Brand Reputation, a Dilemma, or a Solution? The Case of Data Breach Crises.

Seyyed Amirhossein Hosseini

A Thesis

in the Department of

Marketing

Presented in Partial Fulfilment of the Requirements

for the Degree of

Master of Science (Marketing)

at Concordia University

Montréal, Québec, Canada

April 2024

CONCORDIA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

This is to certify that the thesis prepared

By: Seyyed Amirhossein Hosseini

Entitled: Brand Reputation, a Dilemma, or a Solution? The Case of Data Breach Crises.

and submitted in partial fulfillment of the requirements for the degree of

Master of Science (Marketing)

complies with the regulations of the University and meets the accepted standards with respect to originality and quality.

Signed by the final examining committee:

_____ Chair

Dr. Jooseop Lim

_____ Examiner

Dr. Yuyan Wei

_____ Examiner

Dr. Tieshan Li

_____ Thesis Supervisor(s)

Dr. Jooseop Lim

Approved by _____

Dr. Darlene Walsh, Chair of Department

_____

Dr. Anne-Marie Croteau, Dean of Faculty

Abstract

Brand Reputation, a Dilemma, or a Solution? The Case of Data Breach Crises.

Seyyed Amirhossein Hosseini

The examination of brand reputation has constituted a focal point within the realm of marketing, albeit with a dearth of exploration within the business crisis literature. This paper tries to contribute to this literature by elucidating the brand reputation's dualistic impact during a crisis, consequently seeking to reconcile the previous varied results. We demonstrated that a pre-crisis transitory brand reputation (TBR) can exacerbate the damage of the crisis for less-reputed brands while a long-term prior brand reputation has a positive role after a data breach crisis. Additionally, we have shown that the negative effect of TBR is more vivid for B2C firms. We introduced the paradox of transitory resources that states in order to obtain long-term resources to preserve the brand in times of crisis, one should obtain transitory resources that backfire. We build our hypotheses based on the Expectation-Evidence framework and the literature on the data breach crisis. We used Twitter (rebranded as "X") to gather and analyze stakeholder-generated content before the crisis. The sentiment analysis approach based on a bag of words is used in an event study methodology and cumulative abnormal return is the dependent variable. The findings of this study underscore the importance of a robust and enduring long-term brand reputation for businesses. Furthermore, a shift away from reliance on transient advertisements, returns, and reputational constructs is necessary for the firms to successfully recover after a crisis.

Keywords: Brand Reputation, Transitory Brand Reputation, Crisis Recovery, Data Breach, Paradox of Transitory Resources

Acknowledgements

Table of Contents

List of Figures

List of Tables

Introduction

The discourse surrounding a brand's reputation invariably invokes interconnected notions such as customer satisfaction, loyalty, and the caliber of products or services offered. Consequently, a brand's reputation assumes an exceedingly invaluable status within the corporate milieu. What happens when a reputable brand faces trouble and a crisis? Does the brand reputation endure the crisis unscathed, or does it suffer due to the recalibration of stakeholder expectations, thereby resulting in an adverse impact? This is an ongoing debate in the literature on business crisis, and it is noteworthy that existing scholarly inquiries have not singularly concentrated on meticulously scrutinizing the precise role played by brand reputation in the aftermath of a crisis (Swaminathan et al, 2022).

The concept of brand reputation has been widely used in the literature of crisis management. Most of the previous papers have shown that brand reputation is in fact a buffer in a crisis and dampens the overall negative effects of it (Raithel et al, 2010). There are some limited studies that investigate the possible backfire effects of brand reputation and brand equity (Xu, 2015). Research shows that pre-crisis advertising can have the twofold role of buffering or backfiring effects (Liu et al., 2017). Businesses ought to determine their advertising expenditure considering both the seriousness and the probability of a crisis and it's important to understand that increasing advertising expenditure indiscriminately is not always beneficial (Mukherjee & Chauhan, 2020). Companies' customer engagement initiatives and greenwashing could also have backfiring effects (Beckers et al., 2018; Berrone et al., 2015). Studies indicate that providing complete solutions following a crisis is crucial for companies with strong brand equity, just as it is for those with weaker brand equity. This is because of the fact that high brand equity increases customer expectations (Mafael et al., 2021). Corporate social performance (CSP) could also have some backfiring effects if it is not in synergy with the firm's marketing strategy (Luo & Bhattacharya, 2009). There is a need for research to show when a brand's reputation can be a buffer and when it backfires. In this paper, we first illustrate a new concept that is called transitory brand reputation.

Transitory brand reputation simply is in fact the brand reputation in a duration of time. Transitory brand reputation is created by all the stakeholder-generated content in a period. Prior literature shows that increasing advertisements after shareholders complaints can mitigate the damage to firm value (Wies et al, 2019). However, no research has demonstrated the effects of a prior transitory brand reputation or electronic word of mouth (EWOM) after a crisis. We have demonstrated simultaneously the effects of transitory brand reputation and overall brand reputation. Furthermore, we will discuss the existing body of literature concerning data breach crises and the various research clusters within this domain. Afterwards, we build our foundation on the expectation-evidence framework and business crisis literature. Our results based on an event study with 254 data breach cases show that a positive pre-crisis transitory brand reputation can backfire while a long-term brand reputation (hereafter brand reputation) can protect the firm after a crisis. The interplay effect between B2B/B2C and transitory brand reputation on

cumulative abnormal return is demonstrated as well. Based on these findings, we introduced the paradox of transitory resources. This paradox posits that in order to be able to have a long-term resource to protect the firm in a crisis, the firm should start to have a transitory resource that backfires in a crisis. Afterward, we will discuss the implications and future research avenues.

Research Background

Brand Reputation, EWOM, and Transitory Brand Reputation

The discourse surrounding brand reputation has been a focal point in numerous scholarly investigations. This subject has not existed in scholarly isolation; rather, it has been intricately intertwined with related conceptual frameworks such as corporate reputation and brand equity within extant literature. According to Selnes (1993), brand reputation has been defined as the perception of quality associated with the name. We notice a consistent definition in Kim et al. (2011) paper that *"Brand reputation is the positive associations with the brand that increase the appeal of a firm's products so that customers are more loyal to and willing to pay a higher price for the brand."* The general definition of corporate reputation is an assessment of a firm by its stakeholders that results from the organization's past behavior and projections for the future (Ferguson et al., 2000). Therefore, based on these definitions, we deduce that for the firms with a branded-house strategy (those firms that use a single brand for all their products) corporate reputation and brand reputation are the same constructs while for companies that use a house-of-brands strategy (those firms that use multiple brands) brand reputation is a component of corporate reputation (Rust et al., 2021). There are some varied definitions for brand equity. We can define it from either the organization's perspective, or customers' perspective. Customer-based brand equity concept defines brand equity in terms of the individual consumer's brand knowledge and brand strength (Wood, 2000). Whereas, the organization-based definition focuses on the total valuation of a brand as an asset on a balance sheet that is more like the financial value of the brand (Tiwari, 2010).

Although brand reputation is a comprehensive and general concept, there could be some ramifications, such as product quality reputation (Mukherjee et al., 2018), innovation reputation (Morgan et al., 2021), information systems reputation (Syed & Dhillon, 2015), among others. Brand engagement (Ferreira & Zambaldi, 2019; Mansur & Ali, 2017), perceived quality (Wang et al., 2010), and corporate social responsibility (Rasoolimanesh et al., 2021) are some examples of precedents of brand reputation. To mention some antecedents, brand reputation can positively affect customer loyalty (Leaniz & Rodríguez, 2016), consumer's trust (Afzal et al, 2010), customer satisfaction (Aryani et al., 2021), and purchase intention (Agmeka et al., 2019). Brand reputation can be transferred to brand equity, and corporate social responsibility can facilitate this transformation (Mahmood and Bashir, 2020). Brand reputation can also play a buffer role in a brand crisis. In the literature of business crisis, it is demonstrated that high-reputed brands will have less damage after a crisis (Gwebu et al., 2018).
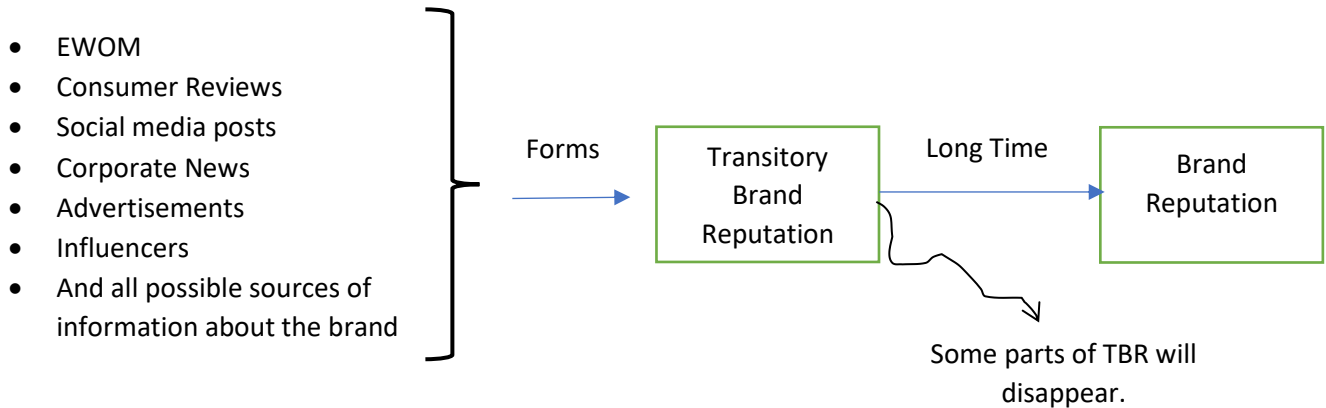
2

