Management Science

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http://pubsonline.informs.org/journal/mnsc

MANAGEMENT SCIENCE
Vol. 66, No. 3, March 2020, pp. 1473–1495
ISSN 0025-1909 (print), ISSN 1526-5501 (online)

Managing Negative Celebrity Endorser Publicity: How Announcements of Firm (Non)Responses Affect Stock Returns

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Received: May 22, 2017
Revised: April 27, 2018; September 25, 2018
Accepted: October 26, 2018
Published Online in Articles in Advance: March 6, 2019

https://doi.org/10.1287/mnsc.2018.3243

Abstract. Celebrity endorsers can cause negative publicity that can spill over to the endorsed brand. However, little is known about the economic effects of firm reactions to these events. This study fills this gap and estimates how announcements of firms' reactions (yes versus no), timing (slow versus fast), and type (maintain/suspend versus no reaction) affect daily abnormal stock returns (ARs) following negative publicity. Using 128 events of negative endorser publicity between 1988 and 2016 affecting firms in 230 cases, this study offers new and economically relevant insights. The most surprising finding is that firms can gain value depending on their response. Announcements of firms' reactions positively affect ARs, especially if they occur quickly after negative publicity surfaces. The analyses reveal that fast (slow) announcements of firms' reactions increase (decrease) firm value by 2.10% (–1.88%) over the next four trading weeks. Results also show that issuing statements suspending or maintaining the endorser both yield more positive ARs than not reacting at all. Further analyses identify conditions under which the stock market rewards maintaining or suspending an endorser. Firms have more positive ARs when they (1) suspend higher-blame endorsers, (2) suspend endorsers whose negative publicity is related to their occupation, (3) maintain endorsers with a high product fit, and (4) do not suspend apologetic endorsers. This study discusses implications for theory and practice and provides a strong empirical foundation for understanding the consequences of firm reaction announcements to negative celebrity endorser publicity.

History: Accepted by Juanjuan Zhang, marketing.
Supplemental Material: The online appendix is available at https://doi.org/10.1287/mnsc.2018.3243

Keywords: celebrity endorsement • negative publicity • scandal • crisis management • firm reaction • event study • stock return

Introduction

Celebrity endorsement is omnipresent in today's marketplace. In the United States, over 20% of advertisements feature celebrity endorsers and firms can benefit significantly from this relationship (Agrawal and Kamakura 1995, Elberse and Verleun 2012, Chung et al. 2013). Some brands even build their entire advertising strategy around a single endorser, such as George Clooney for Nespresso worldwide (*The Guardian* 2013). NBA player LeBron James recently signed a lifetime extension with Nike that could be worth US$1 billion, and the world's 100 top-earning athletes derive almost US$1 billion from endorsements and appearances per year (*Forbes* 2017a, b), highlighting the tremendous value that firms hope to extract from their endorser(s).

At the same time, reports of misbehavior become more frequent and can tarnish the endorser's stellar image (e.g., Tiger Woods' extramarital affairs or Michael Phelps smoking marijuana). This undesirable behavior can lead to negative spillover effects, such as lower evaluations of the endorsed product or brand (Till and Shimp 1998, White et al. 2009), which results in lower sales and profit (Tybout et al. 1981, Chung et al. 2013). Consequently, stock returns decrease significantly following the negative publicity (Louie et al. 2001, Bartz et al. 2013, Knittel and Stango 2014). For instance, Knittel and Stango (2014) report that Tiger Woods' sponsors lost more than 2% of their market value in the three weeks following his 2009 scandal.

However, do firms have to take these losses for granted? Since negative publicity can quickly evolve into a media firestorm, firms typically act under time pressure while facing the following important questions. Should firms react to the negative publicity or remain quiet? If firms react, should they react quickly or slowly, and should they maintain or suspend the endorser? Which response strategy preserves sales and brand equity while minimizing direct and indirect costs, and thus is perceived most positively by the stock market? Interestingly, one can make arguments for either course of action.

On the one hand, firm reactions might increase the salience of the event and draw unnecessary attention to it, thereby fueling the media firestorm and exacerbating the negative stock market effects. On the other hand, firm reactions can reduce information asymmetry about the event's financial implications for the firm, thereby mitigating the negative stock market effects. Similarly, firms could relieve investors' concerns about negative spillover effects by suspending an endorser with a tarnished reputation before the contract ends. However, firms could also believe that the damage for the endorser's image is only temporary and eliminate investors' concerns about sustainable spillover effects by maintaining the endorser. Therefore, it is a priori not clear how firms should react to reduce the negative stock market effects. Bilateral arguments can also be made for the timing of firm reaction. Media attention is typically the highest at the onset of the event while there is a lot of speculation about the event and its consequences. A fast reaction might prevent a downward spiral, thereby attenuating the negative stock market effects. By contrast, a slow reaction might be perceived more positively by the stock market, because it allows the firm to gather more information and make a more educated decision.

Adding more complexity to the assessment of the different response options, firms must take event and endorser characteristics into account. How much is the endorser to blame (e.g., domestic violence versus nude pictures on the internet)? Is the negative publicity related to the occupation of the endorser or is it a private issue (e.g., athlete accused of doping versus tax evasion)? How well do the endorser and the product fit (e.g., actress endorsing cosmetics versus power tools)? How does the endorser react to the negative publicity (e.g., apologetic versus not)? How do these factors interact with a firm's decision to react and shape the stock market's response?

Extant research cannot provide a definitive answer to any of these questions. Table 1 gives an overview of the existing literature studying the impact of negative endorser publicity on stock returns, which largely ignores firms' response strategies (Louie et al. 2001, Leeds 2010, Hood 2012, Bartz et al. 2013, Knittel and Stango 2014). The present study contributes to this literature by exploring in-depth how the stock market evaluates announcements of firms' response strategies to negative endorser publicity.

Because research lacks definitive answers, it is not surprising that firms, uncertain about the impact of their responses, display the full range of reactions, even for the same event. For instance, going back to the introductory examples, Tiger Woods was maintained by Nike following his extramarital affairs (day 0), whereas Accenture suspended him (day 10) and AT&T remained quiet (no reaction at all). Likewise, Michael Phelps was maintained by Visa (day 1), whereas Kellogg's suspended him (day 3) and Under Armour remained quiet (no reaction at all). This study's 29-year sample describes this heterogeneity in firms' responses: 59% of the firms remained quiet and 41% reacted, with 21% of firms maintaining their endorser and 20% suspending him/her; 14% of firms reacting on the event day, 18% during the first trading week, 5% during the second, 2% during the third, and 1% during the fourth.

This study estimates the impact of these firms' response announcements on stock returns[1] and provides firms with guidance regarding the following questions:

1. What is the impact of firm reactions to negative endorser publicity on stock returns?
2. What is the impact of a slow (versus fast) reaction on stock returns?
3. What is the impact of a firm's decision to maintain or to suspend the endorser on stock returns?
4. How do endorser's blame, relationship of the event to the endorser's occupation, endorser-product fit, and endorser apology moderate the relationship between firms' decisions to maintain or suspend the endorser and stock returns?

Table 1. Contribution to Literature on Negative Celebrity Endorser Publicity and Stock Returns

				Firms' response			
Study	Period	Events	*N*	Response yes/no	Response timing	Response type	Response*moderators
Bartz et al. 2013	1986–2011	93	na	✓		Suspend only	
Hood 2012	2009	1	6				
Knittel and Stango 2014	2009	1	7				
Leeds 2010	2006	1	1				
Louie et al. 2001	1980–1994	52	128				
This study	1988–2016	128	230	✓	✓	Suspend, maintain, quiet	Blame, occupation-related, product fit, endorser apology

Note. na, not applicable.

Providing insights to these open empirical questions is important from both a theoretical and managerial perspective. From a theoretical perspective, it is key for researchers to not only comprehend how announcements of firm reactions to negative endorser publicity affect firms' value but also to understand the conditions under which the stock market rewards maintaining or suspending an endorser. Studying investors' response to these announcements "allows researchers to isolate, in a forward-looking manner, the expected value that the firm will derive from a corporate action that has just been revealed to the public. In other words, this value—measured as the sum of the incremental future cash flows expected from the corporate action, discounted to the current period—can be measured at the time of the announcement, before the cash flows actually materialize" (Sorescu et al. 2017, p. 186). Understanding stock market's response to these announcements can provide additional insights into the general economic value of endorsements. From a practitioner perspective, firms require guidance on how their attempts to mitigate the negative spillover effects influence their performance. This guidance not only includes knowing the economic consequences of their response strategy, but also understanding how contextual factors shape the stock market's evaluation, so that firms could gather all necessary information before responding appropriately.

Based on these questions, this study quantifies the impact of announcements of firm reaction (yes versus no), timing (slow versus fast), type (suspend and maintain versus no response), and the four moderating variables (blame, occupation, product fit, endorser reaction) on abnormal stock returns (ARs). This study analyzes 128 cases of negative celebrity endorser publicity between 1988 and 2016, affecting firms in 230 cases. The results offer new and economically relevant insights. The most surprising finding is that firms do not only avoid losses, but even gain in value depending on their response. Announcements of firm reactions positively affect *ARs*, especially if they occur quickly after the negative publicity surfaces. The analysis reveals that announcements of fast (slow) firm reactions increase (decrease) firm value by 2.10% (−1.88%) over the next four trading weeks. Results show that issuing statements suspending or maintaining the endorser both yield more positive ARs than not reacting at all. Further analyses demonstrate that firms have more positive ARs when they (1) suspend higher blame endorsers, (2) suspend endorsers whose negative publicity is related to their occupation, (3) maintain endorsers with a high product fit, and (4) do not suspend apologetic endorsers. This study subjects all findings to a wide range of alternative model specifications to ensure that estimates are unbiased and generalizable.

Theoretical Background

Negative endorser publicity is conceptually very different from other crisis events such as product recalls (e.g., Chen et al. 2009, Eilert et al. 2017, Liu et al. 2017), and hence, firms' responses to these events need to be analyzed separately. There are multiple reasons for that. First, if a product is hazardous, firms cannot decide to remain quiet because authorities such as the Consumer Product Safety Commission in the United States force firms to take corrective action. However, no third party can force firms to react to negative endorser publicity. The firm can therefore choose if and when it responds. Second, the locus of control is different. Firms are typically responsible for the faulty product, but they are usually not responsible for their endorser's misbehavior, which gives them the opportunity to distance themselves from the negative publicity and suspend the endorser. Third, negative endorser publicity has very different context variables than product recalls such as endorser blame, relationship between misbehavior and endorser occupation, endorser-product fit, and endorser apology. The following sections discuss these factors.

Effects of Firms' Responses on Stock Returns

Research in experimental psychology (Fiske 1980, Kahneman and Tversky 1982) and finance (De Bondt and Thaler 1985, 1987) suggests that actors tend to overreact to unexpected and negative events. Do firms' responses draw unnecessary attention to the negative event and its consequences for the firm, thereby exacerbating the investors' negative reaction, or do firms' responses reduce information uncertainty, thereby attenuating investors' negative reaction? If the firm decides to remain quiet, investors do not receive any signal whether the firm is aware of the event, and motivated/capable to counteract the negative spillover effects. This ongoing uncertainty will lead investors to correct the initial reaction, and consequently stock returns will be more negative on the following days. On the contrary, a responding firm reduces information uncertainty, because it discloses its intentions to the stock market, thereby relieving investors' concerns about the firm's motivation/ability to handle the event. Investors correct their initial overreaction, and consequently stock returns will be more positive on the following days.

Effect of Response Timing on Stock Returns

Firms might refrain from showing a quick response because they might lack certain information and fear that their (uninformed) response is inappropriate. Accordingly, they decide to wait and gather more information about the event before they respond. However, information asymmetry, level of uncertainty, and media scrutiny are the highest at the onset of negative events (Bundy and Pfarrer 2015). In such an environment, a quick response is riskier for firms yet much more diagnostic for investors. Research on impression formation suggests that if actors address negative information quickly, they are perceived as more credible and persuasive (Eagly et al. 1978), as well as more likable (Archer and Burleson 1980). On the contrary, a firm that reacts slowly can create feelings of indifference and/or uncontrollability (Grunig et al. 1992), which damages trust and ultimately the relationship between the involved parties. Therefore, response timing is an important cue for the stock market about a firm's motivation and ability to respond to the negative publicity.

Effect of Response Type on Stock Returns

Once firms choose to respond, they also need to decide on how to respond. Firms can either maintain or suspend the endorser. If the event sustainably, negatively affects the endorser's image and credibility, suspending the endorser (versus no response) is probably perceived more positively by the stock market, because the firm is willing and able to prevent negative spillover effects, such as stakeholders creating negative word-of-mouth and/or terminating the relationship (Coombs 2007).

