively

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<sup>3</sup> Although the potential benefits of providing an explanation in response to a criticism are relatively clear-cut, investors may not view Twitter as the appropriate platform for firms to engage in this manner. For example, investors could dismiss the firm's tweet completely or hold it against the firm, causing further harm to firm reputation as a result. Whether the benefits of providing an explanation outweigh the risk of being perceived as violating corporate tweeting norms is an empirical question—one I attempt to inform with this study.

ignores the Twitter universe's demand for further explanation, I expect investors' initial attributions concerning the firm to be solidified. Contrary to my expectations, results suggest that using Twitter to make the firm's good news salient again *also* appears to be a useful tool for managing investors' perceptions of a firm. There are several reasons why redirecting attention could prove effective. For example, firms that currently sustain a Twitter presence often engage in what appears to be Redirection; thus, *some* managers must believe that engaging in this manner carries some benefit. In addition, because tweets are 140 characters or fewer, Twitter is designed for quick retrieval and dismissal of information (i.e., Twitter caters to a short attention span); thus, refocusing Twitter users' attention away from the criticism and toward something more positive could be all it takes to unwind investors' initial reactions. To better understand this conjecture, I conduct a follow-up three-celled experiment in which I hold constant the criticism's retweet count at many, vary the source of the redirective tweet (firm vs. news source), and compare both redirectives to the No Response Strategy. Results of this second experiment again support the notion that redirecting attention has benefits. Moreover, the success of the redirective does not appear to depend on which credible source the tweet is from (firm or news source).

Supplemental analyses reveal several additional findings. First, results of a structural equations model are consistent with the theory that a criticism's retweet count and a firm's Twitter strategy affect a firm's attractiveness as an investment *through* their effects on firm reputation. Second, participants in the control condition report having significantly more positive perceptions of the firm than participants in any given treatment condition. This finding suggests that (1) a criticism, itself, can make investors question the positive feelings about a firm caused by a positive earnings announcement, and (2) even successfully managing investors' perceptions *ex post* may not restore investors to the positive state they would have had, had the criticism

never been viewed in the first place. Third, although both active strategies appear similar with respect to managing overall perceptions of the firm, participants report being more likely to support (i.e., “like”) and further disseminate (i.e., retweet) the explanation than the redirective.

As individuals continue to increase their reliance on social media for firm-level news and investment advice, firms that fail to participate in the conversation are likely to be noticed for their silence (e.g., Apple, Facebook, and Google (PR Newswire 2015)). In adapting corporate disclosure practices to an information environment that embraces social media (see Kaplan and Haenlein (2010) for a detailed discussion and Miller and Skinner (2015) for a more recent commentary), it would be helpful for managers to know more about how investors react to different corporate uses of social media. By investigating the implications of public stakeholder-firm interactions for a firm’s reputation and its attractiveness as an investment, I aim to assist firm managers in their development of social media best practices. In doing so, my study complements and extends the large literature investigating firms’ disclosure choices and the growing literature exploring the relevance of new media for investors’ perceptions and behavior.

## II. BACKGROUND AND HYPOTHESIS DEVELOPMENT

### What’s all the [#Hype](#) about [#SocialMedia](#)?

Social media websites and applications such as Facebook, LinkedIn, Twitter, and YouTube make it possible for anyone with access to the Internet to publicly broadcast her opinions (e.g., of a firm), predictions of future events (e.g., stock price changes), or past or potential decisions (e.g., trading activity). That is, in addition to facilitating information *dissemination*, social media provides capital market participants an opportunity to publicize how they *process* information. On the social media website Twitter.com, for example, a user identified by her username “@user123” can publish these opinions, predictions, and decisions in

a post of 140 characters or fewer called a “tweet.” Each tweet is then publicly accessible via Twitter’s search function and shared immediately with the tweeter’s “followers,”—other users who have opted-in to receiving all of her tweets. In short, the evidence suggests that social media “provide a meaningful platform for people to help each other make more informed investment decisions” (Chen et al. 2014, 1386).

Social media platforms have several characteristics that create a “richer” disclosure channel (Daft and Lengel 1984, 1986) relative to more traditional media.<sup>4</sup> First, social media promote public and uncensored *two*-way communication—both among stakeholders and between stakeholders and firms. Second, posts on social media can be made in real-time, allowing for rapid commentary and discussion on live events (e.g., firm disclosures). Third, the practice of including “hashtags” in posts and “cashtags” in tweets provides interested users easy access to all posts related to a specific topic or publicly traded company, respectively.<sup>5</sup> In addition to Twitter users’ exclusive use of cashtags, they can also, by default, view others’ shared content without preapproval. That is, tweets are capable of reaching large audiences, both inside and *outside* of a tweeter’s network. Together, these features make social media platforms in general, and Twitter in particular, ripe for influencing others’ perceptions of a firm in new and unexplored ways (Miller and Skinner 2015; Saxton 2012).

In addition to individuals (e.g., [@ElonMusk](#), 3.98M followers, and [@Nicole\\_Cade](#), 33 followers), many traditional news outlets and other businesses create Twitter accounts that bear their organization’s name (e.g., [@CNN](#), 25.3M followers, and [@Starbucks](#), 11.7M followers).

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<sup>4</sup> A communication medium’s “richness” is increasing in its capacity to facilitate shared meaning. For example, “face-to-face is the richest medium because it has the capacity for direct experience, multiple information cues, immediate feedback, and personal focus” (Lengel and Daft 1988, 226).

<sup>5</sup> Within the text of their messages, Twitter users place a hashtag (“#”) before relevant keywords or topics and the dollar sign (“\$”) before ticker symbols to help categorize posts and make them accessible to others interested in a particular subject (e.g., [#Investing](#), [#AccountingRocks](#), [\\$AMZN](#), and [\\$SBUX](#)). Hashtagged words and cashtagged tickers become hyperlinks that, when clicked, redirect the interested party to all other posts with the same tag.

Businesses often use Twitter to connect with customers, advertise sales, and present or discuss financial performance.<sup>6</sup> Consistent with a growing appreciation for the relevance of Twitter for investors' perceptions and behavior, by July 2013, 47 percent of S&P 1500 firms had a Twitter account and 57 percent of these firms had a track record of tweeting information related to quarterly earnings news (Jung et al. 2015). By Q3 2014, 84 percent of sampled U.S. firms had a corporate Twitter account and, in a global sample, 70 percent of firms with corporate accounts had a history of tweeting investor relations content (Investis 2015).<sup>7</sup>

Despite this growth, many firms have yet to formalize a strategy for mitigating potential adverse effects (NIRI 2013). Instead, firms' tweets regarding earnings announcements often direct viewers to company websites or press releases. When firm tweets contain unique content, they frequently highlight points from a press release or share direct quotes from a firm's earnings conference call. An example of a more innovative use of Twitter for investor relations purposes is Ford Motor Company's presence on StockTwits.com, a website dedicated to financially oriented tweets. Ford's Chief Financial Officer, Robert Shanks (via [@Ford](#), 886K followers), has conducted question and answer sessions with the broader investor community using StockTwits.com following at least six of Ford's recent quarterly earnings releases.<sup>8</sup> Firm managers are likely to refine their social media strategies as they learn more about how investors receive Ford's and other firms' two-way disclosure practices on Twitter.

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<sup>6</sup> Company Twitter strategies vary considerably. Whereas some companies use Twitter strictly to gather data on consumer sentiment, for example, others have teams of employees who spend their working hours responding directly to tweets of stakeholders (e.g., [@ChipotleTweets](#), 772K followers, and [@United](#), 805K followers).

<sup>7</sup> The Investis (2015) review includes all companies in the Dow Jones Industrial Average, S&P 100, NYSE US 100, NASDAQ 100, FTSE 100, and FTSE 250.

<sup>8</sup> Although Ford is currently the only major company that has facilitated a complete question and answer session on StockTwits.com to date, many companies use Twitter to solicit questions from the broader investment community and then reference a selection of these questions on their conference calls (e.g., [@FedEx](#), 234K followers, and [@GeneralMills](#), 64.4K followers). More widespread adoption of these practices seems likely in light of recent research documenting the capital market benefits of offering a direct line to management via investor relations activities generally (Bushee and Miller 2012) and social media specifically (Elliott, Grant, and Hodge 2015).

## Related Research

Prior research investigating social media activity and its association with capital market activity suggests that content posted on social media platforms can impact stock prices, returns, liquidity, and information asymmetry. Regarding *investors'* use of social media—Curtis et al. (2016) find that abnormally high levels of firm-focused social media chatter are associated with stronger and more accurate market reactions to earnings surprises, on average. Further, Chen et al. (2014) and Saxton and Anker (2013) find that blog posts help predict future returns and earnings surprises and help reduce the information asymmetry that exists between corporate insiders and investors, respectively. These findings highlight the growing importance of nonprofessional analysts and investors for firms' information environments. Regarding *firms'* use of social media—Chen et al. (2016) find that the tweets of firm executives help predict abnormal stock performance, and, relying on a sample of technology firms, Blankespoor et al. (2014) document that using Twitter as an additional channel to disseminate corporate news can reduce a firm's bid-ask spread and increase the number of shares available at each price.

Most closely related to my study, Lee et al. (2015) use archival data to document (1) an association between the frequency of outsider tweets around a product recall announcement and the related negative stock price reaction, and (2) an association between the frequency of tweets from the firm and the attenuation of this negative reaction. My study complements Lee et al. (2015) in that I experimentally manipulate a firm's response strategy in order to draw inferences about the effects of *how* a firm chooses to handle negative attention on Twitter. In contrast, Lee et al. (2015) treat all firm posts as interchangeable, thereby restricting their inferences to the effects of how *much* a firm tweets. In addition, although both Lee et al. (2015) and I present theory to suggest that the path between posts on social media and stock price assessments is via

perceptions of firm reputation, only the experimental method allows for the empirical identification of this path (i.e., by measuring these perceptions directly).