Another related construct is the electronic word of mouth (hereafter EWOM). EWOM can be defined as all internet-mediated communications between consumers and potential consumers (You & Joshi, 2015). Volume, valence, and variance are three important keys that have been used in EWOM-related research (Hsu & Lawrence, 2016). Valence is the degree of positiveness or negativity of consumer-generated content and volume, and variance are respectively the number of all reviews and the variance of their valences (Zablocki et al., 2019). EWOM has been studied in various areas such as the effects of EWOM on purchase intention (Erkan & Evans, 2016), perceived quality (Roy et al, 2021), and customer satisfaction (Tandon et al, 2020), the role of geographical distance in EWOM (Todri & Andrews, 2022), and the potential power of EWOM to become a firestorm (Herhausen et al., 2019). An example of the usage of EWOM in business crisis literature is Rosati et al. (2019) that states the use of social media during crises can exacerbate the consequences for the firm. On the other hand, little attention has been paid to the relationship between EWOM and brand reputation. We know that positive EWOM generates a positive brand reputation (Serra-Cantallops et al, 2018). However, we don't know how it happens, what is the mechanism, and when it doesn't happen.

Rust et al. (2021) changed the definition and the approach to measuring brand reputation by connecting two separate brand reputation and EWOM concepts. Previous pieces of research mostly have used secondary data, varied organizational rankings, and consumer surveys to define the firms' brand reputation. Rust et al. (2021) defined brand reputation as the overall impression of all stakeholders that drives firm performance. According to this definition, the focus of the analysis is on all stakeholders instead of just consumers or accounting measures. Brand equity, corporate reputation, brand reputation, and EWOM could be merged into each other in this approach and form a comprehensive brand reputation construct. This approach uses social media instead of firm rankings or surveys to obtain real-time changes to the brand reputation of the firms. By performing sentiment analysis based on the bag of words approach on all stakeholder-generated content, one could obtain the brand reputation score for a firm. Previous methods assumed that brand reputation is stationary between instances that the rankings change or until another survey is conducted by an organization disseminates, whereas Rust et al. (2021) calculates day-to-day changes to the brand reputation. Another advantage of this approach is that it contains thinking, talking, and feeling of stakeholders as well as their knowledge of the brand.

By providing this approach and the ability of the analyst to have hour-to-hour data about brand reputation, we define a concept called Transitory Brand Reputation. A transitory brand reputation (hereafter TBR) is the reputation of a brand in a specific period regardless of its history. The important point about TBR is that it is not actually ephemeral because some of it (or none of it) will stick to the firm's long-term reputation after a while and shape the brand's reputation and familiarity in the long run. Due to this transformation, we have chosen the word transitory to demonstrate the transformation in its concept as well as its impermanence. Firms can analyze it day to day to observe whether they are heading to the destination that is defined by their brand's vision or not. In another view, TBR can be observed as the overall stakeholders'

EWOM score in a duration of time defined by the analyst. EWOM and all stakeholders generated contents in a period create TBR and some of this TBR transform to merge into the brand reputation while other parts will be forgotten. This process is timely and requires energy and dedication from the brand side to make their TBR ineffaceable and more durable in the minds of consumers. In Figure 1, this process is demonstrated.

Figure 1- The creation and transformation of the transitory brand reputation

- EWOM
- Consumer Reviews
- Social media posts
- Corporate News
- Advertisements
- Influencers
- And all possible sources of information about the brand

Forms → Transitory Brand Reputation → Long Time → Brand Reputation

Some parts of TBR will disappear.

The paper of Rust et al. (2021) showed that we can measure a brand's reputation for a period (TBR) using contents generated by stakeholders. In this paper, we want to use the concept of TBR in a business crisis context and resolve the ongoing debate in the literature on crisis management on whether brand reputation can be a buffer to protect the brand or backfire and exacerbate the problem (Swaminathan et al, 2022). Prior to advancing into subsequent discussions, our next chapter will provide a concise exploration of data breach crises.

Data Breach Incidents and Crisis Recovery Resources

Data breach incidents have been frequently investigated in marketing research in the last two decades. Because of the advancements of computers and volume of data produced in companies and personal devices, the concerns for data privacy and methods to preserve data have been an important issue for the scientific community (Martin & Murphy, 2017). These data breaches could be the result of the negligence of an employee, cracking a hacker into the systems of the companies, or even theft. Regardless of the reason, data breaches can harm a brand's reputation (Janakiraman et al., 2018). Consumers will lose their trust after these incidents, and this will affect their satisfaction (Malhotra & Malhotra, 2011). Firms experiencing a data breach can face a drop in their stock prices for the first few days after the announcement or even have more persistent effects (Avery, 2021). Due to the fact that sometimes data breach is a vague service crisis and firms evade clarifying additional information, it produces considerable volume of online EWOM

and web search. Stakeholders try to guess and express their opinion. This is a useful attribute for our research purpose that needs online content produced by stakeholders.

Prior pieces of research about business crises fall into three main groups. The first group observes the phenomenon from the view of a consumer after a data breach incident. For example, Turjeman & Feinberg (2023) discuss consumer behavioral changes following a data breach. Janakiraman et al. (2018) mention that after a data breach announcement, consumers decrease their spending and migrate from breached channels to unbreached ones. Consumers are concerned about the usage of their data in the firm and this concern increases when sensitive data are collected which are incongruent with the business context (Lwin et al., 2007).

The second group has the point of view of the company. In these pieces of research, the company is at the core of the problem, and its financial, and marketing performance, or a winning strategy are the subject of the discussion. For instance, Vaerenbergh et al. (2019) investigate the different response strategies of the firm after the crisis. Zhu et al. (2023) discuss the protection from corporate social responsibility after a crisis. Rasoulian et al. (2017) address the long-term role of apology, compensation, and system improvement response strategies on the idiosyncratic risk of the firm. Moisio et al. (2019) illustrate the effectiveness of scapegoating as a crisis response strategy. Foerderer and Schuetz (2022) show that if the data breach announcement happens on days with high news pressure in the media, there will be fewer negative effects for the firm. The last group of the papers observes the data breach incident from the consumer's and the firm points of view simultaneously. For instance, Ou et al. (2022) state that various response strategies after a crisis can lead to different consumers' reactions. Choi et al. (2016) focus on the effects of the firm recovery strategy and the perceived justice on the psychological responses of the consumers. Martin et al. (2017) discuss the interplay of the firm's data management practices, customers' data vulnerability, and firm value.