Above argumentation implies that maintaining the endorser is potentially a worse signal than remaining silent because the firm becomes guilty by association by publicly tolerating the endorser's misbehavior (Carrillat et al. 2014). But what if the firm believes that the event is *not* creating sustainable damage to the endorser's reputation and credibility, and the endorser still can contribute to the firm's marketing performance in a positive way? And what if, at the same time, investors believe so too, or at least they are uncertain about the answer to this question? In this case, remaining quiet causes information uncertainty about the firm's belief, which creates the negative consequences outlined earlier. However, if the firm decides to signal to investors that the endorser is still valuable to the firm, this information uncertainty is eliminated. Accordingly, stock returns should be more positive on the days following the announcement of suspending or maintaining the endorser.

Moderating Factors

Of course, a firm's decision to maintain or suspend should not be arbitrary but rather should account for contextual factors. Therefore, this study subsequently discusses four managerially relevant moderators that show under which conditions a firm's announcement to maintain or suspend the endorser translates into more positive or negative stock returns. Based on related literature, this study considers idiosyncratic aspects of both the event and the endorser (McGinnies and Ward 1980, Lafferty and Goldsmith 1999, Goldsmith et al. 2000, Louie et al. 2001, Lafferty et al. 2002, Louie and Obermiller 2002, Ding et al. 2011, Bartz et al. 2013, Carrillat et al. 2013, Thomas and Fowler 2016). Events differ with regards to (1) the perceived blame of the endorser and (2) the relationship of the negative publicity to the endorser's occupation. Endorsers differ with regards to (3) their product fit and (4) their response to the negative publicity.

Moderating Effect of Blame

Evaluators use situational attributions to assess responsibility and blame (Coombs 1995, Bundy and Pfarrer 2015). The events in this study vary widely with regards to the perceived blame of the endorser. For instance, an endorser who is arrested for domestic violence is more to blame for the event than an endorser whose nude pictures are widely spread on the internet. Therefore, endorsers' blame determines which firm response evaluators perceive as adequate (Louie and Obermiller 2002).

Higher blame events damage the endorser's reputation more and increase the firm's risk of becoming guilty by association. In this situation, investors expect the firm to disassociate itself from the endorser. Maintaining higher blame endorsers is typically a bad signal to the stock market, because the probability of a negative spillover effect is high. For lower blame events, attributions may become less negative because evaluators insinuate maladroitness rather than malevolence by the endorser, and, in the extreme case, attributions may even revert and become positive, including sympathy for the blunderer (Weiner 1986). Suspending a lower blame endorser is a bad signal to the stock market, because it shows disloyalty and/or casts a damning light on the hitherto relationship between endorser and firm. On the contrary, maintaining a lower blame endorser sends a positive signal to investors and reassures them of the good relationship between both parties. In sum, stock returns should be (1) more positive (negative) on the days following the announcement of suspending (maintaining) a higher blame endorser, and (2) more negative (positive) when suspending (maintaining) a lower blame endorser.

Moderating Effect of Occupation

The effectiveness of endorsers largely depends on their credibility (Goldsmith et al. 2000, Lafferty et al. 2002), for which expertise is the major source (Ohanian 1990, Till and Busler 2000). This expertise refers to the endorser's qualification, skillfulness, or knowledge, which are fueled by the endorser's success in his/her occupation. For instance, Nike presumably hired athletes Justin Gatlin and Tiger Woods for their performance on the track and on the golf course, respectively.

Events can differ with regards to the relationship of the negative publicity and the occupation of the endorser. During their tenure with Nike, both celebrities caused negative publicity. Gatlin produced a positive doping test, which was clearly related to his profession. Woods, on the other hand, was accused of adultery, which was clearly unrelated to his profession. Gatlin's case immediately raises the question whether he could have delivered his performances without doping. Maintaining Gatlin as an endorser becomes less beneficial for Nike, because his misbehavior diminishes his credibility and expertise as successful athlete. Wood's case does not raise these concerns. In sum, stock returns should be (1) more positive (negative) on the days following the announcement of suspending (maintaining) an endorser whose negative publicity is related to his/her profession, and (2) more negative (positive) when suspending (maintaining) an endorser whose negative publicity is unrelated to his/her profession.

Moderating Effect of Product Fit

Endorsers differ with regards to perceived product fit (Ding et al. 2011, Bartz et al. 2013). Product fit is a positive function of the number of nodes that the celebrity and product have in common in consumers' memory networks. A high fit is based on stronger cognitive links than a low fit (Keller 2003, Carrillat et al. 2013). For instance, an athlete endorsing sportswear (a consulting firm) is considered a good (bad) fit. A high fit between product and endorser can enhance brand recall, brand affect, and purchase intentions (Kamins 1990, Misra and Beatty 1990, Kamins and Gupta 1994).

If a firm decides to (not) disassociate itself from a high fit endorser following negative publicity, it loses (retains) these benefits (Carrillat et al. 2013). On the contrary, there is not much of an advantage to maintain the low fit endorser, because the smaller benefits are less likely to outweigh the risk of negative spillover effects. Accordingly, stock returns should be (1) more negative (positive) on the days following the announcement of suspending (maintaining) an endorser with a high product fit, and (2) more positive (negative) when suspending (maintaining) an endorser with a low product fit.

Moderating Effect of Endorser Apology

Endorsers also have to decide if and how they should react to the negative publicity. Apologies can reduce evaluators' negative perceptions after the misbehavior (Coombs 1998, Bottom et al. 2002, Coombs and Holladay 2004). Although apologies might not be able to fully repair the damaged image, they are more effective than any other (non)response option if there is credible evidence for the allegations (93.7% in this study's sample; only 6.3% of events turned out to be rumors). Admitting the misbehavior can maintain an endorser's trustworthiness (Carrillat et al. 2013) and an apology (26% in this study's sample) is therefore the most beneficial endorser response (Thomas and Fowler 2016).

Maintaining an apologetic endorser seems to be reasonable, because the endorser has more likely reinstated his/her benefits for the firm. On the contrary, maintaining the nonapologetic endorser (all else equal) is a more negative signal to the stock market because the endorser appears to be a less trustworthy partner for the brand. Investors are uncertain about the reasons for this counterintuitive firm response and fear negative spillover effects. Thus, they prefer a suspension of the nonapologetic endorser. On the contrary, suspending the apologetic endorser is perceived more negatively because the firm punishes the remorseful endorser unnecessarily. In sum, stock returns should be (1) more negative (positive) on the days following the announcement of suspending (maintaining) an apologetic endorser and (2) more positive (negative) when suspending (maintaining) a nonapologetic endorser.

Figure 1 summarizes the conceptual model and directional expectations for the effects discussed above. This model will guide the data analysis and discussion of results presented below.

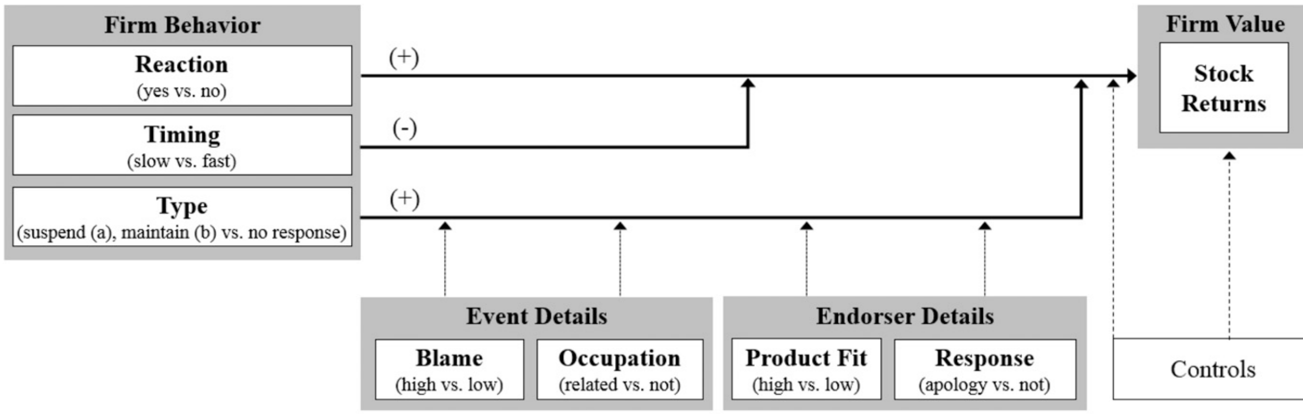
Data

The data for the empirical analyses stem from several major sources: LexisNexis and Factiva databases for celebrity misbehavior and media data, Center for Research in Security Prices (CRSP) for firm performance, Compustat for firm attributes, Kantar Media for advertising spending, marketing research firm Survey Sampling International (SSI) for marketing managers' assessment of the misbehavior, and coded values of the events by two research assistants (RAs) blind to the goals of the study. Table 2 features key variables, operationalization, and data sources.

Sample

The sample of the event study consists of publicly traded companies (NYSE, NASDAQ), which employed celebrity endorsers who generated negative publicity while being under contract between 1988 and 2016. For instance, Ben Johnson's doping scandal following the 1988 Olympics is not part of the sample, because his sponsors (e.g., Diadora, Kyodo Oil, Mazda) were not listed on U.S. markets. A search of major world newspapers using the databases LexisNexis and Factiva, and on the internet (see Online Appendix A for a list of keywords) yielded 146 events (cases of negative publicity) for 260 observations (publicly traded firms). Some individuals endorsed more than one firm (e.g., Michael

Figure 1. Conceptual Model



Directional Expectations for Moderating Effects	High Blame	Related to Occupation	High Product Fit	Endorser Apology
Suspend (a)	+	+	-	-
Maintain (b)	-	-	+	+

Vick: 4 firms) and some firms were affected by several events (e.g., Nike: 23 times). Thirty observations had to be excluded, because more than one event occurred during the event window, making it impossible to isolate the effect of the individual events. For instance, Michael Phelps' pictures smoking marijuana leaked on February 1, 2009, just three trading days before steroid allegations implicating Alex Rodriguez surfaced. Both athletes were sponsored by Activision Blizzard (Guitar Hero), so these two data points had to be excluded to ensure that one event does not affect the other. The same rationale was applied to the other excluded cases.

The final data set consists of 128 cases of endorser misbehavior, affecting firms in 230 cases (Table B1 in Online Appendix B), which is superior to other event studies in this area (Louie et al. 2001, Ding et al. 2011, Bartz et al. 2013, Knittel and Stango 2014). In line with the findings of Sorescu et al. (2017), estimating all models using the subsample of firms without confounding events (e.g., quarterly earnings, mergers and acquisitions, C-suite changes) shows that results are robust. Most of the 230 observations occurred between 2010 and 2016 (50%), followed by 2000–2009 (36%), whereas the 1990s (11%) and 1980s (3%) represented the fewest (59% of the events involved athletes, 24% TV or radio personalities, and 17% musicians). Most of the celebrities were male (70%) and endorsed more than one firm (83%).

Dependent Variable: Abnormal Stock Returns

The dependent variable is abnormal stock returns (ARs). This study applies the Fama and French four-factor model (Fama and French 1993, Carhart 1997) and regresses each firm's stock returns on the relevant market index as well as the size, value, and momentum factor over the estimation period $t = -255$ to $t = -11$ relative to the event day $t = 0$:

$$R_{it} - R_{RFt} = \alpha_i + \beta_i \cdot RMRF_t + s_i \cdot SMB_t + h_i \cdot HML_t + u_i \cdot UMD_t + \varepsilon_{it}, \quad (1)$$

where R_{it} is the stock return i on day t, before R_{RFt} is the risk-free rate of return on day t, and $RMRF_t$ is the risk-free adjusted market return on day t. Thus, the difference between the actual return R_{it} and expected return R_{RFt} constitutes the AR of stock i on day t. Factor SMB_t is the difference between small and large stock returns on day t, HML_t between high and low book-to-market stock returns on day t, and UMD_t between stock returns with an upward and downward momentum factor. ε_{it} refers to the error term of stock i on day t. Intercept α_i is the AR of stock i on day t. The four slope estimates β_i, s_i, h_i, and u_i measure the sensitivity of stock i's risk-free adjusted return for the four risk factors.

Focal Independent Variables (Archival Data)

Firm Response (Yes vs. No). A search in the databases LexisNexis and Factiva, and on the internet revealed that 95 firms reacted to the negative publicity within 20 trading days, while 135 remained quiet.