### **The Social Science of Social Media: a Role for Retweets**

Given the evidence collected to date, it is reasonable to assume that information shared about a firm via social media can impact investors' perceptions and behavior much like information shared about a firm via more traditional channels. Further, if accumulating retweets is one way to enhance the perceived validity of a tweeted message, then the greater the number of retweets, the bigger the impact on investors' perceptions and behavior. I expect this retweet/perceived validity relation exists given (a) survey evidence that suggests one of the most common motivations for retweeting is to "show agreement" (boyd, Golder, and Lotan 2010; Recuero, Araujo, and Zago 2011) and (b) heuristic processing models that suggest individuals perceive consensus as a cue for correctness (Chaiken et al. 1996; Cialdini and Goldstein 2004; Eagly and Chaiken 1993).<sup>9</sup> In a corporate disclosure setting, if investors view a criticism with few (many) retweets as being lower (higher) in consensus, then the damage to a firm's reputation should be increasing in the number of retweets a firm-directed criticism accumulates.<sup>10</sup>

Moreover, prior research suggests that investors rely on affect-based inputs when making investment decisions—that is, investors do not base their decisions solely on expected returns and risk (e.g., MacGregor, Slovic, Dreman, and Berry 2000). For instance, Aspara and Tikkanen

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<sup>9</sup> I argue that investors are likely to view the number of retweets as a *cue* for the tweet content's validity. My argument does not depend on whether the number of retweets *actually* correlates with the accuracy of the tweet's content. Whereas recent research studying the spread of misinformation on Twitter provides examples where this retweet/accuracy relation does not hold (e.g., Starbird, Maddock, Orand, Achterman, and Mason 2014), whether this retweet/accuracy relation holds, on average, remains an outstanding empirical question—the answer to which would help inform whether investors' use of retweets as a cue for correctness is a rational practice.

<sup>10</sup> In a pilot study, I confirm that accumulating retweets significantly enhances the perceived consensus of a tweet in a corporate disclosure setting. Specifically, pilot participants who viewed a criticism with at least 36 retweets indicated greater agreement with the statement "there appears to be agreement among Twitter users that [the third party] brought up a valid criticism regarding [the firm's] quarterly performance" than participants who viewed the same criticism with no retweets (e.g., 36 vs. 0 retweets;  $t = 8.73$ ;  $p < 0.01$ , untabulated). On a date after this pilot study, I chose to focus on few (not zero) vs. many retweets to avoid *also* manipulating whether or not a post had been retweeted at all (while still operationalizing low vs. high consensus).

(2010, 2011) and Su, Chang, and Chuang (2010) find that individuals rely on their perceptions of corporate reputation when assessing their willingness to invest in a particular firm. Given this relation and my expectation that investors perceive a firm to be less reputable as the number of times a criticism gets retweeted increases, I formalize the following hypothesis:

**H1:** A third-party criticism with many retweets causes greater harm to a firm's attractiveness as an investment than a third-party criticism with few retweets.

### **Participating in the Conversation: Engaging with Individuals on Twitter**

Prior literature in psychology, management, and accounting suggests that open communication and helping individuals make sense of negative events can temper the adverse effects of these events (Elliott, Hodge, and Sedor 2012; Korsgaard, Brodt, and Whitener 2002; Whitener, Brodt, Korsgaard, and Werner 1998). Relying on this research and on attribution theory (Heider 1958; Kelley 1967), I expect that when a third-party criticism damages perceptions of a firm, the firm can regain investor confidence by addressing the criticism directly. Specifically, a plausible explanation for why the criticism is undeserved can shift investors' attributions for the criticism away from the firm's disposition (e.g., management is untrustworthy) and towards the situation (e.g., the critic must have an ulterior motive).<sup>11</sup> As investors let go of perceived dispositional causes, firm reputation should be repaired.

Attribution theory further suggests that the implications of a firm's response to a criticism made on Twitter should depend on the initial criticism's retweet count. For instance, when a firm provides an explanation to a criticism that is low in consensus (a relatively weak demand for further disclosure), the strength of the effect (the explanation) will appear dissimilar to the strength of the only apparent cause (the third-party criticism). Because a matching of cause and

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<sup>11</sup> The extent to which management's explanation positively alters investors' perceptions should depend on the explanation's plausibility (as documented by Barton and Mercer (2005)). Although fixing the plausibility of my experimental firm's explanation at a relatively high level should help to uncover an effect of the Explanation Strategy if it exists, it also limits the generalizability of my findings to explanations that investors deem plausible.

effect strength is a useful cue in identifying a causal relation (Einhorn and Hogarth 1986), this mismatch will cause interested investors to search for an alternative explanation for the firm's tweet. Investors could then attribute the firm's provision of an explanation to (1) the underlying seriousness of the criticized action, (2) management's incompetence at reading the situation, or (3) firm management's openness and willingness to take even small investors' questions seriously. Whereas the former two attributions could harm investors' perceptions of the firm, the latter attribution could have a positive impact. These and other attributions are likely to be randomly distributed across participants and thus the net (on average) effect is likely to be small. Together, I predict that a criticism's retweet count and the Explanation Strategy will interact.

**H2:** Providing an explanation for a criticism (i) rebuilds a firm's attractiveness as an investment when the criticism has been retweeted many times, but (ii) has little effect when the criticism has been retweeted few times.

Turning to the Redirection Strategy. When a firm ignores the Twitter universe's demand for further explanation (as in the case of a criticism high in consensus), instead attempting to redirect attention, investors' initial attributions concerning the firm could be solidified. This argument is parallel to the evidence presented by Ferrin, Kim, Cooper, and Dirks (2007), which suggests that any failure to address guilt will be ineffective in repairing trust after a trust violation. Because a failure to address a criticism is more salient when a firm actively attempts to redirect attention than when the firm simply takes no action, I expect that saying something but explaining nothing will leave firms worse off than saying nothing at all. This expectation is in line with the results of Hollander, Pronk, and Roelofsen (2010), who find that investors tend to interpret a manager's choice to avoid directly answering a question raised on an earnings conference call as bad news.

Conversely, because a criticism is unlikely to cause real harm to firm reputation when it is low in consensus, onlookers should not consider it unusual for a firm to ignore such a

criticism. As a result, investors should not view Redirection as negatively as I expect when the criticism is high in consensus. Instead, it is possible that redirecting attention to favorable information could serve to endorse the firm. Together, I predict that a criticism's retweet count and the Redirection Strategy will interact.

**H3:** Redirecting attention away from a criticism (i) causes further harm to a firm's attractiveness as an investment when the criticism has been retweeted many times, but (ii) has little effect when the criticism has been retweeted few times.

All predictions are summarized in Figure 1.

< FIGURE 1 >

### III. EXPERIMENTAL DESIGN AND METHOD

#### Participants

Five hundred fifty-eight U.S. workers from Amazon.com's Mechanical Turk (MTurk) online marketplace completed my study.<sup>12</sup> Before viewing the research instrument, potential participants were asked if they had previously invested in the stock market and if they had previously read a financial statement. Individuals who answered "No" to either of these questions were politely dismissed and unable to regain access to the study. On average, qualifying participants were 35 years old, had between nine and twelve years of full-time work experience, and had taken 1.5 accounting and 1.5 finance courses.<sup>13</sup>

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<sup>12</sup> To confirm the replicability of my findings and to increase the power of my statistical tests, 279 MTurk workers participated in each of two separate data collection sessions spaced one year apart. I included an additional screen in the second session to ensure that no single individual was able to participate in both sessions. These two sessions produce sample participants and results that are qualitatively similar. In addition, neither data collection date nor its interaction with my independent factors (or their interaction) are significant when entered as covariates into reported analyses. Because there are no notable differences, I present all summary statistics and analyses after pooling across collection dates.

<sup>13</sup> Participants reported that they use Twitter almost weekly and are very familiar with its functionality, on average. Neither how frequently an individual uses Twitter nor her familiarity with Twitter appear to matter with respect to my dependent measures (all *p*-values are not significant when entered as covariates into reported analyses). In addition, all tabulated analyses are robust to the inclusion of all available demographic characteristics as covariates.

For the purpose of investigating my research questions, MTurk participants who possess these qualifications make suitable surrogates for nonprofessional investors. First, having both previously invested and previously read a financial statement signal that the participant is at least somewhat familiar with accounting information. Second, Farrell, Granier, and Leiby (2014) demonstrate that online laborers exert effort equal to or in excess of other populations when faced with accounting-research focused tasks and, using MTurk workers, Krische (2015) successfully replicates a number of published accounting studies that featured graduate business students as participants. Third, my research instrument is relatively low in integrative complexity, and low-level tasks are less likely to produce differences between surrogates for and actual nonprofessional investors' behavior (Elliott, Hodge, Kennedy, and Pronk 2007).

### **Research Design and Procedures**

For my main analyses, I collect data using a  $2 \times 3$  (number of retweets  $\times$  firm Twitter strategy) plus one (control) between-participants experiment.<sup>14</sup> Participants randomly assigned to one of these seven conditions assumed the role of an investor in a hypothetical company, read its earnings press release, followed the relevant Twitter activity surrounding its release, and answered various investment-related questions. To better ensure that participants attended to the details within my research instrument, I informed participants that they would earn a flat wage for taking the time to participate in my study and could earn *additional* compensation based on their “ability to correctly answer questions about various details of the case materials.”<sup>15</sup>

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<sup>14</sup> The Institutional Review Board at the University of Washington approved the use of human subjects for both this experiment and the follow-up experiment discussed in a subsequent section.

<sup>15</sup> Participants spent an average of 14.2 minutes completing the study and correctly answered an average of 2.7 of 3 bonus questions, indicating that participants were generally paying attention and putting forth effort. Participants earned a total of \$2.25, on average, which equates to an hourly wage of \$9.50. This hourly wage is greater than the wage MTurk participants generally receive from completing research studies on MTurk.com.