There is an important concept in business crisis literature called crisis recovery resources. The definition of crisis recovery resources could be defined as all the tangible and intangible resources of the firms that are used to restore the firm to the same level or different state as before the incident. Firm size, firm age, profitability, and liquidity (Rasoulian et al., 2021), marketing efforts of the company (Xiong & Bharadwaj, 2013), brand familiarity and loyalty (Cleeren et al., 2008), corporate social responsibility (CSR) (Bae et al., 2020), and corporate's IT capability (Kashmiri et al., 2016) are some examples of the crisis recovery resources that research has shown as effective buffers against a business crisis, particularly data breach. Brand reputation is another resource that is invaluable for companies (Greyser, 2009). Literature demonstrates that if customer data vulnerability occurs for trusted and high-reputed brands, customers are less likely to spread negative word of mouth (Martin et al., 2017). Coombs (2007) shows how a crisis can impose reputational damage on a firm by developing Situational Crisis Communication Theory (SCCT). According to Gwebu et al. (2018) high-reputed brands will have fewer negative consequences after a data breach incident. All in all, data breach crises will affect brand reputation, and research shows that the most serious situations are those crises that affect the attributes related to the

essence of the brand (Greyser, 2009). Previous research has demonstrated that the announcement of a data breach crisis typically has a negative impact on firm value. (Martin et al., 2017; Malhotra & Malhotra, 2011; Rasoulian et al., 2021). Therefore, we hypothesize that:

H0 – Firm data breach announcement will negatively affect its cumulative abnormal return.

Expectation-Evidence Framework

What happens when two contradictory pieces of evidence show up simultaneously for a decision-maker? Literature suggests that at this point there will be a cognitive dissonance in the mind of the decision maker and they will discount one contradictory fact and rely on the other fact to make their decision based on the facts available, personal preferences, and the situation (Gwebu et al., 2018). The expectation-evidence framework explores different possible outcomes for decision-makers if they face two contradictory facts (Dawar & Pillutla, 2000). In consumer behavior research, this framework is recognized as expectation-confirmation theory (Lin et al., 2009). The first fact comes from the prior expectation and the second fact comes from the new evidence. If the new evidence and the prior expectation are in the same line, there won't be any cognitive dissonance and the decision is clear. On the other hand, if the new evidence violates the expectations, there will be two possible outcomes. The decision maker either accepts the new evidence and discounts the expectations or discounts the new evidence and relies on the prior expectations (Dawar & Pillutla, 2000). Without any further information, we can't predict which choice the decision maker chooses. It is all dependent on the strength of the prior expectation and the new evidence. If the prior expectation is stronger than the negative evidence, the decision maker will discount the evidence and rely on the prior expectation and vice versa.

Customers have some previous expectations about a brand and a firm (Zeithaml et al., 1993). For example, loyal customers of a brand expect high-quality products and services (Forrest, 2020). Service failure happens when service performance falls below the expectations of the customers (Sivakumar et al, 2014). Furthermore, customer satisfaction happens when brands meet the customers' expectations. A high brand reputation increases customer satisfaction, and loyalty (Selnes, 1993). Therefore, a high brand reputation can increase the customer expectations of the services and products like how high service quality increases the service recovery expectations (Kelley et al., 1994). When a high-reputed brand faces a crisis, there will be cognitive dissonance in the minds of the stakeholders (Sohn and Lariscy, 2015). On the one hand, there is a high-reputed brand with all previous brilliant customer experiences and memories, and on the other hand, there is a crisis that contradicts those expectations. In these cases what will be the decision of the stakeholders? We will address this topic in the forthcoming section.

Research Hypotheses

Gwebu et al. (2018) state that the decision for the last question would be discounting the negative evidence or putting more weight on the good reputation and less weight on the crisis. This is because of the fact that the diagnosticity of the high brand reputation cue is much more powerful than the diagnosticity of a data breach crisis especially when stakeholders think that the firm is not responsible (Wei et al., 2017). Although research suggests that investors put more weight on negative cues and are risk averse (Pratt, 1978), positivity biases will mainly occur for high-reputed brands affected by data breaches for two reasons. The first reason is that a data breach is not observed as a catastrophic crisis that the firm can't recover from. Also, the occurrence of a data breach in many cases does not show the incapability and incompetency of the firm. Secondly, firm's reputation is the result of so many years of hard work and dedication, which demonstrates why it is a more diagnostic signal (Basdeo et al., 2006). In addition, the cue for brand reputation is even more important than the crisis response strategies, and whatever these strategies are, if the brand has a high reputation, the crisis will have a less negative impact on firm value (Gwebu et al., 2018). High-reputed brands don't determine timing to announce their crisis to have less damage and don't need to have proactive strategies (Eilert et al, 2017); (Chen et al., 2009). High-reputed brands even have a buffer against deceptive advertising (Wiles & Lindsey, 2010). Research shows that high-reputed brands will have better post-crisis reviews (Kiambi & Shafer, 2016). Ho et al. (2017) address the halo effect of brand reputation during a crisis and show that prior advertising can increase this effect and protect the firm amid the crisis. In conclusion, previous research shows that brand reputation can be a buffer against crises and positive bias occurs for them. Thus, the next hypothesis will be:

H_1 – Brand reputation will positively affect the cumulative abnormal return (CAR) of the firm after a data breach crisis.

Although high-reputed brands have a buffer against various crises, less reputed brands are more vulnerable because they don't have sticky brand attractions. Although literature provides some understanding of this concept, our knowledge regarding TBR (transitory brand reputation) and its buffer or backfire role in a crisis remains lacking. TBR focuses on a limited amount of time and calculates the brand reputation in that period. Due to the fact that brand reputation is a dynamic concept and will change day by day and hour to hour, a pre-crisis TBR is a reputation that the firm acquires or misses right before the time of the crisis. We have mentioned that for high-reputed brands, their reputation is a stronger cue than the crisis. For lesser reputed brands we don't have this positivity bias in the minds of stakeholders, hence they rely on the facts about the business crisis and count on them to make any decisions. It is possible for a high-reputed brand to have a bad TBR in a period. The bad TBR may come from all possible sources like a crisis, a disaster, a wrong advertisement, or even an employee wrongdoing. It is also possible for a less-reputed brand to have a high TBR in a period. For instance, research shows that corporate social

responsibility initiatives can increase corporate reputation for controversial sectors (Aqueveque et al, 2018). The specific question here is can a positive pre-crisis TBR preserve a low-reputed brand in times of crisis? Or can a negative TBR incur damages to a high-reputed brand after a crisis?

Previous pieces of research express that EWOM and user generated contents can affect stock market return of the firms directly through changing the expectations of the investors (Nguyen et al., 2020), and indirectly by influencing customer satisfaction (Fornell et al., 2006). Therefore, we also expect TBR to affect stock market return. TBR is not as strong as a long-term brand reputation. We know TBR is impermanent, and does not have the stickiness and persuasiveness of the long-term brand reputation. Therefore, we should not expect that it can play a buffer role. In fact, a positive TBR without a strong solid background reputation could signal a deceptive endeavor to demonstrate a good image, and research shows that deceptive endeavors harm the firm value (Tipton et al., 2009). Due to the fact that a positive TBR is not a strong cue, a negative cue like a data breach crisis can be a dominant cue and incur damage to the brand even more than the times with a neutral TBR because of the negative signal that it gives to the stakeholders. Another explanation for this incident is that when TBR is positive (regardless of brand reputation) it increases the expectations of the stakeholders such that they don't expect a negative incident (Kopalle & Lehmann, 2006). When investors face a negative and severe crisis after a period of positive news, they don't expect it and react more harshly (Gao et al., 2015). Put it in other words, stakeholders may think that TBR is fake and is not valid, so they react more fiercely. Previous research show that a proactive strategy after a product recall could have severe negative effects on the firm value because of the negative signal it gives to the investors (Chen et al., 2009).

The backfiring effects of the positive resources have been observed in other areas as well like when marketers increase the pre-lunch advertisement of the movies. In that case, they are increasing the expectations of the consumers and a low-quality movie is another contradictory cue for the consumers. Therefore, for low-quality movies, an increase in pre-lunch advertising would backfire and incur more damage (Joshi & Hanssens, 2009). We have observed a similar effect after a product recall crisis for high-quality products. More quality signals could not save the brand after a product harm crisis; whereas it will backfire because of the higher expectations that it gives to the stakeholders (Liu & Shankar, 2015). Gao et al. (2015) demonstrated that increasing advertisements for a product that experienced a recall could sharpen the firm value loss when the recall contains a major hazard. This major hazard signals a more important cue than the previous advertisements and because of the increase in consumer expectation by the advertisements, it will backfire and have a reverse effect. Pullig et al. (2006) showed that certain brand attitudes insulate the brand in times of negative publicity while brand attitudes held with uncertainty backfire and exacerbate the negative consequences. We expect a positive TBR to have a similar backfiring effect for less-reputed brands.