Timing (Slow vs. Fast). A search in the databases LexisNexis and Factiva, and on the internet identified the exact day a firm reacted to the negative publicity.[2]

Table 2. Variables for Baseline Model M1

Variable	Operationalization	Source
Abnormal Return (AR)$_{i*e,t}$	Actual minus expected stock return for firm i and event e on day t; metric	Compustat
Advertising Spending$_{i*e,t}$	ln(ad spending for firm i after event e on day $t+1$) / ln(ad spending of firm i during the year before the event $e+1$); metric; Z-standardized	Kantar
Blame$_e$	Perceived blame of the endorser for the event e (1 = not at all, 7 = very much); metric; Z-standardized	SSI
Brand$_{i*e}$	Whether the endorsing firm i is a subsidiary (1) or the parent firm (0) during event e; binary	Coded
Endorser Response$_{e,t}$	Whether the endorser apologized for event e (1 for day t of apology and all subsequent days; else 0); binary	Coded
Event Day$_t$	ln(Event Day + 1); metric	Coded
Firm Response (Day of)$_{i*e,t}$	Whether the firm responded to the negative publicity (1 for day t of the firm response only; else 0); binary	Coded
Firm Response$_{i*e,t}$	Whether the firm responded to the negative publicity (1 for all days t after the response; else 0); binary	Coded
Event Year$_e$	Year of the event e; metric; Z-standardized	Coded
Leverage$_{i*e}$	Total Liabilities / Total Assets for firm i prior event e (1 year); metric; Z-standardized	Compustat
Maintain$_{i*e,t}$	Whether firm i maintains the endorser involved in event e (1 for all days t after the response; else 0); binary	Coded
Market-to-Book Ratio$_{i*e}$	Book value of a firm i divided by its market value prior event e (1 year); metric; Z-standardized	Compustat
Media Coverage: Negative Publicity$_{i*e,t}$	Ln (Sum of Associated Press (AP) articles mentioning event e on day $t+1$) / ln(Sum of Associated Press (AP) articles mentioning firm i on day $t+1$); metric; Z-standardized	Factiva
Occupation$_e$	Whether (1) or not (0) the negative publicity of event e is related to the occupation of the endorser; binary	Coded
Product Fit$_{i*e}$	Perceived fit between endorser involved in event e and product of firm i (-100 = not good at all, +100 = very good); metric; Z-standardized	SSI
Return on Asset$_{i*e}$	Net income divided by total assets for firm i prior event e (1 year); metric; Z-standardized	Compustat
Rumor$_e$	Whether the negative publicity of event e turns out to be a rumor (1) or fact (0); binary	Coded
Sales$_{i*e}$	Logarithm of unit sales for firm i prior event e (1 year); metric; Z-standardized	Compustat
Suspend$_{i*e,t}$	Whether or not firm i suspends the endorser involved in event e (1 for all days t after the response; else 0); binary	Coded
Timing$_t$ *(slow vs. fast)*	ln(Event Day + 1); metric; [note: the firm response timing effect is modeled as interaction between *Firm Response*$_{i*e,t}$ and *Timing*$_t$ *(slow vs. fast)*]	Factiva

Type (Suspend vs. Maintain). Two RAs blind to the goals of the study coded the 95 firm reactions as either suspending or maintaining the endorser. They agreed in 89% of firm reactions and the remaining cases were resolved through discussion.

Occupation (Related vs. Not). Celebrities in the sample were either athletes, musicians or TV/radio personalities. Two RAs blind to the goals of this study coded all 230 cases to determine whether their negative publicity was related to their profession. Each RA received a short description of the event, such as "A famous athlete is accused of doping" (Gatlin and Nike, related) or "A famous athlete is accused of having multiple extramarital affairs" (Woods and Nike, unrelated), and asked them whether (1) or not (0) the negative publicity is related to their profession. The two RAs agreed in 90% of cases and the remaining ones were resolved through discussion.

Endorser Response (Apology vs. Not). Two RAs blind to the goals of this study coded 196 endorser reactions (endorsers remained quiet in 34 cases). They agreed in 93% of endorser reactions and the remaining ones were resolved through discussion.

Focal Independent Variables (Survey Data)

Data on *Blame (high versus low)* and *Product Fit (high versus low)* stem from a survey among U.S. marketing professionals age 30 and above. Participants (317) completed the survey in exchange for $12 ($M_{\text{age}}$ = 51.50, 47% female, $M_{\text{completion time}}$ = 15 minutes).

Participants were recruited by marketing research firm SSI and averaged 13.86 years of marketing experience. About 75% of the participants earned at least a bachelor's degree, 85% were currently in a managing position, 76% had hiring and firing authority, and 40% were owner, CEO, president, executive director, or vice president within their firm.

To avoid fatigue, each participant evaluated a random subset of 14 different cases of negative endorser publicity and seven celebrity-product fits. Each event was evaluated by at least 30 participants. Some events were identical and only had to be evaluated once. For instance, in 10 cases athletes were accused of domestic violence and the endorsing firm remained quiet.

Following the approach of Louie et al. (2001), identities of endorser and firm were withheld to get an unbiased evaluation of each event. Participants rated blame on a seven-point Likert scale (1 = not at all; 7 = very). For instance, Mike Tyson's domestic violence case was described as "A famous athlete is accused of domestic violence. How much is the celebrity to blame for the event?" After each event's evaluation, participants had to guess the endorser. Even for the most unique and publicized events, only a fraction of participants guessed the endorser correctly. Brian Williams's exaggerated war stories received the highest percentage of correct guesses (38%).

Next, respondents rated the endorser-product fit on a sliding scale (−100 = not a good fit; +100 = very good fit). For instance, Charles Barkley and Weight Watchers were described as "A famous former athlete is endorsing weight loss products and services. How well do the endorser and the product fit?" Product fit ranged from as low as −37.72 for an athlete endorsing oil and gas products to as high as 86.00 for an athlete endorsing sporting goods.

Control Variables

Following prior research in the endorsement and other crisis management literature, this study includes the following 13 control variables. Previous research has shown that changes in *Advertising Spending*[3] can influence ARs (Cleeren et al. 2013, Gao et al. 2015). *Event Day* measures the day after the initial event. *Firm Response (Day of)* controls for the effect of the firm's response announcement only on the day of the announcement. *Endorser Response* can affect consumer perceptions (Thomas and Fowler 2016) and might affect investors' perceptions as well. The amount of media coverage can influence *ARs* (Bartz et al. 2013, Liu et al. 2017), so the model includes *Media Coverage (Pre-Event)* and *Media Coverage (Post-Event)*. Stock market effects might be weaker for subsidiary *Brands* as opposed to parent brands (Chen et al. 2009, Liu et al. 2017). The model also accounts for differences in firms regarding debt ratios (*Leverage*; Chen et al. 2009), growth potential (*Market-to-Book Ratio* [MTBR]; Bartz et al. 2013, Liu et al. 2017), efficiency (*Return-on-Assets* [ROA]; Wowak et al. 2015, Eilert et al. 2017), and size (*Sales*; Chen et al. 2009, Gao et al. 2015). *Rumor*[4] ensures that events are not biased by ignoring nonproven events. *Event Year* accounts for time trends.

All metric independent focal and control variables enter the model *Z*-standardized to support the interpretation of their relative impact. *Event Day* enters the model unstandardized so that the model's intercept reflects stock returns on event day 0.

Methodology

There are three building blocks of the methodology and analysis strategy. First, the event study regression model captures the dynamics of ARs for each firm and event before and after the day of the firm reaction announcement. Second, three specific model setups test the effects. Third, a variety of alternative model specifications assesses the robustness of findings.

Event Study Regression Model

This study follows prior research in finance and uses a model similar to the event study regression model (Beber and Pagano (2013, p. 363), based on Boehmer et al. (2013, p. 1372))[5] to estimate the average impact of the negative endorser publicity on abnormal stock return of the endorsing firm(s). The basic panel regression has the following form:

$$AR_{it} = \alpha_i + \beta \cdot D_{it} + \theta \cdot X_{it} + \varepsilon_{it}. \quad (2)$$

The dependent variable AR for each firm i on day t is a function of the indicator variable D_{it}, other covariates X_{it}, and the error term ε_{it}. The indicator variable is a dummy variable, which has the value of 1 for the event window of interest (t_1, t_2). Herein D_{it} indicates whether or not the firm showed a response; this variable has the value on 1 for all days t_1 to t_2 following the firm's response (in this case, t_2 is the end of the examined window). The coefficient β measures the abnormal return, which can be attributed to the firm's response. Knittel and Stango (2014) used a very similar approach to measure the impact of endorser misbehavior on stock returns. Assuming a single event and only static covariates, Online Appendix C shows that cumulative abnormal return (CAR) regression and event study regression are equivalent and produce the same effects. The next section explains why event study regression is superior in our context to the commonly used CAR regression.

Temporal Aggregation Bias and the Advantages of ARs as Dependent Variable. Induced by the negative event, several follow-up events take place, such as firm reaction, endorser reaction, media coverage or changes in advertising spending. These dynamic variables provide capital markets continuously with new information and might therefore affect stock returns beyond the initial event and the firm's responses. Using CARs as dependent variable requires that all other variables describing the follow-up events in this model are aggregated the same way. Hence, cumulating ARs to the window (0, t_2) following the initial event would neglect any daily heterogeneity in stock returns and covariates (e.g., firm reaction, endorser reaction, media coverage, changes in advertising spending) between day t_1 and day t_2. The daily measured covariates might immediately affect stock returns on any point in time during the event window, that is, day $0 \le t \le t_2$. Using CARs in this context would lead to a temporal aggregation bias (Marcellino 1999, Breitung and Swanson 2002), which could severely affect the ability to detect (Granger) causality. If causal mechanisms take place at intervals shorter than the level of temporal aggregation (e.g., firm responds on day 2 of a 20-day event window), the model cannot detect (Granger) causality anymore. Conversely, the model erroneously detects (Granger) causality because temporal aggregation of data induces misleading contemporaneous correlations.

To avoid this temporal aggregation bias, this study uses disaggregate daily data, that is, daily ARs as dependent variable and continuously updated covariates. Thereby, flexibility in modeling improves (see Boehmer et al. 2013, pp. 1393–98). First, the model can account for the temporal order of dynamic follow-up variables by adding dummy variables for each follow-up event. It is straightforward how Equation (2) can be augmented with additional dummy variables which measure other follow-up events such as the endorser apology. Second, the model can easily separate contemporaneous effects (e.g., dummy variable for single reaction day) from delayed effects (e.g., dummy variable for an event window covering multiple post-firm reaction days). Third, the model can easily account for interaction effects of events and third variables (e.g., interaction of firm reaction and changes in advertising spending, effect of delayed firm reaction). Finally, this approach appears to be more robust concerning the influence of outliers. Assuming a firm has an extreme stock return on a single day, this outlier could affect the results much more if using CARs.[6]

Definition of the Event Window. Although most event studies use very short event windows of one to three days around the event (Wiles et al. 2010, Borah and Tellis 2014, Gao et al. 2015), event studies have also examined longer event windows ranging from 5 to 50 postevent days to capture delayed effects and market inefficiencies (Elberse 2007, Tellis and Johnson 2007, Joshi and Hanssens 2009, Hsu et al. 2010, Beber and Pagano 2013, Boehmer et al. 2013). In the context of this study, ARs for the event day are not sufficient to capture the total impact of the negative publicity because (1) some events took several weeks to unfold (Knittel and Stango (2014) examine three trading weeks to capture the whole extent of Tiger Woods' misbehavior) and (2) firm reactions in the sample occurred as late as 20 trading days after the event first became public (no firm reactions occurred after that). Therefore, this study examines a 20-day period (four trading weeks). This enables the model to not only capture the impact of the initial negative event, but more importantly it allows estimating the impact of the corresponding firm reaction, as well as other related events that can take place on a daily basis in the subsequent weeks and might affect ARs, such as endorser reactions, media coverage or changes in advertising spending. Empirically, CARs stabilize around 20 days, suggesting that any relevant follow-up information has been incorporated into stock prices by then (see Figure 2). Thus, the 20-day period can more "accurately capture the entire change in stock prices that can be attributed to the update in expectations caused by the event" (Sorescu et al. 2017, p. 194).