After informing participants of these general procedures, I introduced participants to Deluxe Snacks, Inc. (ticker symbol “DLUX”), a hypothetical firm in the snack food industry. I had participants assume they owned 500 shares of stock in Deluxe because current investors should naturally be interested in a firm’s earnings and related Twitter activity. In creating the experimental stimulus, I attempted to mimic the key features of the Twitter.com platform. For instance, when a new tweet with a particular hashtag is posted, it appears above all existing tweets with the same hashtag. To supplement the following discussion, Appendix B illustrates the final screen participants viewed prior to answering any dependent measures (by condition).

The first tweet participants viewed was from the company itself (@DeluxeSnacks). This tweet provided a link to Deluxe’s quarterly earnings press release. At the same time, participants viewed a tweet from a news source, which informed them that Deluxe’s earnings per share of \$1.30 was above the analyst consensus forecast of \$1.28. The survey instructed participants to click on the link Deluxe provided before moving on—doing so opened Deluxe’s press release in a new browser window.

### ***Retweet Manipulation***

After participants opened the press release and clicked “Next,” they arrived at a screen that read “And then you check the Twitter feed again 15 minutes later...” After three seconds, participants automatically advanced to a screen that displayed all prior tweets and one additional tweet. Authored by a person unrelated to the firm (@DayTrader12), this additional tweet highlights and questions a large decrease in Deluxe’s selling, general, and administrative expenses (SG&A), quarter over quarter.<sup>16</sup> Further, the third party cites a large decrease in Deluxe’s bad debt allowance as the reason for this change in SG&A and insinuates that, without

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<sup>16</sup> In a pilot study, participants viewing only the criticism considered @DayTrader12 to *not* be a very credible source of information (i.e., awarding him an average of 3.43 points on a ten-point credibility scale). This rating suggests that study participants do not consider @DayTrader12 to be an expert.

this decrease, Deluxe would not have beat analysts' consensus forecast. I manipulated the perceived consensus backing this criticism via the retweet count on the face of the tweet: one (few retweets, implying lower consensus) or 126 (many retweets, implying higher consensus). To help ensure participants interpreted one retweet as low consensus and not simply that Twitter users had not had sufficient time to retweet the third-party tweet, it was noted as having been posted 14 minutes ago. In addition, this low-consensus third-party tweet did not accumulate any additional retweets throughout the remainder of the study, even though additional time passed and earlier tweets did accumulate additional retweets.<sup>17</sup>

### ***Twitter Strategy Manipulation***

Whereas the content of the third-party tweet was the same for every treatment participant, Deluxe's set of tweets varied across the three strategy conditions. In the No Response Strategy conditions, participants observed no further communication from Deluxe beyond its original tweet. In the Explanation Strategy conditions, Deluxe publicly responded to the third party's criticism directly. Specifically, @DeluxeSnacks tweeted "@DayTrader12: analysts accounted for our lower bad debt estimate in their forecasts... so our \$1.30 is comparable to their \$1.28 #Deluxe." In the Redirection Strategy conditions, Deluxe actively attempted to redirect investors' attention to more favorable news by tweeting a positive highlight printed in its earnings press release. Specifically, @DeluxeSnacks tweeted "Deluxe CEO on conference call: 'We delivered good first quarter results in the face of a challenging marketplace.' #Deluxe."

### ***Control Condition – Absent any Negative Attention***

I also collected data from participants who were exposed to Deluxe's earnings news but not exposed to the third-party criticism or Deluxe's response or non-response. By effectively

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<sup>17</sup> In contrast, the high-consensus third-party tweet does accumulate additional retweets, settling at 141 retweets on the final screen (as depicted in Appendix B).

providing “pre-criticism” judgments, this group of participants allows me to identify the net impact of the two experimental treatments by comparing each of the six treatment-present groups to a treatment-absent (i.e., control) group for each relevant measure.

### ***Investors’ Judgments and Decisions***

Participants answered a series of questions directly after viewing all tweets. First, participants used 11-point scales with verbally labeled endpoints and midpoints to communicate how they would fill in the blanks in the following statements: “As a result of this earnings event and related Twitter activity, I value my position in DLUX stock \_\_\_\_\_ I did before” (*much less than, the same as, much more than*); “As a result of this earnings event and related Twitter activity, I believe that *other* stock market participants value DLUX stock \_\_\_\_\_ before” (*much less than, the same as, much more than*); and “Given what I know about Deluxe, I would like to \_\_\_\_\_ shares of DLUX” (*sell all of my, hold onto my, buy a lot more*). Next, participants used analogously labeled 11-point scales to communicate how the Twitter activity impacted (1) their beliefs about Deluxe’s overall reputation, (2) their feelings about Deluxe, (3) how much they trust Deluxe, and (4) how much they admire and respect Deluxe.<sup>18</sup> I code participants’ responses to these key measures from -5 to +5, with more negative (positive) values indicating a more negative (positive) impact on participants’ perceptions. Participants were not allowed to go back and update any prior responses as they moved through the survey screens that present my dependent measures.

Participants answered a number of additional questions. Because managers are the face of the firm and firm communications could plausibly affect participants’ perceptions of management (Bertrand and Schoar 2003), participants rated management’s ability, benevolence,

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<sup>18</sup> I adapt these four company-level measures from Ponzi et al. (2011), who develop and validate a simplified emotion-based measure of corporate reputation.

and integrity (three components of trustworthiness (Mayer, Davis, and Schoorman 1995)) and the extent to which they believe management is involved in what gets tweeted from Deluxe’s username. To examine whether participants viewed managements’ failure to highlight the decrease in SG&A expenses as a serious offense, participants rated how big of a deal it was that management did not mention the change in SG&A in its press release. After answering manipulation check questions, participants also estimated the likelihood that they would have retweeted or “liked” Deluxe’s final tweet if the hypothetical scenario was real. All responses to these exploratory questions were measured using 11-point scales (coded from 0 to +10) with verbally labeled endpoints (specific labels varied by question). The following screen revealed all three of Deluxe’s responses to the third-party criticism—“No response from Deluxe,” the explanation tweet, and the redirective tweet—which participants ranked from the most to least preferred response. Finally, participants shared demographic data and answered three questions about the specifics of the case materials for the purpose of computing their bonus compensation.

#### **IV. RESULTS AND DISCUSSION**

##### **Manipulation Checks**

To assess the effectiveness of the retweet manipulation, I asked participants to identify how many times the third party’s tweet was retweeted. Eighty-three percent of participants in the six treatment conditions correctly answered “more than 100 times” or “one time,” depending on condition. To assess the effectiveness of the Twitter strategy manipulation, I first showed participants Deluxe’s initial tweet and asked whether there were any other tweets from Deluxe Snacks in the case materials. For participants who answered “Yes” and were truly in either of the active strategy conditions, I then presented both additional tweets (the redirective and the

explanation) and asked participants to select the tweet that they viewed. Seventy-six percent of participants in the six treatment conditions correctly answered this two-part manipulation check.

I perform chi-square tests to investigate whether participants differentially attended to my manipulations and find that any variation across conditions in participants' attention to the strategy manipulation appears to be random (*Strategy*:  $\chi^2(5, N=481) = 5.58; p = 0.35$ ).<sup>19</sup> However, variation across conditions in participants' attention to the retweet manipulation (*Retweets*:  $\chi^2(5, N=481) = 11.74; p = 0.04$ ) appears to be partially driven by the superior performance of participants in the No Response conditions (an 89.4 percent success rate).<sup>20</sup> I use all available participants in the analyses that follow, although using only participants who pass both manipulation checks produces inferentially identical results.

## Hypotheses Tests

I design my experiment to test whether a firm can effectively manage its reputation and consequently, its investment attractiveness, by engaging on Twitter. For the purpose of testing my stated hypotheses, participants' judgments of how the earnings event and related Twitter activity influenced how they value their position in DLUX stock (*Value*), how the market values DLUX stock (*Market*), and whether they would like to sell, hold, or buy shares of DLUX (*Trade*), serve as my proxies for investment attractiveness and my primary dependent measures. These three scales are internally consistent ( $\alpha = 0.82$ ), and so are averaged together to create one variable, *Investment* (-5 to +5). Participants' beliefs about changes in Deluxe's overall reputation (*OverallRep*), feelings about Deluxe (*GoodFeeling*), trust in Deluxe (*Trust*), and admiration and

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<sup>19</sup> All reported *p*-values are two-tailed unless otherwise stated.

<sup>20</sup> This condition's superior success rate is unsurprising given the tweet that included the retweet manipulation was the most recent tweet that these participants viewed. In contrast, participants in either the Explanation or Redirection Strategy conditions all viewed an additional tweet between the retweet manipulation and its related manipulation check. Note that the variation in participants' attention to the retweet manipulation across the four active strategy conditions does appear to be random (*Strategy*:  $\chi^2(3, N=320) = 4.27; p = 0.23$ ).

respect for Deluxe (*Respect*) are also internally consistent ( $\alpha = 0.94$ ), and so are averaged together to create one measure of firm reputation, *Reputation* (-5 to +5).<sup>21</sup> Table 1 presents descriptive statistics for *Investment* and *Reputation* and Figure 2 plots the means for *Investment* by experimental condition. Tabulated analyses are generally robust to the use of any single component of *Investment* or *Reputation* and the few discrepancies that arise are discussed below.

< TABLE 1 AND FIGURE 2 >

### ***Hypothesis 1 – Retweets and Investment Attractiveness***

My first hypothesis predicts that investors view a firm as a less attractive investment after a third-party criticism has been retweeted a meaningful number of times. Table 2 (Table 3), Panel A, reports the main effect of *Retweets* on *Investment* (*Reputation*). When pooling across the three strategy conditions, participants in the Many Retweets conditions judged an investment in Deluxe as less attractive, on average, than participants in the Few Retweets conditions ( $F = 14.02$ ;  $p < 0.01$ ). Accumulating retweets appears to have a similar effect on *Reputation* ( $F = 8.68$ ;  $p < 0.01$ ).