Furthermore, a negative TBR can prepare the minds of stakeholders to accept another negative occurrence like a data breach incident. Therefore, we don't expect a sudden drop in the stock

8

market value when there is a prior negative TBR. All these explanations are less vivid for high-reputed brands since the strength of the cue of the high long-term reputation is far more powerful than other cues and a positive or negative TBR will have a weaker effect and can't change the dominant effect of a long-term brand reputation (Wiles & Lindsey, 2010). When TBR is high, there is a positive atmosphere and stakeholders hear good news about the firm and they are familiar with the firm. Research shows that between favorability and being known, which are two dimensions of corporate reputation, there is a negative interaction effect (Wei et al., 2017). A counter argument in this case is that a negative TBR could amplify the negativity of the crisis and decrease firm value, however based on two reasons it won't happen. The first reason is that the diagnosticity of a long-term brand reputation is far more powerful than a negative or positive TBR (Wei et al., 2017). Therefore, the effect of a high brand reputation will eradicate the effect of positive or negative TBR. The second reason is that for a less-reputed brand a negative TBR affects CAR before the crisis and prepares the minds of the investors for a crisis, therefore they will accept the crisis and react less radically. Research shows that two subsequent negative information are more favorable for investors in comparison to two simultaneous negative information (Cianci, 2008). Therefore, the second consequent bad news could have a lesser effect on investors. Based on all these rationales, we develop our next hypothesis:

H_2 – Pre-crisis TBR will negatively affect the cumulative abnormal return of the firm after a data breach crisis.

Research Design

Method and Data

The foundation of this research is built on an event study approach. There are a plethora of papers about business crises and the interface of marketing and finance using event study methodology (Agrawal & Kamakura, 1995; Liu et al., 2017). There is a decent review paper about using event study methodology in marketing (Soresco et al., 2017). An event study approach tries to limit the time of the analysis to a period after an event. By doing so, it determines whether there is an abnormal stock price effect associated with an unanticipated event (McWilliams & Siegel, 1997). The linear multivariate regression approach is one of the most useful approaches in the event study (MacKinlay, 1997). We have used this approach in our research. Furthermore, the ordinary least square (OLS) method is used to estimate the main models and we have utilized a robust method for outliers checking. We have checked random sampling, not having multicollinearity, and endogeneity in this research. We expect that endogeneity is not a problem in our research since the causality doesn't go in the reverse direction for all variables and there is no simultaneity bias.

We have used all the data breach cases that are listed in the privacy rights clearinghouse as our sample with three criteria; there was at least one renowned news agency covering its story; its

stock market return was publicly traded at the time of the crisis; and there was an official Twitter (X) account for the company with at least some Tweets and followers at the time of the crisis. With these criteria, we obtained 356 cases between 2009 and 2021. We removed 77 cases because of the coincidence of the different events like stock changes, mergers and acquisitions, profit announcements, and prize winnings within one week before and after the announcement day. We removed 25 other cases because the financial information about them was not completely available in COMPUSTAT. Finally, we obtained 254 cases for our final sample. Our explanatory variables consist of brand reputation and TBR scores. There are some vital control variables in our study that will be presented in the next chapter. Our dependent variable is the cumulative abnormal return (CAR) of the firm which has been frequently used and accepted in event studies and finance research (Soresco et al., 2017). We obtained the daily returns of the firms from the CRSP database. Factiva and LexisNexis were used to obtain the different announcements of the firms and their recovery strategies. Twitter (X) is used for measuring pre-crisis TBR scores with a Python script.

Brand Reputation measurement

We have used the reputation rating data from Fortune's annual survey of "America's Most Admired Companies" to measure Brand reputation (Woodroof et al., 2019; Beckers et al., 2018). In this survey, CEOs, directors, and security analysts are asked to rank the top businesses in their respective sectors. Each business receives an overall reputation score based on how well it performs in comparison to its top rivals across eight different criteria. We have considered both the ranking year and whether the company is in the ranking in that year to calculate a score for its brand reputation. 5 years prior to the crisis announcement were considered important to be included in the data.

$$BR_i = \frac{\sum_{t=0}^{4} 0.8^t R_t}{5} \quad \text{, Where } R_t = \begin{cases} 1 & \text{, If the firm is in the Fortune's ranking in year t} \\ 0 & \text{, otherwise} \end{cases} \quad (1)$$

Where t is the year preceding the data breach announcement and BR_i is the brand reputation score of firm i. The older the ranking, the less it affects the brand reputation.

Transitory Brand Reputation measurement

Transitory brand reputation is measured using the Rust et al, (2021) approach. The procedure is explained in their paper's appendix. They have used the bag of words approach to analyze the sentiments in each tweet. Brand reputation score consists of three drivers: Value driver, brand

driver, and relationship driver. Each of these drivers has sub-drivers. The sub-drivers for the value driver are price, service quality, and goods quality. The sub-drivers for the brand driver are cool, exciting, innovative, and socially responsible. Finally, the sub-drivers for the relationship driver are community, friendliness, personal relationships, and trustworthiness. Each of these sub-drivers has its own negative and positive dictionary that can be used to categorize a tweet into one or some of them.

For a period of 33 days up to 3 days before the crisis (total of 30 days) for each case we scrapped all the tweets containing the handle of the official Twitter (X) account of the company belonging to each negative or positive sub-driver in Tweeter (X) by writing a Python script. We used Web.archive.org to find out the number of Tweeter followers for each firm account at the date of the incident and then we calculated the difference between the positive and negative dictionaries in each sub-driver divided by the number of followers. We then go on by calculating the average of all sub-drivers in a driver and then the average of all drivers and normalized them to form the transitory brand reputation score.

Cumulative Abnormal Return

Measuring abnormal stock return is predicated on the assumption that equity markets are efficient and public information is quickly incorporated into market pricing. For this purpose, we have used the Fama-French 4 factor approach to calculate the abnormal return of the firms during the event window (Luo & Bhattacharya, 2009). Through regressing each stock's returns against the market return (r_d^{MKT}), the difference of returns between small and big stocks (r_d^{SMB}), the difference of returns between high and low book to market stocks (r_d^{HML}), and return momentum (r_d^{UMD}), during an estimation period prior to the event day, one may estimate the expected rate of return for each stock on event window. Equation 2 estimates the parameters of expected rate of return of stock i on day t.

$$R_{it} = \alpha_i + \beta_i^{MKT} r_t^{MKT} + \beta_i^{SMB} r_t^{SMB} + \beta_i^{HML} r_t^{HML} + \beta_i^{UMD} r_t^{UMD} + \varepsilon_{it} \qquad (2)$$

Where R_{it} is the rate of return of stock i on day t, β_i is the coefficient which shows the sensitivity of firm i to each of 4 factors, α_i is the intercept, and ε_{it} is the error. We used ordinary least square (Hereafter OLS) to estimate the parameters of Equation1 using 250 trading days before the data breach announcements up to 10 days before them in order to not have any effects from the crisis. We estimated the abnormal return of firm i on day t using Equation 3 for the event period:

$$AR_{it} = R_{it} - (a_i + b_i^{MKT} r_t^{MKT} + b_i^{SMB} r_t^{SMB} + b_i^{HML} r_t^{HML} + b_i^{UMD} r_t^{UMD}) \qquad (3)$$

where a_i and b_i are the OLS estimates of α_i and β_i obtained from Equation 2. We have used Equation 2 to obtain abnormal return for each day and used Equation 4 to have the cumulative abnormal return (CAR) which represents our dependent variable.

$$CAR_i = \sum_{t=0}^{t_1} AR_{it} \qquad (4)$$

Where t_1 is the number of days in our event period. The multiple regression model that is to be estimated is written in Equation 5.

$$CAR_i = \alpha_1 BR_i + \alpha_2 TBR_i + Control\ Variables + \varepsilon_i \qquad (5)$$

Where CAR_i is cumulative abnormal return of firm i, BR_i is brand reputation of firm i, TBR_i is pre-crisis transitory brand reputation of firm i and ε_i is the error term. α_1 and α_2 are respectively coefficients for H_1 and H_2. In Figure 2, the diagram of our event study is demonstrated.