Specification of Models

Three separate regression models test the effects and measure (1) the effects of firms' responses and response timing, (2) the effects of the two response types suspend and maintain, and (3) the interaction effects of the two response types with the four moderating variables:

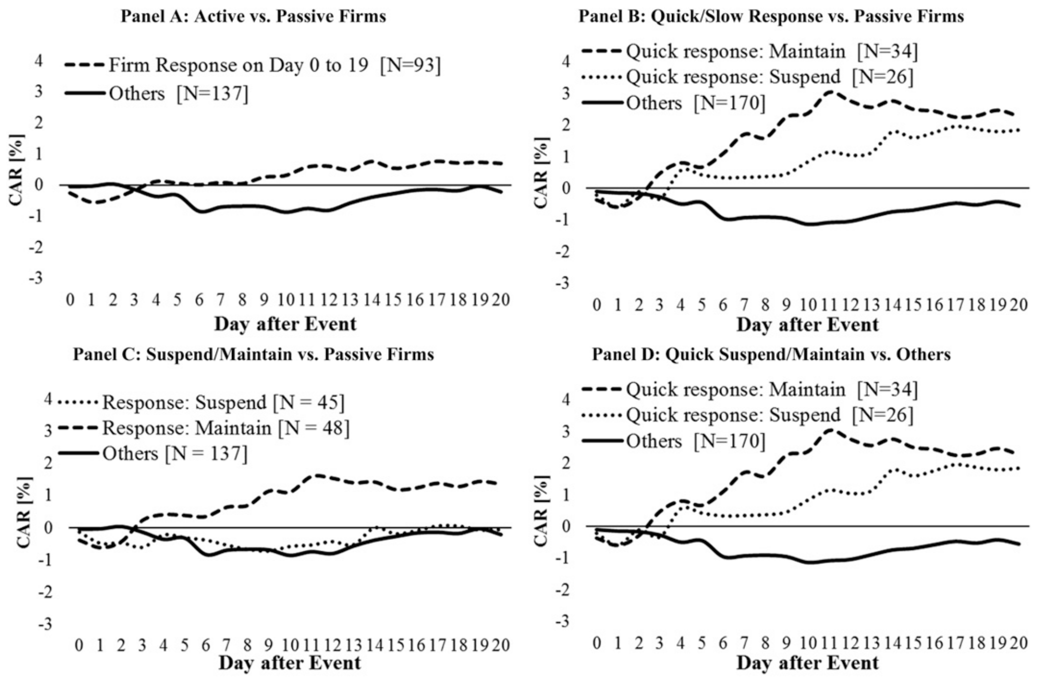
$$\begin{aligned} AR_{i^*e,t} = {} & \beta_0 + \beta_1 \cdot Firm\ Response_{i^*e,t} \\ & + \beta_2 \cdot Firm\ Response_{i^*e,t} * Timing_t \\ & + (Controls) \cdot \gamma + \mu_{i^*e} + \varepsilon_{i^*e,t}; \end{aligned} \tag{3}$$

$$\begin{aligned} AR_{i^*e,t} = {} & \beta_0 + \beta_{3a} \cdot Suspend_{i^*e,t} + \beta_{3b} \cdot Maintain_{i^*e,t} \\ & + \beta_2 \cdot Firm\ Response_{i^*e,t} * Timing_t \\ & + (Controls) \cdot \gamma + \mu_{i^*e} + \varepsilon_{i^*e,t}; \end{aligned} \tag{4}$$

$$\begin{aligned} AR_{i^*e,t} = {} & \beta_0 + \beta_{3a} \cdot Suspend_{i^*e,t} + \beta_{3b} \cdot Maintain_{i^*e,t} \\ & + \beta_{4a} \cdot Suspend_{i^*e,t} * Blame_e + \beta_{4b} \cdot Maintain_{i^*e,t} \\ & * Blame_e + \beta_{5a} \cdot Suspend_{i^*e,t} * Occupation_{i^*e} \\ & + \beta_{5b} \cdot Maintain_{i^*e,t} * Occupation_{i^*e} \\ & + \beta_{6a} \cdot Suspend_{i^*e,t} * Product\ Fit_{i^*e} \\ & + \beta_{6b} \cdot Maintain_{i^*e,t} * Product\ Fit_{i^*e} \\ & + \beta_{7a} \cdot Suspend_{i^*e,t} * E.Apology_{e,t} \\ & + \beta_{7b} \cdot Maintain_{i^*e,t} * E.Apology_{e,t} \\ & + \beta_2 \cdot Firm\ Response_{i^*e,t} * Timing_t \\ & + (Controls) \cdot \gamma + \mu_{i^*e} + \varepsilon_{i^*e,t}. \end{aligned} \tag{5}$$

Dependent variable $AR_{i^*e,t}$ is the abnormal stock return for each firm i and event e on day t before and after the firm reaction. Intercept β_0 measures the

Figure 2. CARs by Firms' Response



average daily AR after the initial negative event becomes public. All models employ within firm and event variation only, because the fixed effect μ_{i*e} controls for time-constant firm and event-specific unobserved variables (Wooldridge 2010).[7] The term $\varepsilon_{i*e,t}$ measures the error associated with firm i and event e on day t. To control for within cluster correlation of error terms and heteroscedasticity, the estimation includes cluster-robust standard errors.[8]

These three models test step-by-step the various main and interaction effects (see Figure 1) to make the presentation and discussion of results more comprehensible. In the first model (Equation (3)), β_1 measures the effect of firm reaction ($Firm\ Response_{i*e,t}$) on the subsequent daily AR. For all subsequent days, $Firm\ Response_{i*e,t}$ is 1 (else 0).[9] If this coefficient is positive, the AR is more positive after the firm's response. To measure the effect of response timing, the model includes the interaction term $Firm\ Response_{i*e,t}{*}Timing_t$. For $Timing_t$ the natural logarithm of *Event Day* controls for a decay in the firm reaction effect (the main effect of *Event Day* is included in the *Controls* vector).[10] If the coefficient β_2 is negative, the impact of firms' response on ARs decreases over time, highlighting the negative effect of a slow reaction after the event.

To test the effects of response type, a second model (Equation (4)) includes two postfirm reaction period dummy variables $Suspend_{i*e,t}$ and $Maintain_{i*e,t}$. The expectation is positive signs for the corresponding coefficients β_{3a} and β_{3b}.

The third model (Equation (5)) is extended by the interaction terms of the two response types $Post\ Suspend_{i*e,t}$ and $Post\ Maintain_{i*e,t}$ with the four moderating variables $Blame_{i*e}$ (level of endorser blame), dummy variable $Occupation_{i*e}$ (value of 1 if the event is related to the occupation of the endorser, else 0), $Product\ Fit_{i*e}$ (level of endorser–product fit), and dummy variable $E.\ Apology_{i*e,t}$ (value of 1 on and after day t if the endorser apologizes, else 0).[11] Note, that the main effect of endorser apology is included in the *Controls*-vector. The other three moderators are time invariant and their respective main effect is not included because it is consumed by fixed effect μ_{i*e}. The coefficients $\beta_{4a/b}$ to $\beta_{7a/b}$ measure the strength of the interaction effects. The expectation is that β_{4a}, β_{5a}, β_{6b}, and β_{7b} have positive signs and that β_{4b}, β_{5b}, β_{6a}, and β_{7a} have negative signs.

The coefficients in vector γ measure the sensitivity of daily ARs to the control variables $\ln(Event\ day)_t$, $Firm\ Response\ (Day\ of)_{i*e,t}$, $Endorser\ Apology_{e,t}$, $Media\ Coverage{:}\ Negative\ Publicity_{i*e,t}$, $Media\ Coverage{:}\ Negative\ Publicity_{i*e,t}{*}Firm\ Response_{i*e,t}$, $Rumor_e{*}Firm\ Response_{i*e,t}$, $Return\ on\ Assets_{i*e}{*}\ Firm\ Response_{i*e,t}$, $Market\text{-}to\text{-}Book\ Ratio_{i*e}{*}Firm\ Response_{i*e,t}$, $\ln(Sales)_{i*e}{*}Firm\ Response_{i*e,t}$, $Leverage_{i*e}{*}Firm\ Response_{i*e,t}$, $Brand_{i*e}{*}\ Firm\ Response_{i*e,t}$, and $Event\ Year_e{*}Post\ Response_{i*e,t}$. For the subsample with available advertising data, the model includes $Advertising\ Spending_{i*e,t}$ and $Advertising\ Spending_{i*e,t}{*}Firm\ Response_{i*e,t}$ as additional controls. The main effects of the time-invariant controls (marked with subscript i^*e or e) are excluded because they are consumed by fixed effect μ_{i^*e}.

Robustness Analysis Strategy

This study subjects all findings to a wide range of alternative models to ensure that the specified models produce unbiased and generalizable point estimates. These alternative models address concerns about the effects of endogeneity bias, outlier bias, and omitted variable bias.

Overview of Potential Biases and Alternative Models. ***Endogeneity Bias.*** A major concern is that firms' response (yes versus no), timing (fast versus slow), and type (maintain versus suspend) do not occur randomly. Event (e.g., blame), firm (e.g., size), and endorser (e.g., product fit) idiosyncrasies can directly affect both firms' response and ARs, thereby clouding the causal effect of the treatment on the outcome. This study uses a Propensity Score Matching (PSM) approach (Cochran and Rubin 1973; Rosenbaum and Rubin 1983, 1985; Rubin 2007; Stuart 2010) to address this concern. In this study, the propensity score is the probability that a firm will react to the negative endorser publicity given the value of the covariates. Online Appendix D outlines all modeling details including results of the probit regressions and tests of balancing properties. Online Appendix E reports additional sensitivity analyses. Results from Rosenbaum Bounds analysis and Instrumental Variables technique suggest that unobserved heterogeneity is unlikely to be a concern.

For the subsample of firms with available advertising spending, an alternative model tests whether a firm's change in advertising spending after the negative event is affected by a self-selection bias. To estimate the direction and magnitude of a potential observable self-selection bias on the test results, this study estimates each model with and without correction for this potential bias.

Outlier Bias. Outliers are extreme or high-leverage observations that can severely bias point estimates in least-squares regression analysis. Cook's distance (Cook's D) identifies these high-leverage points (Cook 1977). Each regression model (see Equations (3)–(5)) is estimated twice, with and without observation i. Cook's D_i measures the sum of changes in the regression model results, that is, the sum of differences between fitted response values for all other observations j. Any observation i is an outlier if Cook's $D_i > 4/N$ (Bollen and Jackman 1990), where N is the original sample size of the model. This multivariate approach is superior to univariate approaches, which exclude single variable outliers although those measurement outliers may not create any bias in the point estimates. If single variable outliers create bias in the point estimates, Cook's D identifies such high leverage observations as well.

Omitted Variable Bias. Including additional explanatory variables moves the theoretical model closer to the true data generating process, which should reduce the omitted variable bias. However, control variables could also increase bias and cause inefficiency if the focal variable and the control variable overlap conceptually or correlate coincidentally (Neumayer and Plümper 2017). The estimation of each model with and without control variables provides insights into the direction and magnitude of a potential omitted variable bias on the test results.

The robustness analysis also controls for the interaction of the above-mentioned biases by considering each possible combination of model setups. As a consequence, the analysis must consider 32 alternative models for each of the three regression models specified above (Table 3). Model 1 is the baseline model. It utilizes the full sample, includes control variables (except *Advertising Spending*, which is only available for a subsample), and does not reweigh observations to correct for self-selection bias. The analysis compares this baseline model with each of the other 31 model alternatives and evaluates whether or not the baseline model findings are robust to any of the biases.

Evaluation of Robustness. Although the evaluation of robustness is important, there is no commonly accepted definition thereof (Neumayer and Plümper 2017). It could require all model alternatives to produce the same results (same sign and magnitude of point estimate and similar standard error). However, it is unclear which of the alternative models might be misspecified. If only one of the 31 alternative models is misspecified and produces biased estimates and standard errors, which overturn the baseline model's findings, this misspecified model would have veto power. Although this rigorous approach is able to reduce type I error, it increases type II error which could also lead to faulty recommendations (Lemons et al. 1997). This study therefore applies two methods which are able to draw inferences from several models without giving a single model veto power (Sala-i-Martin 1997, Neumayer and Plümper 2017).

Model Averaging. Following the suggestion of Sala-i-Martin (1997), this study computes the average point estimate $\beta_\varnothing$ and average standard error $SE_\varnothing$. It uses the unweighted averages and, before averaging, adjusts standard errors for sample size differences. The division of $\beta_\varnothing$ with $SE_\varnothing$ gives a Z-value assumed to follow a normal distribution.

Robustness Coefficient. Neumayer and Plümper (2017, p. 36) introduce a robustness coefficient, which they

Table 3. Overview of Baseline and Alternative Models

Model no.	Sample	Self-selection adjusted	PSM type	Outlier adjusted	Controls	N
1 (Base)	Full	No	—	No	Included	4,830
2	Full	No	—	No	Excluded	4,830
3	Subsample with ad	No	—	No	Included	4,326
4	Subsample with ad	No	—	No	Excluded	4,326
5	Full	No	—	Yes	Included	4,571
6	Full	No	—	Yes	Excluded	4,569
7	Subsample with ad	No	—	Yes	Included	4,093
8	Subsample with ad	No	—	Yes	Excluded	4,091
9	Full	Firms’ response	Kernel	No	Included	4,221
10	Full	Firms’ response	Kernel	No	Excluded	4,221
11	Subsample with ad	Firms’ response	Kernel	No	Included	3,738
12	Subsample with ad	Firms’ response	Kernel	No	Excluded	3,738
13	Subsample with ad	Ad. spending reduction	Kernel	No	Included	4,179
14	Subsample with ad	Ad. spending reduction	Kernel	No	Excluded	4,179
15	Full	Firms’ response	Kernel	Yes	Included	4,040
16	Full	Firms’ response	Kernel	Yes	Excluded	4,047
17	Subsample with ad	Firms’ response	Kernel	Yes	Included	3,510
18	Subsample with ad	Firms’ response	Kernel	Yes	Excluded	3,507
19	Subsample with ad	Ad. spending reduction	Kernel	Yes	Included	3,959
20	Subsample with ad	Ad. spending reduction	Kernel	Yes	Excluded	3,958
21	Full	Firms’ response	1to1	No	Included	3,528
22	Full	Firms’ response	1to1	No	Excluded	3,528
23	Subsample with ad	Firms’ response	1to1	No	Included	3,024
24	Subsample with ad	Firms’ response	1to1	No	Excluded	3,024
25	Subsample with ad	Ad. spending reduction	1to1	No	Included	4,200
26	Subsample with ad	Ad. spending reduction	1to1	No	Excluded	4,200
27	Full	Firms’ response	1to1	Yes	Included	3,377
28	Full	Firms’ response	1to1	Yes	Excluded	3,384
29	Subsample with ad	Firms’ response	1to1	Yes	Included	2,851
30	Subsample with ad	Firms’ response	1to1	Yes	Excluded	2,849
31	Subsample with ad	Ad. spending reduction	1to1	Yes	Included	3,980
32	Subsample with ad	Ad. spending reduction	1to1	Yes	Excluded	3,979

Note. Each model M1 to M32 is estimated three times to test (1) the effects of firm response and timing, (2) the effects of response type (suspend and maintain), and (3) the interaction effects of response type with blame, occupation, product fit, and endorser apology.

define “as the degree to which the baseline model’s estimated effect of interest is supported by another robustness test model that makes a plausible change in model specification.” They operationalize this definition with the robustness coefficient ρ, which is the degree to which the probability density function of the alternative model’s estimate overlaps with the confidence interval (CI) of the baseline model (see Online Appendix F for technical details). The robustness coefficient varies within the interval 0 (lack of robustness) and 1 (strong robustness). For each effect, this study includes a concise graph that displays the estimate, its 95% CI and the robustness coefficient ρ for all 32 tested models. These graphs enable a quick and intuitive interpretation of the effects. This study also reports the average robustness coefficient $\rho_{\varnothing}$ as well as the minimum $\rho_{\min}$.