Moreover, without a firm intervention, participants in the Many Retweets/No Response condition reported significant damage to their perceptions of investment attractiveness and firm reputation as a result of the third-party criticism. That is, -0.66 and -0.90 (see Table 1) are significantly lower than the midpoints of their respective scales (0), which divide harm from benefit (*Investment*:  $t = -3.67$ ;  $p < 0.01$ ; *Reputation*:  $t = -4.80$ ;  $p < 0.01$ ; untabulated). In contrast, participants in the Few Retweets/No Response condition reported no such damage (0.38 and 0.08 are statistically greater than and equal to zero, respectively, untabulated). Together, these results

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<sup>21</sup> Reported results are robust to replacing the average measure with factor scores derived using confirmatory principal component analysis.

support H1 and suggest that accumulating retweets is one way a criticism from an individual with unknown credibility can gain traction and influence investors' perceptions.

< TABLE 2 AND TABLE 3 >

### ***Hypotheses 2 and 3 – Firm Engagement and Investment Attractiveness***

My second and third hypotheses posit that how investors respond to a firm's provision of an explanation or a firm's attempt to redirect attention depend on the preceding criticism's level of perceived consensus. First, a  $2 \times 3$  analysis of variance reveals a statistically significant *Retweets*  $\times$  *Strategy* interaction effect when either *Investment* ( $F = 4.07$ ;  $p = 0.02$ , untabulated) or *Reputation* ( $F = 3.74$ ;  $p = 0.03$ , untabulated) is entered as the dependent variable. These results suggest that the criticism's retweet count and the firm's Twitter strategy did indeed interact to affect participants' perceptions of investment attractiveness and of firm reputation. Breaking this interaction into its components—Table 2, Panel A, and Table 3, Panel A, report the  $2 \times 2$  interaction results relevant for examining H2 and H3. Results suggest that the *Retweets*  $\times$  *Strategy* interaction holds for both active strategies (as compared to the No Response Strategy) for *Investment* (*Explanation*:  $F = 8.09$ ;  $p < 0.01$ ; *Redirection*:  $F = 3.79$ ;  $p = 0.05$ ) and for *Reputation* (*Explanation*:  $F = 4.80$ ;  $p = 0.03$ ; *Redirection*:  $F = 6.66$ ;  $p = 0.01$ ).

Table 2, Panel B, and Table 3, Panel B, report the simple effects tests relevant for further examining these interactions. Turning first to H2—although participants in the Many Retweets/Explanation condition judged an investment in Deluxe as more attractive, on average, relative to participants in the Many Retweets/No Response condition (0.10 vs. -0.66;  $F = 10.27$ ;  $p < 0.01$ ), there was no statistically significant difference between the Few Retweets/Explanation and the Few Retweets/No Response conditions (0.19 vs. 0.38;  $F = 0.68$ ;  $p = 0.41$ ). The same pattern of results emerges for *Reputation* (see Table 3, Panel B). These results are consistent with H2 and

suggest that providing an explanation for a criticism received on Twitter can (may not) positively influence perceptions of a firm when the criticism is perceived as being high (low) in consensus.

Turning next to H3—consistent with the predicted interaction, when a third-party criticism has only been retweeted a few times, redirecting attention has no incremental benefit (nor harm) with respect to a firm’s investment attractiveness (0.20 vs. 0.38;  $F = 0.61$ ;  $p = 0.44$ ) or reputation (0.00 vs. 0.08;  $F = 0.13$ ;  $p = 0.72$ ). Yet, contrary to my prediction, participants in the Many Retweets/Redirection condition judged an investment in Deluxe as *more* attractive, on average, relative to participants in the Many Retweets/No Response condition (-0.20 vs. -0.66;  $F = 3.90$ ;  $p = 0.05$ ). These participants also judged Deluxe as being *more* reputable (-0.09 vs. -0.90;  $F = 10.86$ ;  $p < 0.01$ ). Accordingly, it appears that engaging in Redirection may actually prove *beneficial* to a firm that is trying to protect its reputation and its attractiveness as an investment after receiving negative attention on Twitter (relative to taking no action). Despite the statistically significant interaction, given the positive impact of Redirection (vs. No Response) within the Many Retweets condition, the results of my experiment fail to support H3.

## **Supplemental Analyses**

### ***Providing an Explanation vs. Redirecting Attention***

For completeness, Tables 2 and 3 also present simple effects tests comparing the two active strategies, Explanation and Redirection. Results indicate no significant differences between these two strategies with respect to participants’ perceptions of investment attractiveness (both  $F < 1.58$ ; both  $p > 0.21$ ) or firm reputation (both  $F < 1.93$ ; both  $p > 0.17$ ), regardless of the number of retweets.

Although these results suggest that providing an explanation and redirecting attention are comparable with respect to *overall* perceptions of investment attractiveness and firm reputation,

additional analyses on the components of *Investment* and *Reputation* appear to favor Explanation over Redirection. First, additional simple effects tests reveal that participants who received an explanation valued DLUX shares more highly and wanted to own more of these shares than their counterparts who received the redirective (both  $F > 2.92$ ; both  $p < 0.09$ , untabulated). In fact, contrary to the overall measure, neither the mean of *Value* nor *Trade* was significantly different between the Many Retweets/Redirection and Many Retweets/No Response conditions (both  $F < 1.33$ ; both  $p > 0.25$ , untabulated). Second, given a criticism with *few* retweets, participants receiving an explanation reported trusting and respecting Deluxe more than participants receiving a redirective (both  $F > 4.21$ ; both  $p < 0.04$ , untabulated) and, relative to not responding, an explanation appeared to boost participants' trust in Deluxe and perceptions of the market value of DLUX stock (both  $F > 5.51$ ; both  $p < 0.02$ ).

Lending additional support for Explanation as the favored strategy, participants reported a strong preference for the explanation when given a chance to evaluate all three potential response strategies simultaneously. Specifically, whereas the majority of participants (57 percent) ranked the provision of an explanation as the most preferred response to the third-party criticism, only 26 and 17 percent ranked the redirective and non-response as most preferred, respectively ( $\chi^2(2, N=478) = 124.52$ ;  $p < 0.01$ ). Participants also exhibited strong support for the redirective as second-most preferred ( $\chi^2(2, N=471) = 46.41$ ;  $p < 0.01$ ) and not responding as least preferred ( $\chi^2(2, N=473) = 100.94$ ;  $p < 0.01$ ).<sup>22</sup> This clear rank-ordering suggests that the observed equivalence of the Explanation and Redirection strategies may be due to investors having relatively low expectations with respect to firms directly responding to negative attention on Twitter (and so, the redirective does not feel inadequate when viewed in isolation). If enough

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<sup>22</sup> There were ten instances in which a participant reported not being able to choose between two strategies for a particular rank. These ties were left out of these analyses.

firms begin directly responding to Twitter users, however, firms that do not may end up being penalized in the long run as investors update these expectations.

Finally, as it pertains to the dissemination of and support for firm communications, I also examine whether a participant's propensity to retweet or "like" Deluxe's tweets varied by treatment condition. Whereas participants in either active strategy condition made their judgments about Deluxe's respective response tweet, participants in the No Response condition did so for the original earnings release tweet. This investigation reveals that the redirective is less likely to be retweeted and less likely to be "liked" than either its original earnings release tweet or its explanation (all  $F > 2.84$ ; all  $p < 0.09$ , untabulated). This result may be informative for firm managers who are interested in learning what they can do to generate a network of support and information dissemination on social media.

### ***Mediation Analysis***

Next, I test whether participants' perceptions of firm reputation help explain the observed effects of a criticism's retweet count and a firm's Twitter strategy on participants' judgments of investment attractiveness. I use a structural equations model (SEM) to test for mediation because Iacobucci, Saldanha, and Deng (2007) demonstrate that SEM is superior to the four-step regression method presented by Baron and Kenny (1986), particularly when a researcher has multiple measures of the latent constructs. SEM's two primary advantages are its ability to simultaneously estimate all relevant relations and its ability to deal with measurement error (Iacobucci 2009, 2010). For example, the SEM approach avoids multicollinearity issues by first estimating individual factors for my latent constructs of interest using the relevant measures in my experimental instrument—*Value*, *Market*, and *Trade* for investment attractiveness and *OverallRep*, *GoodFeeling*, *Trust*, and *Respect* for firm reputation—and then simultaneously

estimating the specified relations between experimental treatments and these factors. Figure 3 presents the summarized results of this analysis.

< FIGURE 3 >

When controlling for perceptions of firm reputation, the direct effects of Retweets (H1), Retweets  $\times$  Explanation (H2), and Retweets  $\times$  Redirection (H3) on investment attractiveness are not statistically significant (all  $|t| < 1.39$ ; all  $p > 0.16$ ), while the indirect effects *are* significant. That is, the combinations of independent factors that capture the main findings in Tables 2 and 3 help explain participants' perceptions of firm reputation (all  $|t| > 1.92$ ; all  $p < 0.06$ ) and participants' perceptions of firm reputation help explain participants' perceptions of investment attractiveness ( $t = 15.72$ ;  $p < 0.01$ ).<sup>23</sup> Together, these results are consistent with the theory that a criticism's retweet count and a firm's Twitter strategy affect investors' perceptions of investment attractiveness *through* their perceptions of firm reputation.