Figure 2 – Schematic Diagram of our Event Study
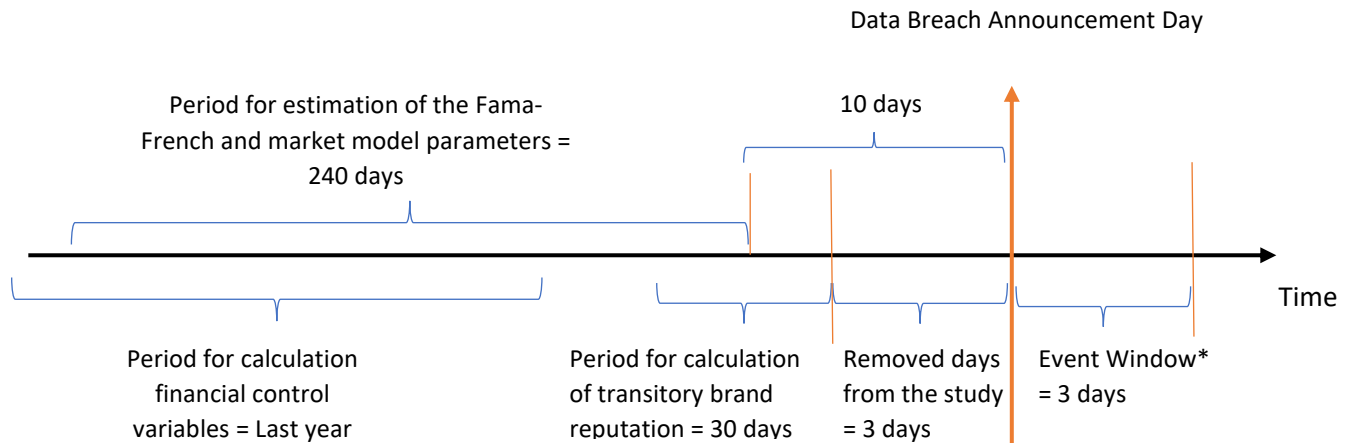
*The main event window in the study is (-1,1) days. Other event periods are calculated in Table 1

Control Variables

Firm size

Firm size is an important control variable that captures the effect of the magnitude of the firm for the stock market response. According to the literature, smaller firms' announcements would induce greater reactions (Im et al., 2001). We measured firm size as the logarithm of total asset value.

Firm age

Firm age is another criterion that investors use in order to evaluate a share in their calculations. Due to their resources, older firms are well equipped in a data breach crisis (Rasoulian et al., 2021). The age of the firm was measured as the number of years passed from their establishment years. Their establishment years were obtained using the company's official website or online secondary valid sources of information.

Liquidity

Liquidity captures the effects of available capital in the firm that can be used in order to fix the issue after the crisis. Investors use this ratio to analyze the ability of the firm to meet the costs of the crisis and alleviate the situation. Research shows that liquidity affects stock market returns (Avramov et al., 2006). Liquidity is calculated by cash and short-term investment in relation to total assets.

Leverage

Leverage is another important ratio that calculates the magnitude of the debt of the company. It is calculated as the ratio of long-term debt to total assets. Leverage is another ratio that could signal the financial resources of the firm for the investors (Homburg et al., 2014).

Profitability

Profitability is measured as return on assets ratio for the previous year of the announcement (Net income in relation to total assets). Firm profitability is another important signal for investors and can influence stock market return (Pástor & Pietro, 2003).

News strength

This control variable is a new one that we implemented for this specific research. Those pieces of news that have been seen and searched by a lot of stakeholders have more power than those that are seen by few people. We have used a novel approach to calculate the news strength of the crisis. Google trends has been used for this purpose. We compared all the cases with each other using the comparison tool of Google trends and find out the search magnitude relatively. We used the keyword for search like this: Firm name + data breach. Based on this approach, Equifax data breach in September 2018 had the most searched term in our dataset. Capital one and Facebook data breaches were in the next ranks. We compared all the cases with the Equifax data breach case and obtained the relative scores.

Firm response

Previous research has shown that firm responses to a crisis affect its stock market return (Liu et al., 2017). In order to catch this effect in our study, we have used three dummy variables that capture if the firm have used apology, compensation, or improvements of the system after the crisis (Rasoulian et al., 2017).

Year

Control variable of the year captures the effect of the specific year that may whole market experienced something negative or positive. Also, in order to catch the effect of the sensitivity

for the data breach crises by the time, we incorporated this variable into our model. We have used a set of dummy variables for this purpose.

Type of industry

Some industries may affect more than other industries after a data breach crisis. For instance, we can assume that finance and insurance companies will be affected more than construction industry by a same data breach crisis due to the nature of their jobs. We have used two-digit NAICS codes for this purpose.

Breach cause (hacked or not)

There are some causes for data breaches like theft, hacking, or employee negligence. Hacking breaches may demonstrate the lack of IT competencies in the firm in contrast to a theft which is seen as an accident. We have used a dummy variable that captures whether the data breach is caused by hacking or not. Approximately 40% of our cases were hacking incidents.

Market capitalization

This variable is calculated by logarithm of the product of the number of shares outstanding multiplied by the market price. Due to the fact that this variable has a high significant positive correlation with the calculated brand reputation in Equation 1 and the problem of multicollinearity, we decided not to use it as control variable in our study.

Results

Descriptive Statistics

The industry composition of the dataset is demonstrated in Table 3. The sample contains varied companies from different industries. Table 2 shows the mean, standard deviation, and correlation matrix for all the explanatory variables. All the correlations are under 0.5. There are three correlations greater or equal to 0.4, therefore we calculated the variance inflation factor (VIF) for the variables and Table 2 shows that all of them are below 1.5, which is greatly below the guideline threshold which is 10 (O'Brien., 2007). Therefore, multicollinearity is not an issue in our analysis.

Event Study Analysis

In order to find the best event window, we have calculated the Cumulative Average Abnormal Return (Hereafter CAAR) in percentage for different event windows.

$$CAAR\% = \frac{\sum_{i=1}^{N} CAR_i}{N} \times 100 \qquad (6)$$

Where N is the sample size. Table 1 shows the results for 6 days: The announcement day (Day 0), 2 days before it, and 3 days after it. We found that investors knew about the incident from a day before the official announcement and reacted negatively on day -1. This reaction was repeated on day 1. However, there is not any evidence showing the leakage before day -1 since on day -2 CAAR is not significantly negative based on three different tests. We have used the T-test and generalized sign Z (Cowan) test which are respectively parametric and nonparametric tests. (Cowan, 1992). We have also added the Patell test which is another parametric test (Patell, 1976). The results confirm our H_0 and we expect a negative CAR after the data breach announcement. According to the results, we have chosen (-1,1), a three-day event window for our analysis. In this event window, we have an average of 0.64 percent drop in firm values that considering the average total asset value of the firms in our dataset (US $25,363 million) corresponds to a drop of US $162 million in firm value within 3 days.

Table 1 - CAARs for Data Breach Announcement (N = 254).

Event Window	Cumulative Average Abnormal Return (CAAR) %	T Test	Sign Test Z (Cowan)[1]	Patell Test Z[1]
(-2,-2)	−.08	−.75	-1.10	0.56
(−1,−1)	−.24	−2.84***	−2.60***	−1,81*
(0,0)	−.10	−1.20	−.59	−1.49
(1,1)	−.30	−2.72***	-4.55***	−3.21***
(2,2)	−.13	−1.13	−1.22	−1.12
(3,3)	.000	.68	−.92	1.20
Selected event window:				
(−1,1)	−.64	−4.16***	−4.49***	−3.77***

1 – Cowan Test and Patell test's null distribution is *N(0,1)*

*p<.10; **p<.05; ***p<.01

Tests of Hypotheses

As we have shown in Table 1, H_0 is supported. Table 2 shows descriptive statistics and correlation matrix for all variables. Table 4 shows the results of our multivariate regression. We have estimated two models. Model 1 contains the main effects of Brand reputation and TBR and model 2 incorporates all control variables into the previous model. Based on model 2, we have found that brand reputation has a significant positive (β = 0.0037, SE=0.002, p<0.05) effect on CAR. Therefore, H_1 is supported. TBR has a significant negative (β = –0.0050, SE=0.001, p<0.01) effect on CAR. Thus, H_2 is supported as well. The significant negative effect of news strength (β = –0.0015, SE=0.001, p<0.01) and the significant positive effect of firm age (β = 0.0001, SE=0.000, p<0.01) are also demonstrated. Outliers are those data points that are outside the normal interval of the dataset and have various definitions and methods to find them. We have used the Elliptical Envelope method which is an unsupervised machine learning approach to detect anomaly. Based on this approach, an ellipse is drawn around the data points based on their scores using the covariance matrix and classify any data point outside the ellipse as an outlier. We have used the default contamination factor in Python which is 0.1 and found 25 outliers in our dataset. These outliers were removed, and our Model 2 was re-estimated by the new dataset with a 229 sample size. The results mirrored our findings.