Results

Descriptive Results and Model-free Evidence

Table 4 shows the average ARs one trading week prior to four trading weeks after the negative publicity surfaces. In line with previous research (Louie et al. 2001, Bartz et al. 2013), the financial markets do not seem to anticipate the negative publicity but interpret it as a threat to future earnings, indicated by a drop in stock returns on the event day (−0.16%; $p < 0.01$ for Patell Z and $p < 0.10$ for standardized cross-sectional test). Furthermore, this analysis finds negative ARs for additional days after the event, including day 6 (−0.28%; $p < 0.01$ for Patell Z and $p < 0.10$ for standardized cross-sectional test) and day 10 (−0.13%; $p < 0.10$ for Patell Z and standardized cross-sectional test). This finding provides further support for extending the time window. Over the next four trading weeks (0, 20), firms are, on average, able to recover from the negative event (−0.03%; $p > 0.10$).

Figure 2 shows CARs (0, 20) for the different groups. Panel a shows that active firms only tend to outperform passive ones ($M_{\text{active}} = 0.68\%$, SD = 7.21%, $n = 93$; $M_{\text{passive}} = -0.22\%$, SD = 7.50%, $n = 137$; $F(1, 228) = 0.363$, $p > 0.10$). However, panel b provides visual support that particularly quick responses send a positive signal to the stock market. Firms that react quickly (days 0–2)[12] significantly outperform firms that react slowly (days 3–19; $M_{\text{quick response}} = 2.10\%$,

Table 4. Abnormal Returns

Day	Mean AR (%)	Patell Z	SDCsect Z
−5	0.00	−0.494	−0.488
−4	0.13	1.221	0.780
−3	−0.05	0.957	0.610
−2	0.15	−0.362	0.661
−1	0.12	1.617***	0.929
0	−0.16	−2.473**	−1.556***
1	−0.07	−1.153	−0.472
2	0.10	0.957	0.429
3	0.02	−0.23	−0.299
4	−0.04	0.43	−0.342
5	0.01	−0.626	−0.530
6	−0.28	−2.605**	−2.072***
7	0.11	−0.89	0.347
8	0.01	−0.758	0.261
9	0.06	0.43	−0.044
10	−0.13	−1.549***	−1.390***
11	0.16	0.826	1.322***
12	−0.03	0.034	−0.432
13	0.05	−0.494	−0.158
14	0.22	1.221	1.270
15	−0.05	−1.549***	−0.014
16	0.04	0.43	0.749
17	−0.01	1.353***	0.326
18	0.01	−0.362	0.522
19	0.10	0.166	0.670
20	−0.14	−1.285***	−1.092
(0,+1)	−0.23	−3.132**	−1.355***
(0,+5)	−0.14	−1.285***	−1.165
(0,+10)	−0.38	−0.098	−1.691*
(0,+15)	−0.02	−0.758	−0.974
(0,+20)	−0.03	−0.23	−0.541
(1,+20)	0.13	−0.23	−0.192

Notes. Previous studies have shown that methods based on standardized ARs have been outperforming those based on nonstandardized returns. The most widely used standardized methods are the Patell (1976) *t*-statistic and its extension and the Boehmer et al. (1991) (BMP) *t*-statistic, also known as the standardized cross-sectional test (SDCsect). This table presents both.

*$p < 0.05$; **$p < 0.01$; ***$p < 0.10$.

SD = 7.48%, n = 60; $M_{\text{slow response}} = -1.88\%$, SD = 5.99%, $n = 33$; $F(2, 227) = 3.590$, $p < 0.05$). Passive firms ($M_{\text{passive}} = -0.22\%$, SD = 7.50%, $n = 137$) do not differ significantly from quick and slow firms ($p > 0.10$). Panel c suggests that maintaining the endorser (M_{maintain} = 1.37%, SD = 8.31%, n = 48) sends a more positive signal to the stock market than suspending the endorser ($M_{\text{suspend}} = -0.04\%$, SD = 5.82%, $n = 45$) or not reacting at all ($M_{\text{other}} = -0.22\%$, SD = 7.50%, $n = 137$), but groups do not differ significantly $F(2, 227) = 0.840$, $p > 0.10$). However, panel d provides some evidence that both suspending ($M_{\text{quick+suspend}}$ = 1.86%, SD = 8.34%, $n = 26$) and maintaining the endorser quickly ($M_{\text{quick+maintain}}$ = 2.28%, SD = 6.33%, $n = 34$) send a more positive signal to the stock market than responding slowly or not at all ($M_{\text{other}} = -0.54\%$, SD = 7.24%, n = 170; $F(2, 227) = 2.910$, $p < 0.10$).

Econometric Results and Interpretation

Baseline Models. Table 5 shows the descriptive statistics and bivariate correlations of the model variables. Columns (1)–(3) in Table 6 show the estimates, standard errors, and p-values of the three baseline models as specified in Equations (3)–(5). All three models explain a significant proportion of the AR variance (F-statistics are significant with $p < 0.001$). R^2 of the three models ranges between 0.054 and 0.058, which is in line with explained variances of other event studies (e.g., Borah and Tellis 2014, Oxley et al. 2009). In Table 6, model (1) tests firms' response (yes versus no) and timing (slow versus fast), model (2) response type (suspend and maintain versus no response), and model (3) the moderating factors blame (high versus low), occupation (related versus not), product fit (high versus low), and endorser response (apology versus not).

Robustness Analysis Findings. As outlined previously, the analysis uses the baseline model and 31 alternative models to draw inferential conclusions (Table 3). Online Appendix H shows the coefficients and standard errors of all 32 regression models used subsequently. Table 7 presents the aggregated findings. For each effect, this table lists the

1. Percentage of models that produce the expected sign of estimate,
2. Percentage of models that produce the expected sign of estimate being significant at $p < 0.05$,
3. Average estimate ($\beta_{\varnothing}$),
4. Average standard error ($SE_{\varnothing}$),
5. p-Value of the significance test using the average estimate and standard error ($p_{\varnothing}$),
6. Average robustness coefficient ($\rho_{\varnothing}$),
7. Minimum robustness coefficient ($\rho_{\min}$), and
8. Decision whether there is robust support for a significant effect (✓) or not (✗).

For visual support and ease of interpretation, Figures 3 and 4 show for each effect and for each of the 32 models the estimates (bold black slash), their 95% CIs (black vertical line), and the robustness coefficients ρ (gray bars).

Effects of Firm Behavior. ***Firms' Response Announcement.*** The first model (column (1) in Table 6) produces a coefficient of 0.681 (SE = 0.263; p = 0.011) for firms' response, which means that daily ARs are, all else equal and on average, 0.681% more positive after the announcement. One hundred percent of the 32 alternative models produce positive coefficient estimates that are significantly different from zero at a 95% CI (see upper-left chart in Figure 3 and Table 7). On average, the robustness coefficient ρ is 0.967; that is, the confidence is 96.7% that the alternative model estimates and the baseline coefficient estimates are

Table 5. Descriptives and Correlations for Baseline Model M1

No.	Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
1	*Abnormal Return*	1																										
2	*Firm Response*	0.036	1																									
3	*Response*Timing*	0.027	0.961	1																								
4	*Response: Suspend*	0.012	0.615	0.603	1																							
5	*Response: Maintain*	0.034	0.651	0.615	−0.198	1																						
6	*Blame* Suspend*	0.012	0.611	0.600	0.993	−0.197	1																					
7	*Blame* Maintain*	0.031	0.633	0.602	−0.193	0.973	−0.191	1																				
8	*Occup.* Suspend*	0.008	0.311	0.297	0.506	−0.100	0.461	−0.098	1																			
9	*Occup.* Maintain*	0.016	0.419	0.386	−0.128	0.644	−0.127	0.570	−0.065	1																		
10	*Prod. Fit* Suspend*	0.006	0.417	0.405	0.678	−0.134	0.666	−0.131	0.482	−0.086	1																	
11	*Prod. Fit* Maintain*	0.029	0.522	0.495	−0.159	0.801	−0.158	0.778	−0.080	0.528	−0.108	1																
12	*E. Resp.: Apol.* Susp.*	−0.003	0.367	0.371	0.596	−0.118	0.618	−0.115	0.382	−0.076	0.287	−0.095	1															
13	*E. Resp.: Apol.* Maint.*	0.023	0.245	0.235	−0.074	0.376	−0.074	0.376	−0.038	0.036	−0.050	0.278	−0.044	1														
14	ln(*Eventday*)	0.024	0.207	0.311	0.145	0.118	0.146	0.122	0.062	0.062	0.093	0.098	0.103	0.050	1													
15	*Firm Resp. (Day of)*	−0.021	−0.100	−0.096	−0.061	−0.065	−0.061	−0.063	−0.031	−0.042	−0.042	−0.052	−0.037	−0.024	−0.209	1												
16	*End. Resp.: Apology*	−0.007	0.084	0.091	0.176	−0.065	0.190	−0.059	0.135	−0.124	0.051	−0.062	0.478	0.319	0.091	−0.002	1											
17	*Neg. Publicity*	−0.010	0.077	0.038	0.099	0.000	0.104	0.012	0.014	0.005	0.073	−0.021	0.039	0.035	−0.264	0.153	0.019	1										
18	*Neg. Publicity*Resp.*	0.025	0.382	0.311	0.317	0.170	0.322	0.184	0.104	0.117	0.223	0.102	0.157	0.118	−0.004	−0.038	0.052	0.570	1									
19	*Rumor*Response*	0.006	0.180	0.194	0.009	0.215	0.015	0.239	−0.028	−0.037	0.032	0.174	−0.033	−0.022	0.068	−0.018	−0.068	0.026	0.088	1								
20	*ROA*Response*	0.018	0.443	0.431	0.352	0.212	0.352	0.178	0.171	0.012	0.185	0.116	0.188	0.018	0.099	−0.044	0.015	0.020	0.147	0.051	1							
21	*MTBR*Response*	0.024	0.598	0.580	0.346	0.410	0.346	0.419	0.178	0.173	0.177	0.339	0.220	0.125	0.132	-0.060	0.042	0.038	0.216	0.109	0.479	1						
22	ln(*Sales*)*Response*	0.037	0.988	0.951	0.611	0.641	0.609	0.628	0.325	0.401	0.404	0.509	0.391	0.244	0.207	−0.098	0.100	0.077	0.378	0.167	0.420	0.585	1					
23	*Leverage*Response*	0.030	0.934	0.897	0.606	0.578	0.597	0.571	0.336	0.349	0.400	0.412	0.404	0.161	0.193	−0.093	0.087	0.084	0.376	0.193	0.369	0.532	0.929	1				
24	*Brand*Response*	0.014	0.507	0.483	0.286	0.354	0.299	0.327	0.082	0.327	0.211	0.303	0.247	0.009	0.098	−0.051	0.032	0.045	0.202	−0.045	0.285	0.217	0.507	0.474	1			
25	*Event Year*Response*	0.036	1.000	0.961	0.617	0.650	0.613	0.632	0.311	0.418	0.417	0.521	0.368	0.245	0.207	−0.100	0.084	0.077	0.383	0.180	0.442	0.597	0.988	0.934	0.507	1		
26	*Advertising Spending*	0.025	0.054	0.047	0.029	0.041	0.029	0.032	0.080	0.047	0.033	0.063	0.056	−0.001	0.008	0.009	0.115	−0.033	−0.040	−0.023	0.004	−0.034	0.071	0.039	0.027	0.054	1	
27	*Ad. Spending*Resp.*	0.032	0.954	0.917	0.635	0.588	0.633	0.573	0.327	0.361	0.424	0.488	0.420	0.255	0.193	−0.085	0.141	0.055	0.344	0.164	0.364	0.507	0.953	0.880	0.483	0.954	0.193	1
	Mean	0.01	0.33	0.79	0.16	0.17	0.97	0.95	0.05	0.08	4.90	6.60	0.06	0.03	2.16	0.02	0.23	0.15	0.06	0.02	0.02	1.22	3.16	0.20	0.11	663.80	0.67	0.21
	SD	1.68	0.47	1.17	0.36	0.38	2.25	2.14	0.21	0.27	16.70	18.00	0.24	0.17	0.80	0.14	0.42	0.36	0.23	0.12	0.06	2.91	4.55	0.30	0.32	944.10	0.21	0.33
	Min	−15.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	−37.70	−13.80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	−0.43	−9.90	0.00	0.00	0.00	0.00	0.00	0.00
	Max	19.30	1.00	3.04	1.00	1.00	6.93	6.75	1.00	1.00	86.00	82.20	1.00	1.00	3.04	1.00	1.00	3.22	2.08	1.00	0.33	22.50	12.90	1.37	1.00	2016	1.58	1.12

Note. $|r| > 0.046$ significant at 0.1% level; $|r| > 0.038$ significant at the 1% level; $|r| > 0.028$ significant at 5% level; $|r| > 0.024$ significant at the 10% level.