### ***The Consequences of Negative Social Media Chatter***

In contrast to participants in most treatment conditions (who typically reported no change or negative changes in perceptions), participants in the control condition reported significantly *positive* changes in their views of the firm, on average. That is, 1.43 and 1.62 are significantly greater than the midpoints of the *Investment* and *Reputation* scales, respectively (both  $t > 9.70$ ; both  $p < 0.01$ , untabulated). Thus, it appears that working to repair reputational damage may not lead investors back to the same positive perceptions they would have had, had no damage occurred. To test this assertion, Table 4 reports the results of planned comparisons between the control condition and each treatment condition. Results suggest that participants in the control

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<sup>23</sup> The model appears to be a relatively good fit, with a Standardized Root Mean Square Residual (SRMR) of 0.04, a Comparative Fit Index (CFI) of 0.94, and a chi-squared statistic divided by its degrees of freedom ( $\chi^2/df$ ) of 6.31. A model is considered a good fit when SRMR is close to 0.09 (or lower), CFI is close to 0.95 (or higher), and  $\chi^2/df$  is about 3.00 or under (Iacobucci 2010; Kline 2004; Marsh, Hau, and Wen 2004).

condition consistently considered Deluxe to be a more attractive investment (Panel A) and a more reputable firm (Panel B), relative to their counterparts in each treatment condition.<sup>24</sup>

In addition, the results presented in Panel C suggest that participants who viewed the third-party criticism uniformly trust Deluxe's *management* less than participants who did not view this criticism.<sup>25</sup> This result is intuitive because (1) forthcomingness is taken to be a positive quality (Mercer 2005) and (2) when management's *failure* to be forthcoming is brought to investors' attention by a third party, investors are likely to question management's intentions, motive, and/or character, damaging perceptions of trustworthiness as a result. Taken together, the results presented in Table 4 suggest that there may be meaningful benefits associated with taking care to preempt or prevent negative attention on social media.

< TABLE 4 >

### ***Experiment 2 – A Closer Look at the Redirection Strategy***

Despite my *ex ante* expectation that the Redirection Strategy would backfire, redirecting attention actually proved useful for repairing damaged perceptions of investment attractiveness and reputation. There are several potential theoretical explanations for this result. For example, investors could (1) be acting in accordance with motivated reasoning theory (Kunda 1990)—that is, the redirective could be providing individuals currently invested in the firm the support they need to rationalize viewing Deluxe positively; (2) be interpreting Deluxe's choice to say something but explain nothing as an indication that the criticism is *unworthy* of a more direct

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<sup>24</sup> I use Dunnett's method to control for the higher incidence of Type I error that comes with making multiple comparisons.

<sup>25</sup> The three 11-point scales designed to measure perceptions of management's ability, benevolence, and integrity are internally consistent ( $\alpha = 0.85$ ) and so are averaged together to create one measure, *Trustworthiness* (0 to 10). Despite a significant correlation between *Trustworthiness* and all component measures of *Investment* and *Reputation* (all  $p < 0.01$ , untabulated), a six-celled analysis of variance with *Trustworthiness* as the dependent measure reveals that there are no statistically significant differences in participants' judgments of management's trustworthiness across treatment conditions ( $F = 1.71$ ;  $p = 0.13$ , untabulated). As a result, I do not perform any additional analyses with *Trustworthiness* as the dependent measure.

response; or (3) be attending primarily to the information that is most salient—that is, the tweet could successfully remind investors that the original news from the firm is, in fact, good news.

To shed light on these explanations, I collect additional data using a follow-up three-celled between-participants experiment ( $N = 89$ ). Research procedures were identical between Experiments 1 and 2 with the following exceptions. First, to test the legitimacy of the motivated reasoning explanation, participants of Experiment 2 assumed the role of a *potential* investor in Deluxe (as opposed to an *existing* investor, as in Experiment 1). Second, *all* participants of Experiment 2 viewed a third-party criticism with many retweets. Third, Experiment 2 ended shortly after participants provided the relevant reputation judgments. Lastly, in place of the Explanation condition, Experiment 2 employed a modified Redirection condition, which presented a tweet identical to that of the Redirection Strategy except that it was authored by a news source instead of the firm. Experiment 2 presented two versions of the Redirection Strategy for the purpose of identifying whether the relevant result of Experiment 1 was driven primarily by the *source* of the redirective tweet. Together, participants of Experiment 2 were randomly assigned to one of three conditions: No Response, Redirection-Firm, or Redirection-News.

In sum, the results of Experiment 2 refute the motivated reasoning and criticism undermining explanations and support the salience explanation. First, Experiment 2 replicated the Redirection vs. No Response result from Experiment 1 despite participants no longer being motivated to see the firm in a positive light. That is, *prospective investor*-participants in Experiment 2's Redirection-Firm condition still judged an investment as more attractive and the firm as more reputable, on average, than participants in Experiment 2's No Response condition (*Investment*: -0.08 vs. -0.59;  $F = 1.83$ ;  $p = 0.09$ , one-tailed, untabulated; *Reputation*: -0.48 vs. -1.23;  $F = 3.35$ ;  $p = 0.04$ , one-tailed, untabulated). This behavior is consistent with that of the

*currently invested*-participants of Experiment 1 and thus rules out motivated reasoning as an explanation for the original findings.

Second, participants in Experiment 2's Redirection-News condition also judged an investment as more attractive and the firm as more reputable, on average, than participants in Experiment 2's No Response condition (*Investment*: -0.02 vs. -0.59;  $F = 2.21$ ;  $p = 0.07$ , one-tailed, untabulated; *Reputation*: -0.29 vs. -1.23;  $F = 5.18$ ;  $p = 0.01$ , one-tailed, untabulated).

These results (1) rule out the idea that a firm's vocal non-response was taken as a signal about the worthiness of the criticism by participants of Experiment 1, and (2) imply that Redirection can be beneficial even if the firm is not the one doing the redirecting.

## V. CONCLUSION

With the introduction and growing use of social media, both the informal and formal rules of firm-investor and investor-investor communication are changing (Kaplan and Haenlein 2010). For instance, the unfiltered and public nature of social media has moved firms closer to a two-way model of communication in which firm managers feel additional pressure to publicly engage with all types of stakeholders. Although firm managers can exert some influence over professional analysts' behavior (Feng and McVay 2010), managers are unlikely to have the same influence over the non-affiliated analysts and investors who interact and provide financial advice online for public consumption. As individuals' opinions, predictions, and decisions can be disseminated more widely now that social networks have moved online, the impact of a single statement can be significant. In some instances, it can be in a firm's best interest to acknowledge and respond to public statements made on social media—that is, firms may be able to temper adverse effects by joining rather than abstaining from the conversation. Accordingly, I examine how a firm's engagement with individuals after receiving negative attention on social media

affects a firm's reputation and its attractiveness as an investment.

Using an experiment, I demonstrate that a third-party criticism, even one that is unfounded, can (1) still cause individuals to question the positive feelings about a firm's attractiveness as an investment, reputation, and management's trustworthiness born out of a positive earnings announcement, and (2) cause real harm to investors' perceptions of the firm if it gets reposted a meaningful number of times. In addition, I investigate the effects of three strategies a firm might consider in response to receiving negative attention on social media: (1) abstaining from the conversation, (2) actively attempting to redirect investors' attention to more favorable information, and (3) actively addressing the criticism by publicly responding to the individual's concerns directly. When taken together, results suggest that both active strategies appear to have reputation-repairing benefits (relative to doing nothing) when investors' perceptions have been harmed. Further, the success of the redirective I examine does not appear to depend on which credible source the tweet is from (firm or news organization); instead, *what* investors are redirected *to* may be more important.

Interestingly, although the Explanation and Redirection strategies appear similar with respect to managing investors' overall perceptions of the firm, my results suggest that an explanation is likely to garner more support (by accumulating "likes") and is likely to reach farther within the investor community (by accumulating retweets) than a redirective. In addition, investors may be more likely to favor an explanation over an attempt to redirect attention when evaluating the two strategies side-by-side (e.g., when evaluating two different firms' social media strategies). Finally, I examine whether participants' perceptions of firm reputation explain the observed differences in perceived investment attractiveness—I find that they do. Specifically,

results are consistent with perceptions of firm reputation mediating the relation between the social media activity participants view and their judgments of investment attractiveness.

My study has at least three limitations that lay the groundwork for future research. First, because firms that discuss financial information via social media must make it clear to investors that they will be using a particular platform (SEC 2013), I chose to hold constant investors' prior knowledge of the firm's Twitter presence by having the company disseminate its own press release via Twitter. Thus, my results speak to firms *that use* social media. Future research could investigate when *completely* abstaining from social media may be a superior strategy.

Second, there are infinite ways to vary the exact content of a firm's selected response. I chose to test two different firm tweets and the absence of a tweet to capture the spirit of three broader strategies. However, given a specific strategy, how a firm constructs its responses (e.g., what pronouns, words, or acronyms it uses) is likely to have implications for investors' perceptions (as suggested by the evidence in Hales, Kuang, and Venkataraman (2011), Loftus (2015), and Rennekamp (2012)). I leave it to future research to explore the effects of strategies not tested in this study and the effects of variations in word choice given a particular strategy.

Third, when firm management chooses to engage with stakeholders on social media, it exposes itself to the possibility of sparking additional conversation. That is, capital market participants who are active on social media could have something (positive or negative) to say in response. I do not allow for this second stage interaction in this study. Given my research design, an additional stimulus would make it difficult to isolate the cause of any observed differences in investors' perceptions across conditions, clouding my inferences. Thus, whether the nature of third-party *responses* to firm posts impacts investors' perceptions remains an open question for future research.