Table 2 – Descriptive Statistics and Correlation Matrix (N=254).

Variables	M	SD	VIF	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Cumulative Abnormal	-.006	.022	–	1													
2. Brand Reputation	.375	.300	1.40	.23***	1												
3. Transitory Pre-crisis Brand	.027	1.099	1.14	-.26***	-.02	1											
4. News Strength	.564	5.488	1.21	-.34***	-.04	-.02	1										
5. Firm Size	4.404	1.063	1.69	.15**	.47***	.09	-.05	1									
6. Firm Age	66.823	48.67	1.25	.15**	.18***	-.12*	.04	.25***	1								
7. Profitability	.178	.146	1.29	-.04	-.12*	.03	-.08	-.21***	-.25***	1							
8. Liquidity	.232	.435	1.47	.04	-.07	-.03	.05	-.40***	-.24***	.40***	1						
9. Leverage	.275	.425	1.08	-.03	-.18***	-.00	.01	-.21***	-.09	-.01	.00	1					
10. Apology	.142	.349	1.09	-.03	-.14**	-.01	-.00	-.10*	-.00	-.06	-.04	.04	1				
11. Process Improvement	.209	.406	1.05	-.00	-.04	-.08	.00	-.06	-.03	-.04	.05	-.02	.18***	1			
12. Compensation	.327	.469	1.28	.06	-.095	-.12*	.11*	-.12*	.09	-.12*	.06	-.02	.17***	.01	1		
13. Critical Data	.189	.982	1.28	.00	-.11*	-.02	.07	-.09	.22***	-.16**	-.02	.03	.06	-.01	.39***	1	
14. Hacking	.409	.492	1.05	-.09*	-.05	-.01	.10	-.07	-.06	-.02	-.00	-.06	-.04	.00	-.01	-.08	1

*p<.10 **p<.05 ***p<.01

Table 3 - Industry Composition of the sample.	Two-digit NAICS code	Industry Name	Frequency		Example
			N	%	
	22	Utilities	1	.4	Dominion Resources Inc
	23	Construction	1	.4	D.R. Horton Inc
	31 - 33	Manufacturing	52	20.5	Boeing co
	42	Wholesale Trade	4	1.6	W W Grainger Inc
	44 - 45	Retail Trade	33	13	Bed Bath & Beyond Inc
	48 - 49	Transportation and Warehousing	5	2	Delta Airlines Inc
	51	Information	47	18.5	eBay Inc.
	52	Finance and Insurance	59	23.2	JPMorgan Chase & Co
	53	Real Estate Rental and Leasing	5	2	Fred's Inc.
	54	Professional, Scientific and Technical Services	12	4.7	Tyler Technologies Inc.
	56	Administrative and Support and Waste Services	8	3.1	ABM Industries
	61	Educational Services	1	.4	Universal Technical Institute
	62	Health Care and Social Assistance	13	5.1	CVS Health Co
	71	Arts, Entertainment, and Recreation	1	.4	The Madison Square Garden Co
	72	Accommodation and Food Services	12	4.7	Marriott International Inc

Brand reputation has a positive impact on firm value (β = 0.0055, SE=0.001, p<0.01). TBR has a negative effect on firm value (β = −0.0049, SE=0.001, p<0.01). Furthermore, we have used the M-estimator robust regression method instead of the OLS to minimize the influence of outliers. This method is also useful for reducing the concerns about heteroscedasticity. OLS minimizes the sum of squares of the residuals however M-estimator method minimizes the influence of outliers by changing the function that should be minimized. We can define this Huber loss function by:

$$\rho(t) = \begin{cases} \dfrac{t^2}{2} & , |t| \leq c \\ c|t| - \dfrac{c^2}{2} & , Otherwise \end{cases} \qquad (7)$$

Where c is an estimate of σ. (Huber, 1973). The parameter that should be minimized is $\sum \rho(r_i(x))$ where r(x) is the residual vector (r = y − Ax). Our robust regression results show the same thing and brand reputation has a positive impact on firm value (β = 0.0041, SE=0.001, p<0.01). Pre-crisis TBR has a negative effect on firm value (β = −0.0059, SE=0.001, p<0.01). Another prevalent method for finding outliers in business studies is winsorizing (Sullivan et al., 2021), (Lamey et al., 2021). We have winsorized the observations more than 97TH Percentile and less than 3th percentile for dependent and explanatory variables. We then estimate model 2 using the winsorized variables. The results remained approximately the same. Brand reputation has a positive impact on firm value (β = 0.0039, SE=0.002, p<0.05). TBR has a negative effect on firm value (β = −0.0067, SE=0.003, p<0.05).

Robustness Check

We have used the market model also to validate our findings. By deducting the projected rate of return from the actual rate of return, the market model approach calculates the anomalous return for each stock on each day by regressing each stock's returns against the returns of a market index during an estimation period prior to the event day. Equations 8, 9, and 10 define the procedure to calculate CAR for the market model like the Fama-French approach.

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{8}$$

$$AR_{it} = R_{it} - (a_i + b_i R_{mt}) \tag{9}$$

$$CAR_i = \sum_{t=0}^{t_1} AR_{it} \tag{10}$$

Where t_1 is the number of days in our event period. The results are demonstrated in Table 5. Brand reputation has a significant positive impact on firm value (β = 0.0026, SE=0.002, p<0.1). TBR has a significant negative effect on firm value (β = –0.0051, SE=0.001, p<0.01).

Table 4 – Results of the impact of Brand Reputation and Transitory Brand Reputation on Cumulative Abnormal Return of the firm (Fama-French four factor approach) (N = 254)

Variables	Model 1 (Main Effects)		Model 2 (+Control Variables)	
	B	S.E.	B	S.E.
Effects (Hypothesis)				
Brand Reputation (BR) (H$_1$+)	.0052***	.001	.0037**	.002
Pre-Crisis Transitory Brand Reputation (TBR) (H$_2$−)	−.0053***	.001	−.0050***	.001
Event Controls				
News Strength	−		−.0015***	0.000
Apology	−		−.0023	.004
Process Improvement	−		.0002	.003
Compensation	−		.0018	.003
Critical Data	−		.0006	.001
Hacking	−		.0001	.003
Firm Controls				
Firm Size	−		.0013	.002
Firm Age	−		.0001**	.000
Profitability	−		−.0080	.010
Liquidity	−		.0062	.004
Leverage	−		.0017	.003
Industry And Market Controls				
Industry NAICS Dummies and Year Dummies	No		Yes	
Adjusted R^2	0.115		0.266	

*P<.10; **P<.05; **P<.01

Table 5 – Results of the Impact of Brand Reputation and Transitory Brand Reputation on Cumulative Abnormal Return of the Firm (Market Model Approach) (N=254)

Variables	Model 1 (Main Effects)		Model 2 (+Control Variables)	
	B	S.E.	B	S.E.
Effects (Hypothesis)				
Brand Reputation (BR) (H_1+)	*.0036****	*.001*	*.0026**	*.002*
Pre-Crisis Transitory Brand Reputation (TBR) (H_2–)	*−.0053****	*.001*	*−.0051****	*.001*
Event Controls				
News Strength	–		*−.0015****	*0.000*
Apology	–		*.0001*	*.004*
Process Improvement	–		*−.0017*	*.003*
Compensation	–		*.0005*	*.003*
Critical Data	–		*−.0002*	*.002*
Hacking	–		*.0004*	*.003*
Firm Controls				
Firm Size	–		*.0013*	*.002*
Firm Age	–		*.0001***	*.000*
Profitability	–		*−.0099*	*.010*
Liquidity	–		*.0064*	*.004*
Leverage	–		*.0005*	*.003*
Industry And Market Controls				
Industry NAICS Dummies and Year Dummies	No		Yes	
Adjusted R^2	0.085		0.228	

*p<.10; **p<.05; ***p<.01

Additional Analysis

The next analysis that we have done is investigating the differential effects of business to business (B2B) or business to service (B2C). Also, we have checked whether the affected firm is a product or a service firm. We are expected to see an interaction effect for both variables. According to the literature, B2C firms could be affected more of negative EWOM (Liu, 2020). This paper shows that negative word of mouth significantly decreases the firm value for B2C firms in comparison to B2B firms. B2B companies use more rational appeals and less emotional appeals, and the positive sentiments are more useful for B2C companies (Zhang & Du, 2020). Therefore, we expect the effects of TBR to be more powerful for B2C firms. Also, because the data breach is a service crisis, we may expect it affect service firms more than product firms.