Table 6. Results for Baseline Model M1

		Dependent variable: *Abnormal stock return*								
		(1) *Firm response and response timing*			(2) *Response type: Suspend/ maintain*			(3) *Response type: Moderation effects*		
	Expected sign	Coefficient	SE	*p*	Coefficient	SE	*p*	Coefficient	SE	*p*
Event's main effect (intercept)	(–)	**–0.122**$^{\$}$	0.073	0.098	**–0.118**	0.074	0.111	**–0.103**	0.067	0.130
Main effects										
Firm response	(+)	**0.681***	0.263	0.011						
*Response*Timing (slow vs. fast)*	(–)	**–0.184***	0.087	0.036	**–0.184***	0.087	0.036	**–0.168***	0.085	0.050
Response type: Suspend	(+)				**0.756***	0.309	0.016	**0.247**	0.331	0.458
Response type: Maintain	(+)				**0.564**$^{\$}$	0.297	0.060	**0.831***	0.359	0.022
Moderation effects										
*Blame*Suspend*	(+)							**0.875****	0.302	0.004
*Blame*Maintain*	(–)							**–0.116**	0.144	0.421
*Occupation*Suspend*	(+)							**0.863***	0.417	0.040
*Occupation*Maintain*	(–)							**–0.662***	0.287	0.022
*Product Fit*Suspend*	(–)							**–0.319***	0.141	0.026
*Product Fit*Maintain*	(–)							**0.351***	0.176	0.048
*Endorser apology*Suspend*	(–)							**–0.459***	0.229	0.047
Endorser apology Maintain*	(+)							**0.016**	0.419	0.969
Controls										
ln(*Event day*)		**0.037**	0.033	0.262	**0.038**	0.033	0.255	**0.034**	0.034	0.314
Firms' response (day of)		**–0.089**	0.190	0.639	**–0.097**	0.192	0.616	**–0.146**	0.188	0.437
Endorsers' response: Apology (vs. not)		**0.065**	0.136	0.636	**0.055**	0.136	0.688	**0.136**	0.160	0.398
Media coverage: Negative publicity		**–0.073***	0.031	0.021	**–0.072***	0.031	0.020	**–0.087****	0.031	0.006
*Media cov.: Neg. publicity*Response*		**0.059**	0.044	0.182	**0.058**	0.043	0.183	**0.075**$^{\$}$	0.044	0.087
*Rumor*Response*		**0.194**	0.487	0.691	**0.246**	0.489	0.616	**–0.005**	0.541	0.992
*Return on assets*Response*		**–0.430****	0.147	0.004	**–0.452****	0.152	0.004	**–0.500****	0.177	0.005
*Market-to-book ratio*Response*		**1.136****	0.353	0.002	**1.157*****	0.343	0.001	**1.074****	0.376	0.005
ln(*sales*)*Response*		**0.535*****	0.154	0.001	**0.531*****	0.149	0.001	**0.478****	0.143	0.001
*Leverage*Response*		**–0.514****	0.168	0.003	**–0.542****	0.176	0.002	**–0.448***	0.195	0.023
*Brand*Response*		**–0.279**	0.238	0.243	**–0.259**	0.236	0.275	**–0.485***	0.235	0.041
*Event Year*Response*		**–0.164**	0.126	0.194	**–0.209**	0.159	0.191	**–0.220**	0.134	0.102
*Firm*Event fixed effects*			Yes			Yes			Yes	
Model fit										
F-value			3.578***			4.019***			4.637***	
R^2			0.054			0.054			0.058	
N			4,830			4,830			4,830	

Note. Coefficients are displayed in bold for ease of processing.
*$p < 0.05$; **$p < 0.01$; ***$p < 0.001$; $^{\$}p < 0.10$ (based on cluster-robust standard errors).

similar (Table 7). Even for the most different alternative model, confidence is still 88.4% that the two coefficients are the same (Table 7). Across all 32 models, the average effect size estimate is 0.611 (SE = 0.211; $p = 0.004$).

This finding provides strong evidence that only active firms have the power to reduce information asymmetry and investors' initial overreaction (Fiske 1980; Kahneman and Tversky 1982; De Bondt and Thaler 1985, 1987), thereby avoiding the negative spillover effects. Active firms demonstrate that they are aware of potential reputational risks and are willing and able to minimize the threat to future earnings. The empirical evidence clearly shows that daily ARs are, all else equal, 0.681% (baseline model) more positive the day after the firm's response announcement. However, the "window of opportunity" is quite small because this positive effect diminishes quickly on the following days:

Response Timing. ARs are, on average, 0.184% more negative if firms delay announcements (SE = 0.087, $p = 0.036$; column (1) in Table 6). The effect is negative in 100% and significantly different from zero in 78.1% of the alternative models ($\beta_{\varnothing} = -0.173$, $SE_{\varnothing} = 0.076$, $p_{\varnothing} = 0.023$; $\rho_{\varnothing} = 0.961$, $\rho_{\min} = 0.884$; Table 7).

Slow (fast) firm responses send a more negative (positive) signal to the stock market, because information asymmetry, level of uncertainty, and media scrutiny are the highest at the onset of negative events (Bundy and Pfarrer 2015). In such an environment, a quick response is beneficial (Eagly et al. 1978, Archer and Burleson 1980, Grunig et al. 1992). Positive effects of a firm's response on the daily ARs are diminished

Table 7. Overview of Results

Effect	Expected sign	Percentage of β with expected sign					Robustness		Robust support of significant effect
		Total	$p < 0.05$	$\beta_{\varnothing}$	$SE_{\varnothing}$	$p_{\varnothing}$	$\rho_{\varnothing}$	$\rho_{\min}$	
Firms' response (yes vs. no)	(+)	100.0%	100.0%	0.611	0.211	0.004	0.967	0.884	✓
Timing (slow vs. fast)	(–)	100.0%	78.1%	–0.173	0.076	0.023	0.961	0.884	✓
Response type: Suspend	(+)	100.0%	93.8%	0.613	0.238	0.010	0.956	0.818	✓
Response type: Maintain	(+)	100.0%	65.6%	0.563	0.236	0.017	0.946	0.773	✓
Suspend*Blame	(+)	100.0%	71.9%	0.543	0.217	0.012	0.854	0.327	✓
Maintain*Blame	(–)	43.8%	0.0%	0.030	0.135	0.824	0.766	0.132	✗
Suspend*Occupation	(+)	100.0%	65.6%	0.773	0.301	0.010	0.951	0.778	✓
Maintain*Occupation	(–)	100.0%	75.0%	–0.590	0.261	0.024	0.929	0.745	✓
Suspend*Product fit	(–)	100.0%	93.8%	–0.259	0.091	0.005	0.976	0.919	✓
Maintain*Product fit	(+)	100.0%	62.5%	0.332	0.151	0.028	0.942	0.747	✓
Suspend*Endorser apology	(–)	100.0%	93.8%	–0.544	0.163	0.001	0.975	0.908	✓
Maintain*Endorser apology	(+)	62.5%	6.3%	0.184	0.308	0.550	0.918	0.651	✗

Notes. Average coefficients, average standard errors, overall p-value, average and minimum robustness ρ based on estimates of baseline model M1 and alternative models M2 to M32. $p_{\varnothing}$ is based on the t-value (~$N(0;1)$) calculated by the ratio of the unweighted average of regression coefficients and standard errors of M1 to M32 (Sala-i-Martin 1997). Standard errors of M1 to M32 are adjusted for sample size differences. Average (minimum) robustness ρ measures the average (minimum) share of the probability density distributions of the robustness test estimated effects that lie within the 95% CI of the baseline model effect (Neumayer and Plümper 2017). Thus, ρ ranges from 0 (lack of robustness) to 1 (strong robustness).

by −0.184% if the firm responds slowly, and this diminishing effect becomes increasingly more negative with each day the firm does not respond. The window of opportunity closes after about three days after the event, and the firm response becomes ineffective afterward. A slow response is not only inferior to a quick response but also to passive firms (Figure 2b: −1.88% versus −0.22%). The most surprising finding is that firms can even gain in value if their response is announced within 72 hours after the event became public. Over the four trading weeks following the negative publicity, these firms gain, on average, 2.10% in value (Figure 2b). These positive effects also hold for different types of firm responses:

Response Type: Suspend. ARs are, on average, 0.756% more positive after suspending the endorser (versus no firm response; SE = 0.309, $p = 0.016$; column (2) in Table 6). The effect is positive in 100% and significantly different from zero in 93.8% of the alternative models ($\beta_{\varnothing} = 0.613$, $SE_{\varnothing} = 0.238$, $p_{\varnothing} = 0.010$; $\rho_{\varnothing} = 0.956$, $\rho_{\min} = 0.818$; Table 7). Suspending an endorser sends a more positive signal to the stock market than not responding at all.

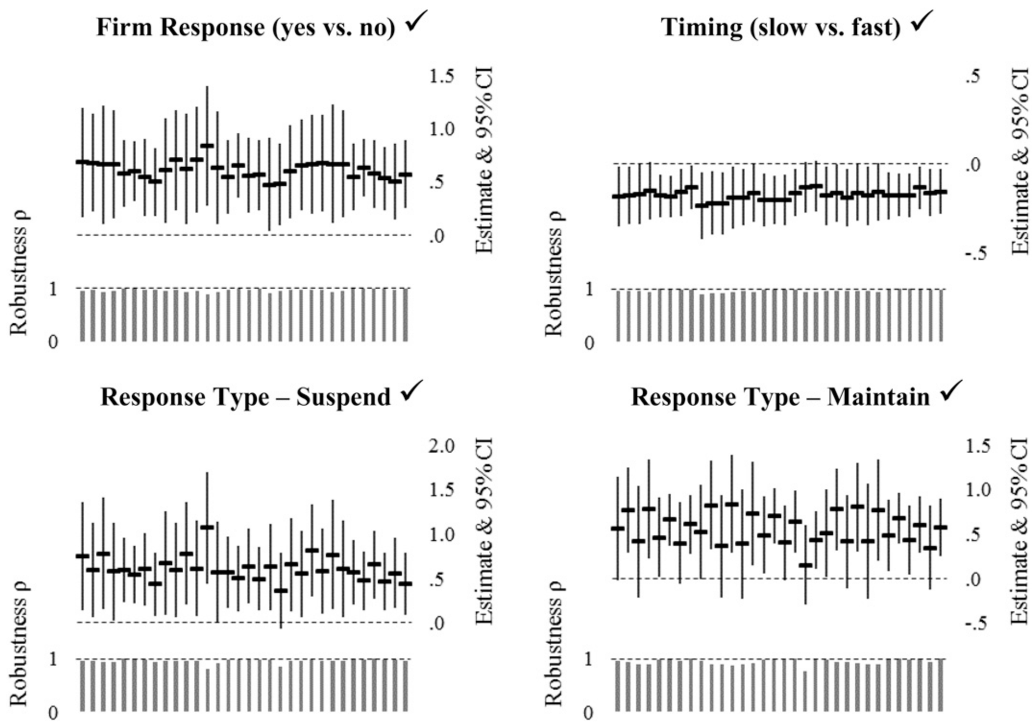
Response Type: Maintain. ARs are, on average, 0.564% more positive after maintaining the endorser (versus no firm response; SE = 0.297, $p = 0.060$; column (2) in Table 6). The effect is positive in 100% and significantly different from zero in 65.6% of the alternative models ($\beta_{\varnothing} = 0.563$, $SE_{\varnothing} = 0.236$, $p_{\varnothing} = 0.017$; $\rho_{\varnothing} = 0.946$, $\rho_{\min} = 0.773$; Table 7). Maintaining an endorser sends a more positive signal to the stock market than not responding at all.