APPENDIX A: Example of negative attention on Twitter (@ReformedBroker, 141K followers).\*

The screenshot shows a Twitter thread. At the top is a tweet from **Downtown Josh Brown** (@ReformedBroker), who is followed by the user. The tweet text reads: "Citi's core business was terrible this quarter (net income down 8%), but it 'beat' by pulling from the loss reserves cookie jar. Again. \$C". Below the tweet, it shows 21 retweets and 13 favorites. The tweet is dated 5:42 AM - 14 Apr 2014. Below the tweet is a reply box with the text "Reply to @ReformedBroker". The thread continues with several replies:


- Ivan the K™** (@IvanTheK) - Apr 14: "@ReformedBroker Regulators don't eat cookies, so Citi still has work to do." (1 Reply, 1 Retweet, 1 Favorite)
- JJ** (@JJSinghSTARR) - Apr 14: "@ReformedBroker surely if you fail a stress test you should be increasing reserves. I think Corbat misunderstood..." (1 Reply, 1 Retweet, 1 Favorite)
- Veris** (@verisbenchmarks) - Apr 14: "@ReformedBroker Ha ha, there's always some slight of hand accounting involved." (1 Reply, 1 Retweet, 1 Favorite)
- Michael Shea** (@cirrusdriver) - Apr 14: "@ReformedBroker But the analyst who was on tv 10 seconds after the release didn't say this." (1 Reply, 1 Retweet, 1 Favorite)
- Njonjo Ndehi** (@bensonndehi) - Apr 14: "Cooking the books using the Goal Seek feature of Excel. @ReformedBroker" (1 Reply, 1 Retweet, 1 Favorite)
- Chris Arnade** (@Chris\_arnade) - Apr 14: "@IvanTheK @reformedbroker in a true economic meritocracy Citi would not exist. I say this as someone who worked there for 20 years.." (1 Reply, 1 Retweet, 1 Favorite)
- Rob Haldeman** (@Rob\_Haldeman) - Apr 14: "@ReformedBroker talking heads lovin \$C right now. Guess I have to read this for myself now #duediligence" (1 Reply, 1 Retweet, 1 Favorite)
- Craig Scott** (@CraigScott31) - Apr 14: "@ReformedBroker I do think \$bac report Wed will start to differentiate from the pack as ML unit should be a gem." (1 Reply, 1 Retweet, 1 Favorite)

\* Follower counts in this appendix and throughout the paper are as of May 26, 2016.


**APPENDIX B: Experimental Materials** – each image represents the final screen of the experimental case for a different experimental condition.


PASSIVE STRATEGY / FEW RETWEETS CONDITION

**Recent tweets with hashtag #Deluxe:**





**Peter H.** @DayTrader12 · 29 min ago  
 #Deluxe only “beat” analysts’ consensus by pulling from the bad debt allowance cookie jar. Note the big drop in SG&A expenses!

RETWEETS  1




**WallStreetNewsNow** @StreetNewsNow · 43 min ago  
 EPS alert: #Deluxe posts earnings of \$1.30 a share vs. wall street analysts’ consensus forecast of \$1.28

RETWEETS  4




**Deluxe Snacks, Inc.** @DeluxeSnacks · 50 min ago  
 #Deluxe reports 1st quarter 2014 financial results. Press release available here: [go.Deluxe.com/1Kr3](http://go.Deluxe.com/1Kr3)










RETWEETS  6


PASSIVE STRATEGY / MANY RETWEETS CONDITION

**Recent tweets with hashtag #Deluxe:**





**Peter H.** @DayTrader12 · 29 min ago  
 #Deluxe only “beat” analysts’ consensus by pulling from the bad debt allowance cookie jar. Note the big drop in SG&A expenses!

RETWEETS          141









**WallStreetNewsNow** @StreetNewsNow · 43 min ago  
 EPS alert: #Deluxe posts earnings of \$1.30 a share vs. wall street analysts’ consensus forecast of \$1.28

RETWEETS  4



**Deluxe Snacks, Inc.** @DeluxeSnacks · 50 min ago  
 #Deluxe reports 1st quarter 2014 financial results. Press release available here: [go.Deluxe.com/1Kr3](http://go.Deluxe.com/1Kr3)

RETWEETS       6








REDIRECTION STRATEGY / FEW RETWEETS CONDITION

**Recent tweets with hashtag #Deluxe:**

	<b>Deluxe Snacks, Inc.</b> @DeluxeSnacks · 1 min ago Deluxe CEO on conference call: "We delivered good first quarter results in the face of a challenging marketplace." #Deluxe	RETWEETS 0
	<b>Peter H.</b> @DayTrader12 · 29 min ago #Deluxe only "beat" analysts' consensus by pulling from the bad debt allowance cookie jar. Note the big drop in SG&A expenses!	RETWEETS 1 
	<b>WallStreetNewsNow</b> @StreetNewsNow · 43 min ago EPS alert: #Deluxe posts earnings of \$1.30 a share vs. wall street analysts' consensus forecast of \$1.28	RETWEETS 4 
	<b>Deluxe Snacks, Inc.</b> @DeluxeSnacks · 50 min ago #Deluxe reports 1st quarter 2014 financial results. Press release available here: <a href="http://go.Deluxe.com/1Kr3">go.Deluxe.com/1Kr3</a>	RETWEETS 6 

REDIRECTION STRATEGY / MANY RETWEETS CONDITION

**Recent tweets with hashtag #Deluxe:**

	<b>Deluxe Snacks, Inc.</b> @DeluxeSnacks · 1 min ago Deluxe CEO on conference call: "We delivered good first quarter results in the face of a challenging marketplace." #Deluxe	RETWEETS 0
	<b>Peter H.</b> @DayTrader12 · 29 min ago #Deluxe only "beat" analysts' consensus by pulling from the bad debt allowance cookie jar. Note the big drop in SG&A expenses!	RETWEETS 141 
	<b>WallStreetNewsNow</b> @StreetNewsNow · 43 min ago EPS alert: #Deluxe posts earnings of \$1.30 a share vs. wall street analysts' consensus forecast of \$1.28	RETWEETS 4 
	<b>Deluxe Snacks, Inc.</b> @DeluxeSnacks · 50 min ago #Deluxe reports 1st quarter 2014 financial results. Press release available here: <a href="http://go.Deluxe.com/1Kr3">go.Deluxe.com/1Kr3</a>	RETWEETS 6 

EXPLANATION STRATEGY / FEW RETWEETS CONDITION

**Recent tweets with hashtag #Deluxe:**



**Deluxe Snacks, Inc.** @DeluxeSnacks · 1 min ago  
 @DayTrader12: Analysts accounted for our lower bad debt estimate in their forecasts... So our \$1.30 is comparable to their \$1.28 #Deluxe

RETWEETS  
0



**Peter H.** @DayTrader12 · 29 min ago  
 #Deluxe only “beat” analysts’ consensus by pulling from the bad debt allowance cookie jar. Note the big drop in SG&A expenses!

RETWEETS  
1





**WallStreetNewsNow** @StreetNewsNow · 43 min ago  
 EPS alert: #Deluxe posts earnings of \$1.30 a share vs. wall street analysts’ consensus forecast of \$1.28

RETWEETS  
4





**Deluxe Snacks, Inc.** @DeluxeSnacks · 50 min ago  
 #Deluxe reports 1st quarter 2014 financial results. Press release available here: [go.Deluxe.com/1Kr3](http://go.Deluxe.com/1Kr3)

RETWEETS  
6



EXPLANATION STRATEGY / MANY RETWEETS CONDITION

**Recent tweets with hashtag #Deluxe:**



**Deluxe Snacks, Inc.** @DeluxeSnacks · 1 min ago  
 @DayTrader12: Analysts accounted for our lower bad debt estimate in their forecasts... So our \$1.30 is comparable to their \$1.28 #Deluxe

RETWEETS  
0



**Peter H.** @DayTrader12 · 29 min ago  
 #Deluxe only “beat” analysts’ consensus by pulling from the bad debt allowance cookie jar. Note the big drop in SG&A expenses!

RETWEETS  
141





**WallStreetNewsNow** @StreetNewsNow · 43 min ago  
 EPS alert: #Deluxe posts earnings of \$1.30 a share vs. wall street analysts’ consensus forecast of \$1.28

RETWEETS  
4





**Deluxe Snacks, Inc.** @DeluxeSnacks · 50 min ago  
 #Deluxe reports 1st quarter 2014 financial results. Press release available here: [go.Deluxe.com/1Kr3](http://go.Deluxe.com/1Kr3)

RETWEETS  
6



CONTROL CONDITION

**Recent tweets with hashtag #Deluxe:**

	<b>WallStreetNewsNow</b> @StreetNewsNow · 43 min ago EPS alert: #Deluxe posts earnings of \$1.30 a share vs. wall street analysts' consensus forecast of \$1.28
RETWEETS 4	 
	<b>Deluxe Snacks, Inc.</b> @DeluxeSnacks · 50 min ago #Deluxe reports 1st quarter 2014 financial results. Press release available here: <a href="http://go.Deluxe.com/1Kr3">go.Deluxe.com/1Kr3</a>
RETWEETS 6	

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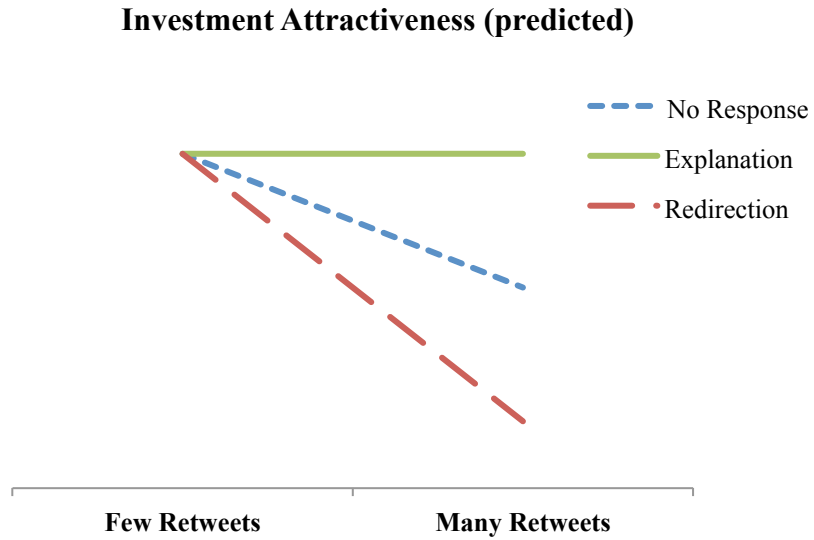
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## FIGURE 1

*Predicted effects of third-party criticism retweet count and firm Twitter strategy on investment attractiveness (H1-H2)*

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Figure 1 illustrates my hypotheses concerning investors' perceptions of a firm's attractiveness as an investment. In my experiment, I manipulate the number of retweets a third-party criticism accumulates (few vs. many) and a firm's strategy for handling negative attention on Twitter (No Response vs. Explanation vs. Redirection). The downward trend when moving from left to right depicts H1, reflecting my expectation that investment attractiveness will be damaged more when a third-party criticism has been retweeted many (relative to few) times. Together, all points in the figure depict the interactions stated in H2 and H3—that (i) providing an explanation for a third-party criticism with many retweets unwinds damage but attempting to redirect attention to more favorable portions of the firm disclosure causes further harm, and (ii) there will be little to no differences between strategies when a third-party criticism has only a few retweets.