Table 6 – The results of the impact of B2B/B2C and Product/Service firms on cumulative abnormal return of the firm (N = 254)

Variables	Model 3	
	B	S.E.
Pre-Crisis Transitory Brand Reputation (TBR)	$-.0066$***	.002
Service Firms	$-.0016$	.002
Service * TBR	.0002	.002
B2C Firms	.0002	.001
B2C * TBR	$-.0024$**	.001
All Model 2 Control Variables[1]	Yes	
Adjusted R^2	0.388	

*p<.10   **p<.05   ***p<.01

1 – News strength and firm age have respectively
significant negative and positive coefficients.

For product or service firms we didn't find any significant relationship. However, if the affected firm is B2C, we find that the negative effect of TBR will be higher for it in comparison to a B2B firm. The moderation effect is significantly negative (β =–0.0024 , SE=0.001, p<0.05). This is completely aligned with the fact that B2C firms are more affected by EWOM (Liu, 2020).

Discussion

Summary of Results

In summary, we have shown that brand reputation can positively influence firm value after a crisis (H_1). Our main contribution is H_2 where we have introduced a new concept which is transitory brand reputation and found that it can negatively affect the stock market return after

a crisis. It is also demonstrated that the negative effect of TBR is more powerful for B2C firms. High annual stock market return of the firms could eradicate the effects of TBR. We have found that firm age has a significant positive effect and news strength has a significant negative effect after a crisis.

Theoretical Implications

In this paper, we have investigated the concept of brand reputation from two points of view to resolve the literature debate on the twofold role of brand reputation (Swaminathan et al, 2022). In the first approach, we have used the prevalent method in literature that uses rankings and surveys to obtain the brand reputation scores. Secondly, we have used social media and the recent approach to measure real-time brand reputation by the stakeholders generated content and introduced transitory brand reputation (Rust et al., 2021). TBR is the overall sentiment score for stakeholders' opinions in a period. A brand's overall reputation is the sentiment score of stakeholders for that brand from the establishment date up to now. Therefore, TBR will be part of the overall brand reputation of a firm. Some parts of TBR will be forgotten as the time passes and some other parts will be amplified based on the new pieces of evidence and eventually become part of the overall brand reputation. For instance, imagine that brand Z is known for its product durability. This reputation was once the belief of some stakeholders that have used the products for a long time and shared their opinions with others. These shared opinions were amplified by other opinions, available facts, company advertisements and other sources of information as the time passes and construct the overall reputation. On the other hand, there have been also some negative pieces of information about Z that are forgotten and didn't have powerful evidence to become part of the overall reputation.

In this paper, we have shown that overall brand reputation positively influences CAR after a data breach crisis and pre-crisis TBR negatively influences it. The main reason behind it is that overall brand reputation is a powerful positive signal to the investors while TBR is fragile and changes rapidly. According to the expectation-evidence framework, investors weigh the prior expectations against the crisis which is negative evidence. A positive pre-crisis TBR may show the incorrect current belief in the market because the diagnosticity of the cue for a negative crisis is more robust than positive TBR. Therefore, this fragile pre-crisis positive TBR doesn't have the power to recover the firm and it backfires. According to these obtained results, we introduce a paradox that is called the Paradox of Transitory Resources. This paradox posits that in order to be able to gain a long-term reputation to make a powerful buffer for your firm, one should start having short-term reputation which backfires in a crisis. An important hint is that this paradox is valid for resources that are transitory and can transform to another big picture resource. For instance, advertisements are not a completely transitory resource since the next advertising may do not have any relationship with our current advertising strategy.

The paradox of transitory resources is completely aligned with gambler's fallacy which posits that in the mind of an investor if a particular event occurs more frequently than normal during the past, it is less likely to happen in the future (Hirshleifer, 2001). Investors think that because of the positive TBR in the few days before the incident, the chances that the market reacts more harshly after the data breach announcement is high and they decide to react as soon as possible. On the other hand, for high-reputed brands gambler's fallacy of investors after a crisis is mild due to the company's solid and powerful resources and the history of high profitability and satisfaction. In conclusion, we have three dominant theoretical contributions in this paper. First, we have introduced the concept of transitory brand reputation and made a bridge between EWOM and survey-based brand reputation. Second, we empirically tested TBR in the business crisis literature and demonstrated its negative effect according to the expectation-evidence framework. Last but not least, we introduced the paradox of transitory resources that states for obtaining a long-term resource to shield your firm, one should have short-term resource that backfire.

Managerial Implications

According to the paradox of transitory resources, should we not focus on improving our brand to enhance its TBR? Or do we accept the risk and work until we gain a high reputation in the market? The answer is clear in our results. If a firm obtains high overall resources, they could successfully make a buffer against a crisis and protect the firm. Although the paradox of transitory resources mentions that transitory resources could have negative effects, the positive effect of the high long-term resources is more important. The result of this research indicates that companies should utilize all the possible means to gain high long-term recovery resources. Simultaneously, in order to reduce the bad effects of a crisis, they could prepare the minds of the stakeholders after it happens. The positive atmosphere before a crisis backfires for less reputed brands, thus these brands should prepare the minds of the stakeholders more than high-reputed brands.

The main managerial implication of this research is that managers should not rely on temporary resources. Temporary advertisements like influencer posts, limited earning statements and some artificial positive atmosphere for the brand could not help it on bad days and have some backfiring effects. It is vital for the managers to align their marketing strategies with the overall vision of the company and improve the reputation step by step to have a solid powerful brand reputation. Deceptive marketing strategies may show a temporary increase in sales, but it doesn't improve the brand's reputation. Due to the fact that in so many cases a crisis is not foreseeable, firms can't have pre-crisis strategies to deal with it. However, managers could use different strategies to prepare the atmosphere of crisis acceptance and dampen the damage incurred to the firm. One of these strategies is to have other announcements with the official crisis announcement that help investors cope with the problem (Warren & Sorescu, 2017). Also, in some cases, a postponement in the official announcement could provide enough time for the firm to plan a strategy to deal with the crisis and make the negative effects less intense (Eilert et

al., 2017). The crisis communication strategy is also important, and it should be carefully implemented so that it doesn't excite the investors to react and spread the negative EWOM (Langaro et al., 2022).

Limitations and Future Research

There are some limitations in this paper that future research could address. The first one is that we didn't have the computing capabilities to be able to have some samples of all stakeholder-generated data from when social media was invented up to now. Future research could gather these samples, perform sentiment analysis on them based on our approach and compare it with the survey-based brand reputation approach. We expect those to have a highly significant correlation with each other. By doing this, one could also show that a transitory brand reputation is part of the whole brand reputation. The next limitation is shown in Figure 1 where we have spoken about the transformation of TBR to brand reputation and we said that it takes a long time and enough dedication. However, we don't know the mechanism of this transformation. We don't know when a TBR becomes part of the brand reputation and when it is forgotten. Future research could study this transition and show the factors that are important in it. Finally, we have talked about the paradox of transitory resources and don't demonstrate whether this paradox is valid for all types of resources and crises. For instance, future research could investigate whether this paradox is valid for a product recall crisis and with other transitory resources. Another avenue for research is to investigate firms that have experienced two negative consequent crises and compare them with other similar firms that experienced similar crises but with a huge gap and observe the changing in firm value in both scenarios.

References

Afzal, H., Khan, M. A., ur Rehman, K., Ali, I., & Wajahat, S. (2010). Consumer's trust in the brand: Can it be built through brand reputation, brand competence and brand predictability. *International business research*, *3*(1), 43.

Agmeka, F., Wathoni, R. N., & Santoso, A. S. (2019). The influence of discount framing towards brand reputation and brand image on purchase intention and actual behaviour in e-commerce. *Procedia Computer Science*, *161*, 851-858.

Agrawal, J., & Kamakura, W. A. (1995). The economic worth of celebrity endorsers: An event study analysis. Journal of marketing, 59(3), 56-62.

Aqueveque, C., Rodrigo, P., & Duran, I. J. (2018). Be bad but (still) look good: Can controversial industries enhance corporate reputation through CSR initiatives?. *Business Ethics: A European Review*, *27*(3), 222-237.

Aryani, D. N., Singh, P., Liew, Y. W., Kee, D. M. H., Li, Y., Li, J., ... & Arif, W. (2021). How brand reputation influences customer satisfaction: A case study of Starbucks, Malaysia. *International journal of Tourism and hospitality in Asia Pasific (IJTHAP)*, *4*(3), 60-72.