Therefore, issuing statements suspending or maintaining the endorser both yield more positive ARs than not reacting at all. The effects are 0.756% (suspend) and 0.564% (maintain) on the day after the response announcement. Consequently, these firms outperform passive firms in the weeks following the event, but only if they respond quickly. CARs are, on average, 1.86% (suspend quickly) and 2.28% (maintain quickly), respectively (Figure 2d). However, the decision to suspend or maintain the endorser should not be arbitrary, but account for the following contextual factors:

Moderating Effects. ***Blame.*** The third model (column (3) in Table 6) produces coefficients of 0.875 (SE = 0.302; $p = 0.004$) for the interaction with suspending and −0.116 (SE = 0.144; $p = 0.421$) for the interaction with maintaining. Figure 5 (upper-left chart) offers visual support for interpretation of the effects. Announcements of suspending a higher (lower) blame endorser send a positive (negative) signal to the stock market. The coefficient is positive in 100% and significantly different from zero in 71.9% of the alternative models ($\beta_{\varnothing} = 0.543$, $SE_{\varnothing} = 0.217$, $p_{\varnothing} = 0.012$; $\rho_{\varnothing} = 0.854$, $\rho_{\min} = 0.327$; Table 7).[13] For maintaining, however, there is no significant difference between higher- and lower-blame endorsers ($\beta_{\varnothing} = 0.030$, $SE_{\varnothing} = 0.135$, $p_{\varnothing} = 0.824$; $\rho_{\varnothing} = 0.766$, $\rho_{\min} = 0.132$; Table 7). The coefficient is negative in only 43.8% and significantly different from zero in 0% of the alternative models.

Previous research suggests that level of endorser blame is an important factor that influences consumer perceptions of firms' response (Louie and Obermiller 2002). A new and surprising finding of this study is that investors seem to only take blame into consideration

Figure 3. Robustness Analysis Results



Notes. Each of the four cells shows two graphs with the results for the baseline model M1 and alternative models M2 to M32 (dependent variable: AR). Upper graphs: Estimates are represented as bold black slash, and their 95% CIs are represented as a black vertical line. Right axis shows the scale. Lower graphs: Gray bars represent the robustness ρ, which measures the share of the probability density distribution of the robustness test estimated effect that lies within the 95% CI of the baseline model effect. Here ρ ranges from 0 (lack of robustness) to 1 (strong robustness) (left axis).

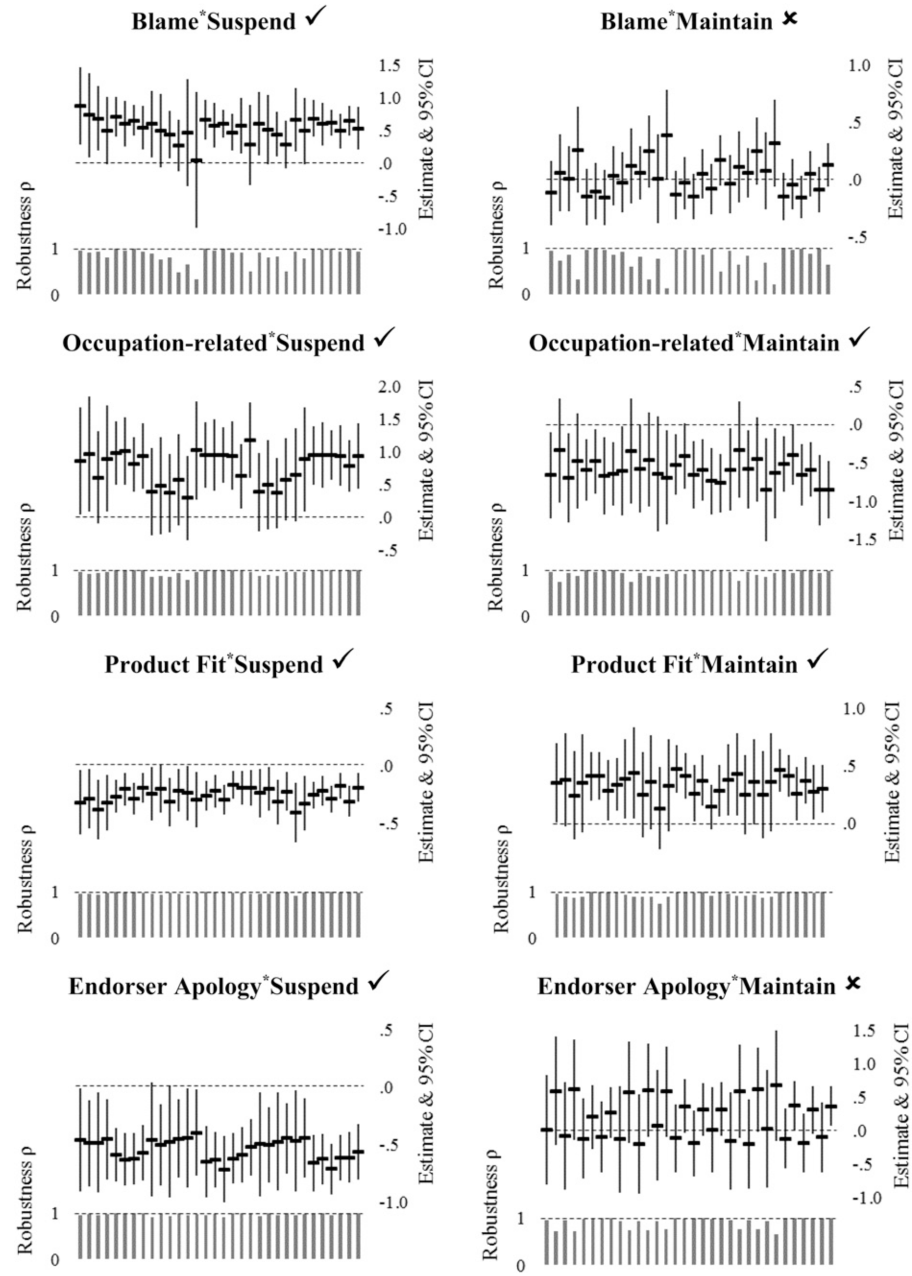
when firms decide to suspend their endorser, but not if they decide to maintain him/her. Investors respond more negatively to a suspension the lower the blame is because lower blame implies a lower risk of negative spillovers, which would make the suspension an unnecessary overreaction. As blame increases, investors respond more favorably to a suspension, because the firm avoids the higher risk of negative spillovers. However, there are at least two reasons why firms should refrain from always maintaining the endorser regardless of blame. First, at very high levels of blame, announcements of suspending perform better than announcements of maintaining (see Figure 5, upper-left chart). Second, firms would neglect the following factors.

Occupation. The third model (column (3) in Table 6) produces coefficients of 0.863 (SE = 0.417, $p = 0.040$) for the interaction with suspending and −0.662 (SE = 0.287, $p = 0.022$) for the interaction with maintaining. Figure 5 (upper-right chart) offers visual support. Announcements of suspending an endorser whose negative publicity is (not) related to his or her occupation send a positive (negative) signal to the stock market. The coefficient is positive in 100% and significantly different from zero in 65.6% of the alternative models ($\beta_{\varnothing} = 0.773$, $SE_{\varnothing} = 0.301$, $p_{\varnothing} = 0.010$, $\rho_{\varnothing} = 0.951$, $\rho_{\min} = 0.778$; Table 7). Announcements of maintaining an endorser whose negative publicity is (not) related to his/her occupation send a negative (positive) signal to the stock market. The coefficient is negative in 100% and significantly different from zero in 75% of the alternative models ($\beta_{\varnothing} = -0.590$, $SE_{\varnothing} = 0.261$, $p_{\varnothing} = 0.024$; $\rho_{\varnothing} = 0.929$, $\rho_{min} = 0.745$; Table 7).

These interactions emphasize the importance of endorsers' expertise and/or performance (e.g., Ohanian 1990, Till and Busler 2000) and how important these perceptions are for appropriate firm responses. The stock market responds more positively to a suspension of a celebrity whose misbehavior is related to his/her occupation (e.g., a positive doping test of an athlete), because the event poses a direct threat to these perceptions. Maintaining the endorser is more beneficial if the misbehavior is not related to the occupation of the endorser, and does not affect his/her expertise and/or performance.

Product Fit. The third model (column (3) in Table 6) produces coefficients of −0.319 (SE = 0.141, $p = 0.026$) for the interaction with suspending and 0.351 (SE = 0.176, $p = 0.048$) for the interaction with maintaining. Figure 5 (lower-left chart) offers visual support. Announcements of suspending a low (high) fit endorser send a positive (negative) signal to the stock market. The coefficient is negative in 100% and significantly

Figure 4. Robustness Analysis Results for Moderation Effects

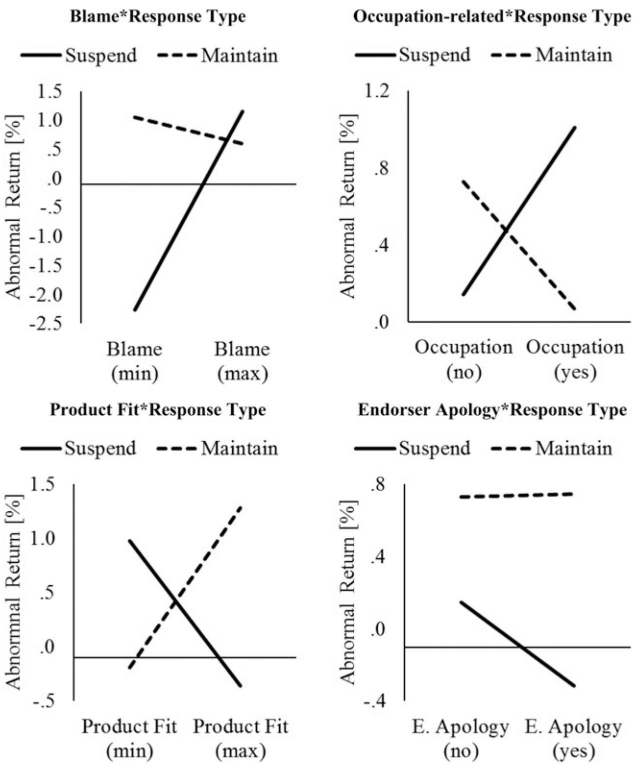


Notes. Each of the eight cells shows two graphs with the results for the baseline model M1 and alternative models M2 to M32 (dependent variable: AR). Upper graphs: Estimates are represented as bold black slash, and their 95% CIs are represented as a black vertical line. Right axis shows the scale. Lower graphs: Gray bars represent the robustness ρ, which measures the share of the probability density distribution of the robustness test estimated effect that lies within the 95% CI of the baseline model effect. Here ρ ranges from 0 (lack of robustness) to 1 (strong robustness) (left axis).

different from zero in 93.8% of the alternative models ($\beta_{\varnothing} = -0.259$, $SE_{\varnothing} = 0.091$, $p_{\varnothing} = 0.005$, $\rho_{\varnothing} = 0.976$, $\rho_{min} = 0.919$; Table 7). Announcements of maintaining a low (high) fit endorser send a negative (positive) signal to the stock market. The coefficient is positive in 100% and significantly different from zero in 62.5% of the alternative models ($\beta_{\varnothing} = 0.332$, $SE_{\varnothing} = 0.151$, $p_{\varnothing} = 0.028$, $\rho_{\varnothing} = 0.942$, $\rho_{\min} = 0.747$; Table 7).

These significant coefficients confirm the importance of the endorser–product fit (Kamins 1990, Misra and Beatty 1990, Kamins and Gupta 1994), which, in turn, influences how investors evaluate announcements of firm reactions to endorser misbehavior. The stock market responds more negatively to a suspension of a high endorser–product fit because the firm abandons a hitherto beneficial relationship. However, this finding

Figure 5. Interaction Plots for Moderation Effects



Note. Interaction plots based on results for baseline model M1.

does not imply that firms should always maintain a misbehaving endorser with a high product fit because stock markets respond negatively if, for example, this misbehavior is occupation-related (see above). Maintaining an endorser with a low product fit is also not advisable because the expected economic benefits of the future collaboration do not outweigh the risk of negative spillover effects.

Endorser Apology. The third model (column (3) in Table 6) produces coefficients of −0.459 (SE = 0.229, p = 0.047) for the interaction with suspending and 0.016 (SE = 0.419, p = 0.969) for the interaction with maintaining. Figure 5 (lower-right chart) offers visual support. Announcements of suspending a nonapologetic (apologetic) endorser send a positive (negative) signal to the stock market. The coefficient is negative in 100% and significantly different from zero in 93.8% of the alternative models ($\beta_{\varnothing} = -0.544$, $SE_{\varnothing} = 0.163$, $p_{\varnothing} = 0.001$, $\rho_{\varnothing} = 0.975$, $\rho_{\min} = 0.908$; Table 7). For maintaining, however, there is no significant difference between nonapologetic and apologetic endorsers ($\beta_{\varnothing} = 0.184$, $SE_{\varnothing} = 0.308$, $p_{\varnothing} = 0.550$, $\rho_{\varnothing} = 0.918$, $\rho_{\min} = 0.651$; Table 7). The coefficient is positive in 62.5% and significantly different from zero in only 6.3% of the alternative models.