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**FIGURE 2**

*Observed effects of third-party criticism retweet count and firm Twitter strategy on investment attractiveness*

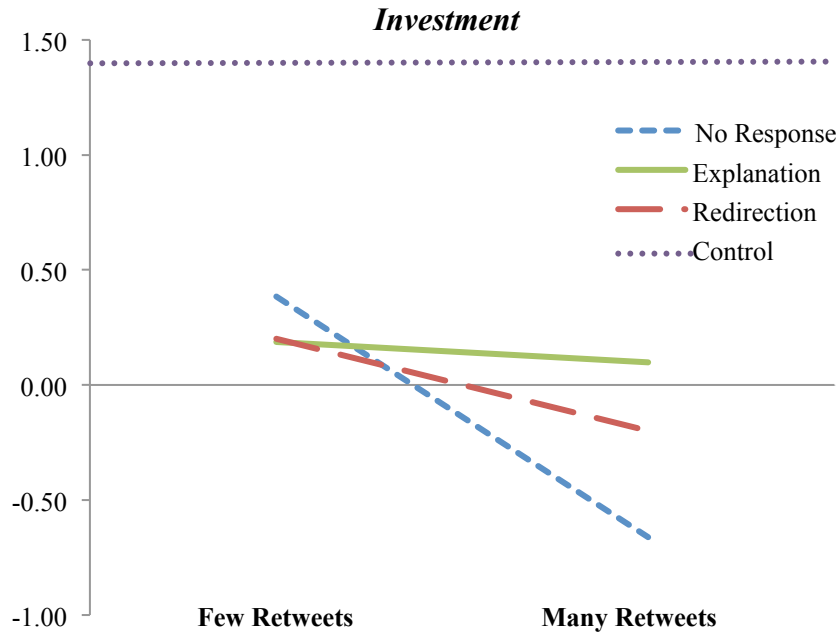


Figure 2 illustrates the means for my primary dependent measure, *Investment*, by experimental condition as reported in Table 1. In my experiment, I manipulate the number of retweets a third-party criticism accumulates (few vs. many) and a firm's strategy for handling negative attention on Twitter (No Response vs. Explanation vs. Redirection). These two manipulations result in six treatment conditions. Note that the Control condition is visually represented as a line (.....), though it is only one condition. Participants randomly assigned to the Control condition answer the same primary dependent measures as all other participants, but do so without ever viewing the third-party criticism or subsequent firm response or non-response.

**FIGURE 3**

*Mediation analysis: the indirect effects of retweets and firm Twitter strategy on investment attractiveness through perceptions of firm reputation*

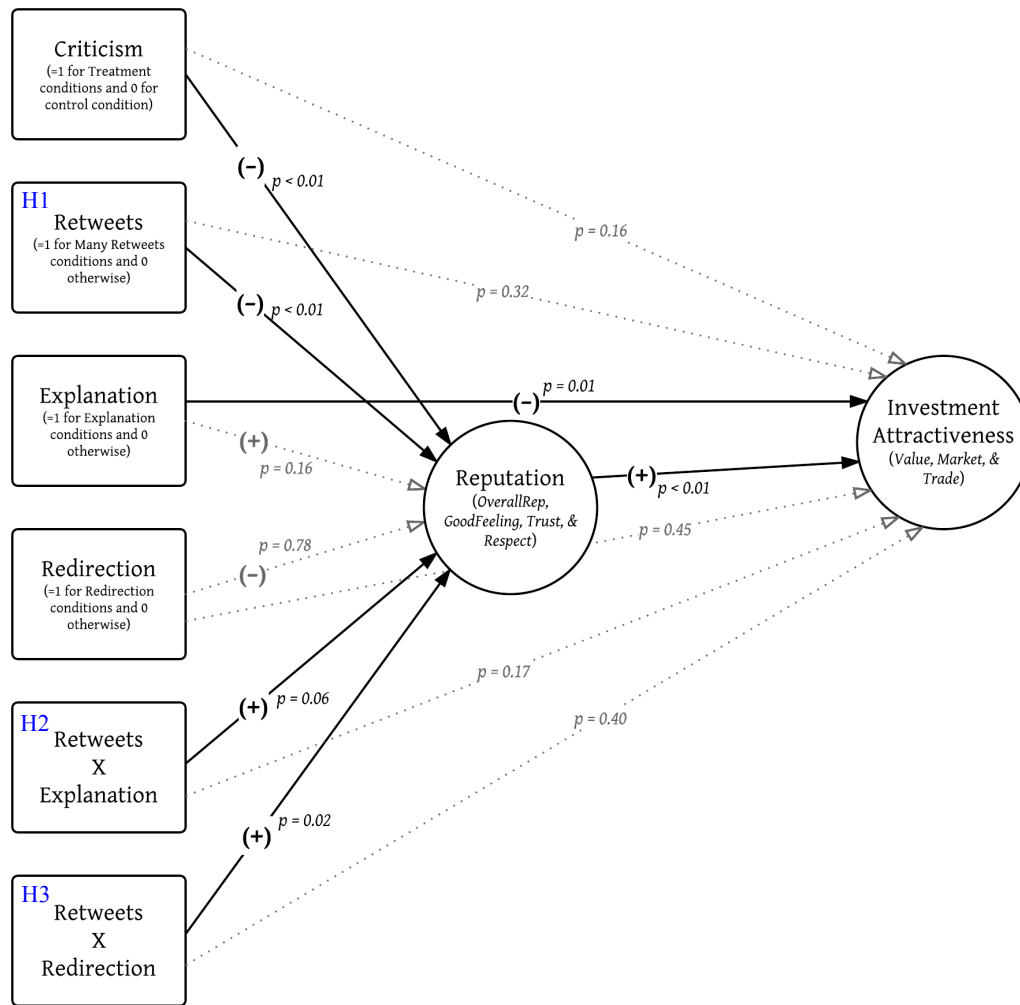


Figure 3 presents a summary of the structural equations model (SEM) relevant for investigating the role of firm reputation in the relation between observed Twitter activity and investment attractiveness. All  $p$ -values are two-tailed.

SEMs include a measurement model, which relates observed variables to the specified constructs, and a structural model, which relates these constructs to other constructs (Iacobucci 2009). The measurement model in this analysis (not pictured) creates an Investment Attractiveness factor using *Value*, *Market*, and *Trade* and a Reputation factor using *OverallRep*, *GoodFeeling*, *Trust*, and *Respect* (all of these variables are defined in Table 1). In addition to these factors, I enter six independent variables into the structural model: *Criticism*, *Retweets*, *Explanation*, *Redirection*, *Retweets × Explanation*, and *Retweets × Redirection* (all of these variables are defined in the figure above).

The base condition for this model is the control condition, which implies that all coefficients measure effects that are relative to this base condition. Given *Retweets*, *Explanation*, and *Redirection* are present in the model, the coefficient on *Criticism* represents the effect of the 3<sup>rd</sup> party criticism given no firm response and the coefficient on *Retweets* represents the incremental effect of that criticism gaining retweets (still given no firm response) (part of H1). Given the two interaction terms in the model, the coefficient on *Explanation (Redirection)* represents the incremental effect of providing an explanation (attempting to redirect attention) given few retweets, relative to not responding. Lastly, the coefficient on *Retweets × Explanation* represents the differential effect of providing an explanation in the face of many (relative to few) retweets (H2), and the coefficient on *Retweets × Redirection* represents the differential effect of attempting to redirect attention in the face of many (relative to few) retweets (H3).

**TABLE 1**

*Descriptive statistics: investment attractiveness and firm reputation*

**Panel A: Descriptive statistics for investment judgments – dependent variable is *Investment* (mean, [standard deviation])**

<i>Retweets</i>	<i>Strategy</i>			Control
	No Response	Explanation	Redirection	
Few	0.38 [1.50] <i>n</i> = 80	0.19 [1.66] <i>n</i> = 77	0.20 [1.48] <i>n</i> = 83	1.43 [1.30] <i>n</i> = 77
Many	-0.66 [1.62] <i>n</i> = 81	0.10 [1.41] <i>n</i> = 78	-0.20 [1.48] <i>n</i> = 82	

**Panel B: Descriptive statistics for perceptions of firm reputation – dependent variable is *Reputation* (mean, [standard deviation])**

<i>Retweets</i>	<i>Strategy</i>			Control
	No Response	Explanation	Redirection	
Few	0.08 [1.53] <i>n</i> = 80	0.34 [1.61] <i>n</i> = 77	0.00 [1.59] <i>n</i> = 83	1.62 [1.39] <i>n</i> = 77
Many	-0.90 [1.69] <i>n</i> = 81	0.14 [1.61] <i>n</i> = 78	-0.09 [1.62] <i>n</i> = 82	

Table 1 presents descriptive statistics for my principal dependent measure (Panel A) and proposed mediator (Panel B) by experimental condition. In my experiment, I manipulate the number of retweets a third-party criticism accumulates (few vs. many) and a firm’s strategy for handling negative attention on Twitter (No Response vs. Explanation vs. Redirection). These two manipulations result in six treatment conditions. Participants randomly assigned to the Control condition answer the same primary measures as all other participants, but do so without ever viewing the third-party criticism (or subsequent firm response or non-response).