Previous research suggests that apologies can help endorsers to maintain their image and trustworthiness after misbehavior (Carrillat et al. 2013, Thomas and Fowler 2016). A new and surprising finding is that investors seem to only take endorsers' reactions into consideration when firms decide to suspend their endorsers, but not if they decide to maintain him/her. Investors respond more negatively to the announcement of suspending an apologetic endorser, because the firm creates perceptions of overreaction, which endangers future returns on investment into their endorser. On the contrary, stock markets reward firms that suspend nonapologetic endorsers, because these firms counteract the negative spillovers caused by the endorser who is jeopardizing his/her trustworthiness. A firm's announcement to maintain a nonapologetic endorser is a diagnostic (and positive) signal, which can eliminate investors' concerns about the endorser's ability to further contribute to the marketing performance of the firm and therefore renders the endorser's (non)apology less important.

In sum, the analysis of the various moderating variables provides the first empirical evidence that firms can have more positive ARs when they (1) suspend (versus maintain) high-blame endorsers, (2) suspend (versus maintain) endorsers whose negative publicity is related to their occupation, (3) maintain (versus suspend) endorsers with a high product fit, and (4) do not suspend (versus suspend) apologetic endorsers. Figure 5 displays the moderators' relative importance. Endorser blame is the most important moderator (the range of ARs between the best- and worst-case scenario is 3.41%), followed by product fit (range 1.64%), endorser apology (range 1.06%), and occupation (range 0.94%).

The analysis also reveals that there is not a single scenario in which firms are better off without a response. Figure 5 shows that firms can always find a response that produces ARs above the zero line of nonresponse. However, if firms show the wrong response, the outcome is worse than remaining silent. For instance, if the firm suspends a lower blame endorser, ARs are very negative. To avoid such risks, firms should observe these moderators before they make a decision.

Effects of Control Variables. There are also five control variables that have significant effects across the three baseline models. Standardization of these variables allows us to compare their effect sizes. This discussion lists them in order of effect size magnitude. First, the positive coefficients for *Market-to-Book Ratio* indicate that the stock market seems to hold firms with a high growth potential to a higher standard. Therefore, it is particularly important for these firms to respond to the negative publicity. Second, large firms are much more likely to receive more attention (Fang and Peress 2009). The positive coefficients for ln(*Sales*) indicate that it is particularly important for large firms to respond to the negative publicity before the media coverage will turn it into a downward spiral. Third, negative coefficients for *Leverage* indicate that, surprisingly, the stock market punishes firms with a high debt ratio if they respond to the negative publicity. Fourth, negative coefficients for ROA indicate that, surprisingly, the stock market punishes firms with a good financial and operational performance if they respond to the negative publicity. Fifth, the negative coefficients for *Media Coverage: Negative Publicity* indicate that the amount of media coverage of the event negatively affects ARs.

Additional Robustness Analyses

A firm's reaction might depend on the reaction of competing firms employing the same celebrity. Thus, instead of considering the reacting in isolation, this study also considers the reaction relative to other firms using the same celebrity. The data set includes 13 events ($n = 51$ observations) where a celebrity was endorsing more than one firm and at least one of the firms showed a diverging response to the same negative event. This subsample is consequently homogeneous concerning any unmeasured celebrity and event characteristics. The subsample analysis confirms the findings reported so far, with two exceptions: (1) results support the interaction *Endorser Apology*Maintain*, which was not supported by the baseline model, and (2) results do not provide support for the interaction *Product Fit*Maintain*, which was supported by the baseline model. The confidence is higher than 90% that 8 of 11 tested effects in the subsample replicate the full sample's estimates (robustness coefficients > 0.90; see Online Appendix I).

For another robustness analysis, all lower-blame events ($n = 15$) that ranked below 4 on the 7-point blame scale are excluded.[14] The findings for these analyses do not change any of the findings for the full sample analysis reported earlier (see Online Appendix J).

Last, it is also possible that the length of the relationship between the endorser and the brand influences the impact of the firm response announcements on the stock market.[15] For this robustness analysis, the model is extended by a dummy variable, which measures how long the endorser has had a contract with the brand. The dummy variable indicates if the endorser has been with the brand for less (1, $n = 126$) or more (0, $n = 104$) than one year. Adding this variable to the analysis does not change any of the findings for the full sample analysis reported earlier (see Online Appendix K).

Conclusion

Previous research suggests that negative celebrity endorser publicity leads to negative stock returns (Louie et al. 2001, Bartz et al. 2013, Knittel and Stango 2014). Barely anything is known about how announcements of firm reactions to these events influence stock returns. Chung et al. (2013) estimate that Nike's decision not to terminate Tiger Wood's contract preserved about US$3.5 million in revenue and US$2.7 million in profit during the six months following his scandal. Do investors anticipate such effects? This study provides evidence that the stock market does anticipate such effects. Accounting for the Tiger Woods' contextual factors (blame, occupation, product fit, endorser apology), the predicted difference in stock returns between maintaining and suspending him is 1.22%, which means that investors responded more positively to Nike's immediate announcement of maintaining (versus suspending) him.

This study is the first to quantify (1) the full range of firm reactions (suspend, maintain, remain quiet) and (2) response timing (slow versus fast) and (3) to identify conditions under which the stock market rewards maintaining or suspending the endorser. All reported findings are confirmed by a wide range of alternative models to address concerns about endogeneity bias, outlier bias, and omitted variable bias. The most surprising finding is that firms can even gain in value depending on their response. Announcements of firms' reactions positively affect ARs, especially if they occur quickly after the negative publicity surfaces. Prior research has rarely pointed out that firms' responses to negative events can result in increasing firm value (Marcus and Goodman 1991). The notion that a negative event represents an opportunity for the firm to excel is intriguing. This finding certainly does not imply that firms should artificially create a negative event so that they can respond quickly and increase their firm value because such willful deceit will backfire immediately if it becomes public.

However, the window of opportunity closes about three days after the event, and the firm's response becomes ineffective afterward. Results also show that issuing statements suspending or maintaining the endorser both yield more positive ARs than not reacting at all. Further analyses identify conditions under which the stock market rewards maintaining or suspending an endorser. Firms have more positive ARs when they (1) suspend high-blame endorsers, (2) suspend endorsers whose negative publicity is related to their occupation, (3) maintain endorsers with a high product fit, and (4) do not suspend apologetic endorsers.

Future Research

The following five areas might be fruitful avenues for future research. First, future research could take a closer look at the relationship between immediate stock returns, media attention, ongoing advertising featuring the endorser, and firm reaction. Because the event and the following media firestorm can happen so quickly, it would be very interesting to examine the relationship on an hourly or even minute basis to fully capture the data-generating process. Behavioral experiments with the various stakeholder groups, such as opinion leaders, investors, and consumers, could provide additional insights into the temporal dynamics among these variables.

Second, this study identified four moderators under which the stock market rewards maintaining or suspending. Product fit was one of these moderators, but firms might also choose their endorsers for other attributes, such as specific values or character traits that firms would like to represent in the market place. Future research could analyze how the stock market reacts to maintaining or suspending an endorser if these values and/or character traits are jeopardized by the celebrity's misbehavior.

Third, legal contracts govern the endorser–firm relationship (e.g., scope of the endorser's services, such as geographic coverage, product focus, extent of advertising appearances, contract duration, and contract volume). These contracts frequently include moral clauses that define types for misbehavior and corresponding penalties. Such details are typically private firm information but might influence not only firms' responses to misbehavior but also investors' responses if the contract details leak to the public. Future research could examine how legal contracts influence both firm and investor responses to endorser misbehavior.

Fourth, prior research examining Tiger Woods' case suggests that negative endorser publicity can signal market wide reputational risks and spill over to competitors whose marketing activities also involve endorsers (Knittel and Stango 2014). Because of the scope of this research, this study does not analyze how announcements of firms' responses to negative endorser publicity can affect firms' competitors. Does their stock price increase or decrease once the negative publicity surfaces and the focal firm responds or not? Also, how do competitors react, and what are the financial consequences thereof?

Fifth, this study argues and shows that the stock market expects firms to respond quickly to the negative publicity. If this is the expectation, why do most firms act differently? There is currently room for speculation. Potentially, firms underestimate the impact of the event on their business or hope that the media frenzy declines after a while and business goes back to normal. Also, some firms' organizational structure and processes as well as legal compulsion might not allow for immediate responses (Pearson and Clair 1998, Dawar and Pillutla 2000, Managing IP 2016). Further, many managers might perceive the situation as aversive stimulus and threat from which they tend to withdraw or to which they preferably respond with internal measures. Only few managers might recognize it as a challenge or opportunity to which they respond with great eagerness and externally directed actions (Dutton and Jackson 1987). Future research could provide more insight on institutional factors and psychological processes influencing managerial decision making in times of a potential crisis.

Acknowledgments

The authors thank the Department Editor Juanjuan Zhang, the associate editor, and three anonymous reviewers for suggestions that substantially improved this article. They also thank Rajesh Bagchi, Jovica Breberina, W. Timothy Coombs, Paul Herr, Devon Hock, Raman Kumar, Kent Nakamoto, Ulrich Rendtel, Katherina Schley, Gautham Vadakkepatt, and Michael A. Wiles for helpful comments on earlier drafts of this article. The authors thank the participants of the research seminars at Kuehne Logistics University in Hamburg, the University College Dublin, and the Wittenberg Centre for Global Ethics in Lutherstadt for constructive comments and suggestions. Finally, they thank Baran Oezalp for support during data collection. Both authors contributed equally to this article.

Endnotes

[1] In this study, the impact of firms' responses or firms' reactions on stock returns always refers to the impact of the announcement of a firms' responses/reactions on stock returns. The authors thank an anonymous reviewer for this suggestion.

[2] The coding uses the first firm reaction because only one firm reverses its initial reaction within the event window. An analysis of all models without this particular case shows that results are stable and do not alter the findings presented below.

[3] This variable is available only for the subsample of 206 events because the data provider Kantar did not track advertising data before 1995. This subsample is used for robustness analysis (for details, see section "Robustness Analysis Strategy").

[4] The authors thank an anonymous reviewer for this suggestion.

[5] Unlike Boehmer et al. (2013), who only apply one-to-one matching, this study applies kernel matching and one-to-one matching as robustness checks. Further, unlike Boehmer et al. (2013), who calculate the covariate and outcome differences for each treatment–control pair, this study uses the observation weights w_{i^*e} from the matching model in the regression model. For more details about the alternative model specifications, refer to the section "Robustness Analysis Strategy" and to Table 3.

[6] Effects are robust against outlier bias. For more details, refer to the section "Robustness Analysis Strategy" and to Table 3.

[7] Fixed effects in event study regressions are common practice in finance (Beber and Pagano 2013, p. 378; Boehmer et al. 2013, p. 1372). However, fixed effects do not exclude the potential influence of unobserved time-varying variables on the estimated relationship

between treatment and outcome. The section "Robustness Analysis Strategy" discusses this endogeneity issue.

[8] Alternative cluster variables, such as *firm*event*, *firm only*, *event only*, and *celebrity only*, do not alter the results. The results show *firm*event* cluster-robust standard errors.

[9] For the day of the actual firm reaction, the data include the binary control variable *Firm Response (Day of)*$_{i*e,t}$ = 1. For all subsequent days after the firm response, the data include the binary variable *Firm Response*$_{i*e,t}$ = 1. Using these two different variables, the model reduces contemporaneous correlation concerns.

[10] Tests also cover a linear and binary specification of *Timing*. As expected, the regression coefficient of the interaction effects is usually significantly negative in the models ($p < 0.10$) but is less pronounced compared with the nonlinear specification.

[11] Reverse causality is not a concern here (unlike for *Firm Response*$_{i*e,t}$). Endorser apology is a new piece of information that could affect how the stock market perceives a firm's response.

[12] A generalized propensity score matching approach (Hirano and Imbens 2004) corrects for observable self-selection bias concerning the exact response day. Online Appendix G outlines the technical details and presents results. This analysis reveals that firms would receive significantly more negative ARs if they delayed their response from day 0 to day 1 (–1.396%; $p < 0.05$), from day 1 to day 2 (–0.981%; $p < 0.05$), or day 2 to day 3 (–0.630%; $p < 0.05$) but not after that ($p > 0.10$). Using this result, this study divides firms into quick (days 0, 1, and 2) and slow (days 3–19) responders.

[13] The minimum robustness coefficient $\rho_{\min} = 0.327$ is smaller compared with the tests discussed so far. Model 14 (smallest estimate and widest confidence interval in upper-left chart of Figure 4) is the reason for this lower degree of robustness. This model is potentially less well specified than most other models because it corrects for firms' decision to reduce advertising spending, which can be attributed to many other factors beyond the negative publicity.

[14] The authors thank an anonymous reviewer for this suggestion.

[15] The authors thank an anonymous reviewer for this suggestion.

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