*Investment*: Participants use three 11-point scales (coded -5 to +5) with verbally labeled endpoints and midpoints to communicate how they would fill in the blanks in the following statements: “As a result of this earnings event and related Twitter activity, I value my position in DLUX stock \_\_\_\_\_ I did before.” (*much less than, the same as, much more than*), “As a result of this earnings event and related Twitter activity, I believe that other stock market participants value DLUX stock \_\_\_\_\_ before.” (*much less than, the same as, much more than*), and “Given what I know about Deluxe, I would like to \_\_\_\_\_ shares of DLUX.” (*sell all of my, hold onto my, buy a lot more*). These three measures (*Value, Market, and Trade*, respectively) are then averaged together to create one combined measure representing the impact of the relevant Twitter activity on perceptions of investment attractiveness.

*Reputation*: Participants use four 11-point scales (coded -5 to +5) with verbally labeled endpoints and midpoints to communicate how they would fill in the blanks in the following statements: “I believe that the series of tweets I viewed was \_\_\_\_\_ Deluxe’s overall reputation” (*extremely harmful to, neither harmful to nor beneficial for, extremely beneficial for*), “The series of tweets I viewed made me feel \_\_\_\_\_ about Deluxe, as a company” (*much worse, neither worse nor better, much better*), “The series of tweets I viewed made me trust Deluxe \_\_\_\_\_, as a company” (*much less, neither less nor more, much more*), and “The series of tweets I viewed made me admire and respect Deluxe \_\_\_\_\_, as a company” (*much less, neither less nor more, much more*). These four measures (*OverallRep, GoodFeeling, Trust, and Respect*, respectively) are then averaged together to create one combined measure representing the impact of the relevant Twitter activity on perceptions of firm reputation.

**TABLE 2**

*Hypothesis tests: investment attractiveness*

<b>Panel A: Analyses of variance – dependent variable is <i>Investment</i></b>						
Source of Variation		Sum of Squares	d.f.	Mean Square	<i>F</i> -Statistic	<i>p</i> -value
<b>H1 (main effect):</b>						
<i>Retweets</i>		31.41	1	31.41	14.02	<0.01
<i>Error</i>		1234.68	551	2.24		
<b>H2 (disordinal interaction):</b>						
<i>Retweets × Strategy (Explanation vs. No Response)</i>		18.12	1	18.12	8.09	<0.01
<i>Error</i>		1234.68	551	2.24		
<b>H3 (disordinal interaction):</b>						
<i>Retweets × Strategy (Redirection vs. No Response)</i>		8.50	1	8.50	3.79	0.05
<i>Error</i>		1234.68	551	2.24		
<b>Panel B: Simple effects tests – dependent variable is <i>Investment</i></b>						
Fixed Condition	Source of Variation	Sum of Squares	d.f.	Mean Square	<i>F</i> -Statistic	<i>p</i> -value
<i>Few Retweets</i>	<i>Explanation vs. No Response</i>	1.53	1	1.53	0.68	0.41
	<i>Error</i>	1234.68	551	2.24		
	<i>Redirection vs. No Response</i>	1.36	1	1.36	0.61	0.44
	<i>Error</i>	1234.68	551	2.24		
	<i>Explanation vs. Redirection</i>	0.01	1	0.01	0.00	0.95
	<i>Error</i>	1234.68	551	2.24		
<i>Many Retweets</i>	<i>Explanation vs. No Response</i>	23.00	1	23.00	10.27	<0.01
	<i>Error</i>	1234.68	551	2.24		
	<i>Redirection vs. No Response</i>	8.75	1	8.75	3.90	0.05
	<i>Error</i>	1234.68	551	2.24		
	<i>Explanation vs. Redirection</i>	3.54	1	3.54	1.58	0.21
	<i>Error</i>	1234.68	551	2.24		

Table 2 presents the analyses relevant for testing my hypotheses. The dependent variable in all analyses is *Investment* (defined in Table 1), which represents the impact of the relevant Twitter activity on perceptions of investment attractiveness. All *p*-values are two-tailed.

Panel A presents tests of H1 (main effect or Retweets), H2 (interaction of Retweets and Explanation), and H3 (interaction of Retweets and Redirection). Panel B presents simple effects tests relevant for understanding the interaction results reported in Panel A.

**TABLE 3**  
*Firm reputation*

<b>Panel A: Analyses of variance – dependent variable is <i>Reputation</i></b>						
Source of Variation		Sum of Squares	d.f.	Mean Square	<i>F</i> -Statistic	<i>p</i> -value
<b>H1 (main effect):</b>						
<i>Retweets</i>		21.68	1	21.68	8.68	<0.01
<i>Error</i>		1376.08	551	2.50		
<b>H2 (disordinal interaction):</b>						
<i>Retweets × Strategy (Explanation vs. No Response)</i>		11.99	1	11.99	4.80	0.03
<i>Error</i>		1376.08	551	2.50		
<b>H3 (disordinal interaction):</b>						
<i>Retweets × Strategy (Redirection vs. No Response)</i>		16.62	1	16.62	6.66	0.01
<i>Error</i>		1376.08	551	2.50		
<b>Panel B: Simple effects tests – dependent variable is <i>Reputation</i></b>						
Fixed Condition	Source of Variation	Sum of Squares	d.f.	Mean Square	<i>F</i> -Statistic	<i>p</i> -value
<i>Few Retweets</i>	<i>Explanation vs. No Response</i>	2.65	1	2.65	1.06	0.30
	<i>Error</i>	1376.08	551	2.50		
	<i>Redirection vs. No Response</i>	0.31	1	0.31	0.13	0.72
	<i>Error</i>	1376.08	551	2.50		
	<i>Explanation vs. Redirection</i>	4.81	1	4.81	1.93	0.17
	<i>Error</i>	1376.08	551	2.50		
<i>Many Retweets</i>	<i>Explanation vs. No Response</i>	42.90	1	42.90	17.18	<0.01
	<i>Error</i>	1376.08	551	2.50		
	<i>Redirection vs. No Response</i>	27.12	1	27.12	10.86	<0.01
	<i>Error</i>	1376.08	551	2.50		
	<i>Explanation vs. Redirection</i>	1.99	1	1.99	0.80	0.37
	<i>Error</i>	1376.08	551	2.50		

Table 3 presents analyses of firm reputation that parallel those presented in Table 2. The dependent variable in all analyses is *Reputation* (defined in Table 1), which represents the impact of the relevant Twitter activity on perceptions of firm reputation. All *p*-values are two-tailed.

Panel A presents tests related to H1 (main effect or Retweets), H2 (interaction of Retweets and Explanation), and H3 (interaction of Retweets and Redirection). Panel B presents simple effects tests relevant for understanding the interaction results reported in Panel A.

**T A B L E 4**

*Supplemental analyses: comparisons to the Control condition*

**Panel A: Planned comparisons of each treatment group to the control group using Dunnett’s test – dependent variable is *Investment***

<i>Retweets / Strategy</i> Treatment Condition	Mean Difference (Treatment – Control)	Std. Error	<i>p</i> -value	95% Confidence Interval (Upper Bound)
Few / No Response	-1.05	0.24	<0.01	-0.43
Many / No Response	-2.10	0.24	<0.01	-1.48
Few / Explanation	-1.25	0.24	<0.01	-0.63
Many / Explanation	-1.33	0.24	<0.01	-0.72
Few / Redirection	-1.23	0.24	<0.01	-0.62
Many / Redirection	-1.63	0.24	<0.01	-1.02

**Panel B: Planned comparisons of each treatment group to the control group using Dunnett’s test – dependent variable is *Reputation***

<i>Retweets / Strategy</i> Treatment Condition	Mean Difference (Treatment – Control)	Std. Error	<i>p</i> -value	95% Confidence Interval (Upper Bound)
Few / No Response	-1.54	0.25	<0.01	-0.89
Many / No Response	-2.52	0.25	<0.01	-1.88
Few / Explanation	-1.28	0.25	<0.01	-0.62
Many / Explanation	-1.49	0.25	<0.01	-0.83
Few / Redirection	-1.63	0.25	<0.01	-0.98
Many / Redirection	-1.71	0.25	<0.01	-1.06

**Panel C: Planned comparisons of each treatment group to the control group using Dunnett’s test – dependent variable is *Trustworthiness***

<i>Retweets / Strategy</i> Treatment Condition	Mean Difference (Treatment – Control)	Std. Error	<i>p</i> -value	95% Confidence Interval (Upper Bound)
Few / No Response	-1.12	0.29	<0.01	-0.37
Many / No Response	-1.40	0.29	<0.01	-0.66
Few / Explanation	-0.67	0.29	0.10	0.09
Many / Explanation	-0.77	0.29	0.04	-0.02
Few / Redirection	-0.98	0.29	<0.01	-0.24
Many / Redirection	-1.20	0.29	<0.01	-0.45

Table 4 presents the results of pairwise comparisons between each treatment group and the control group. Dunnett’s test is used to correct for the higher probability of Type I error that comes with considering multiple comparisons simultaneously. Dunnett’s test is only appropriate when each comparison is made against a single control group. Panel A, Panel B, and Panel C report differences in investors’ perceptions of (a) investment attractiveness, (b) firm reputation, and (c) management’s trustworthiness, respectively, between each treatment condition and the control condition. All *p*-values are two-tailed.

*Reputation* and *Investment* are as defined in Table 1. *Trustworthiness* is defined as follows: Participants use three 11-point scales (coded 0 to 10) with verbally labeled endpoints to communicate how much they agree with the statements “I believe that Deluxe’s management...” (a) “is very competent at providing financial disclosures” (*strongly disagree* to *strongly agree*), (b) “acts with integrity when providing financial disclosures” (*strongly disagree* to *strongly agree*), and (c) “puts its investors’ interests ahead of its own” (*strongly disagree* to *strongly agree*). These three measures are then averaged together to create one combined measure representing participants’ perceptions of management’s trustworthiness.