Avery, A. (2021). After the disclosure: measuring the short-term and long-term impacts of data breach disclosures on the financial performance of organizations. *Information & Computer Security*, *29*(3), 500-525.

Avramov, D., Chordia, T., & Goyal, A. (2006). Liquidity and autocorrelations in individual stock returns. The Journal of finance, 61(5), 2365-2394.

Bae, J., Choi, W., & Lim, J. (2020). Corporate social responsibility: An umbrella or a puddle on a rainy day? Evidence surrounding corporate financial misconduct. *European Financial Management*, *26*(1), 77-117.

Basdeo, D. K., Smith, K. G., Grimm, C. M., Rindova, V. P., & Derfus, P. J. (2006). The impact of market actions on firm reputation. *Strategic Management Journal*, *27*(12), 1205-1219.

Beckers, S. F., Van Doorn, J., & Verhoef, P. C. (2018). Good, better, engaged? The effect of company-initiated customer engagement behavior on shareholder value. Journal of the Academy of Marketing Science, 46, 366-383.

Berrone, P., Fosfuri, A., & Gelabert, L. (2017). Does greenwashing pay off? Understanding the relationship between environmental actions and environmental legitimacy. Journal of Business Ethics, 144, 363-379.

Chen, Y., Ganesan, S., & Liu, Y. (2009). Does a firm's product-recall strategy affect its financial value? An examination of strategic alternatives during product-harm crises. *Journal of Marketing*, *73*(6), 214-226.

Choi, B. C., Kim, S. S., & Jiang, Z. (2016). Influence of firm's recovery endeavors upon privacy breach on online customer behavior. *Journal of Management Information Systems*, *33*(3), 904-933.

Cianci, A. M. (2008). The impact of investor status on investors' evaluation of negative and positive, separate and combined information. The journal of Behavioral finance, 9(3), 117-131.

Cleeren, K., Dekimpe, M. G., & Helsen, K. (2008). Weathering product-harm crises. *Journal of the Academy of Marketing Science*, *36*, 262-270.

Coombs, W. T. (2007). Protecting organization reputations during a crisis: The development and application of situational crisis communication theory. *Corporate reputation review*, *10*, 163-176.

Cowan, A. R. (1992). Nonparametric event study tests. Review of Quantitative Finance and Accounting, 2, 343-358.

Dawar, N., & Pillutla, M. M. (2000). Impact of product-harm crises on brand equity: The moderating role of consumer expectations. *Journal of marketing research*, *37*(2), 215-226.

De Leaniz, P. M. G., & del Bosque Rodríguez, I. R. (2016). Corporate image and reputation as drivers of customer loyalty. *Corporate Reputation Review*, *19*, 166-178.

Eilert, M., Jayachandran, S., Kalaignanam, K., & Swartz, T. A. (2017). Does it pay to recall your product early? An empirical investigation in the automobile industry. *Journal of Marketing*, *81*(3), 111-129.

Erkan, I., & Evans, C. (2016). The influence of eWOM in social media on consumers' purchase intentions: An extended approach to information adoption. *Computers in human behavior*, *61*, 47-55.

Ferguson, T. D., Deephouse, D. L., & Ferguson, W. L. (2000). Do strategic groups differ in reputation?. *Strategic management journal*, *21*(12), 1195-1214.

Ferreira, M., & Zambaldi, F. (2019). The mediating role of consumer engagement with the brand community and its effect on corporate reputation. *International Journal on Media Management*, *21*(1), 45-64.

Foerderer, J., & Schuetz, S. W. (2022). Data breach announcements and stock market reactions: a matter of timing?. *Management Science*, *68*(10), 7298-7322.

Fornell, C., Mithas, S., Morgeson III, F. V., & Krishnan, M. S. (2006). Customer satisfaction and stock prices: High returns, low risk. Journal of marketing, 70(1), 3-14.

Gao, H., Xie, J., Wang, Q., & Wilbur, K. C. (2015). Should ad spending increase or decrease before a recall announcement? The marketing–finance interface in product-harm crisis management. *Journal of Marketing*, *79*(5), 80-99.

Greyser, S. A. (2009). Corporate brand reputation and brand crisis management. *Management Decision*, *47*(4), 590-602.

Gwebu, K. L., Wang, J., & Wang, L. (2018). The role of corporate reputation and crisis response strategies in data breach management. *Journal of Management Information Systems*, *35*(2), 683-714.

Hirshleifer, D. (2001). Investor psychology and asset pricing. The journal of Finance, 56(4), 1533-1597.

Ho, B., Shin, W., & Pang, A. (2017). Corporate crisis advertising: A framework examining the use and effects of corporate advertising before and after crises. *Journal of Marketing Communications*, *23*(6), 537-551.

Homburg, C., Vollmayr, J., & Hahn, A. (2014). Firm value creation through major channel expansions: Evidence from an event study in the United States, Germany, and China. Journal of Marketing, 78(3), 38-61.

Hsu, L., & Lawrence, B. (2016). The role of social media and brand equity during a product recall crisis: A shareholder value perspective. *International journal of research in Marketing*, *33*(1), 59-77.

Im, K. S., Dow, K. E., & Grover, V. (2001). A reexamination of IT investment and the market value of the firm—An event study methodology. Information systems research, 12(1), 103-117.

Janakiraman, R., Lim, J. H., & Rishika, R. (2018). The effect of a data breach announcement on customer behavior: Evidence from a multichannel retailer. *Journal of marketing*, *82*(2), 85-105.

Joshi, A. M., & Hanssens, D. M. (2009). Movie advertising and the stock market valuation of studios: a case of "great expectations?". Marketing Science, 28(2), 239-250.

Kashmiri, S., Nicol, C. D., & Hsu, L. (2017). Birds of a feather: Intra-industry spillover of the Target customer data breach and the shielding role of IT, marketing, and CSR. *Journal of the Academy of Marketing Science*, *45*, 208-228.

Kelley, S. W., & Davis, M. A. (1994). Antecedents to customer expectations for service recovery. *Journal of the academy of Marketing Science*, *22*(1), 52-61.

Kiambi, D. M., & Shafer, A. (2016). Corporate crisis communication: Examining the interplay of reputation and crisis response strategies. *Mass Communication and Society*, *19*(2), 127-148.

Kim, S. K., McFarland, R. G., Kwon, S., Son, S., & Griffith, D. A. (2011). Understanding governance decisions in a partially integrated channel: A contingent alignment framework. *Journal of Marketing Research*, *48*(3), 603-616.

Kopalle, P. K., & Lehmann, D. R. (2006). Setting quality expectations when entering a market: What should the promise be?. *Marketing Science*, *25*(1), 8-24.

Lamey, L., Breugelmans, E., Vuegen, M., & ter Braak, A. (2021). Retail service innovations and their impact on retailer shareholder value: Evidence from an event study. Journal of the Academy of Marketing Science, 49, 811-833.

Langaro, D., Loureiro, S., Schivinski, B., & Neves, H. (2022). In the eye of the (fire) storm: better safe or sorry? Crisis communication strategies for managing virality of online negative brand-related content. Journal of Marketing Communications, 1-17.

Lin, C. P., Tsai, Y. H., & Chiu, C. K. (2009). Modeling customer loyalty from an integrative perspective of self-determination theory and expectation–confirmation theory. *Journal of Business and Psychology*, *24*, 315-326.

Liu, X. (2020). Analyzing the impact of user-generated content on B2B Firms' stock performance: Big data analysis with machine learning methods. Industrial marketing management, 86, 30-39.

Liu, Y., & Shankar, V. (2015). The dynamic impact of product-harm crises on brand preference and advertising effectiveness: An empirical analysis of the automobile industry. *Management science*, *61*(10), 2514-2535.

Liu, Y., Shankar, V., & Yun, W. (2017). Crisis management strategies and the long-term effects of product recalls on firm value. Journal of Marketing, 81(5), 30-48.

Luo, X., & Bhattacharya, C. B. (2009). The debate over doing good: Corporate social performance, strategic marketing levers, and firm-idiosyncratic risk. *Journal of marketing*, *73*(6), 198-213.

Lwin, M., Wirtz, J., & Williams, J. D. (2007). Consumer online privacy concerns and responses: a power–responsibility equilibrium perspective. *Journal of the Academy of Marketing Science*, *35*, 572-585.

MacKinlay, A. C. (1997). Event studies in economics and finance. Journal of economic literature, 35(1), 13-39.

Mahmood, A., & Bashir, J. (2020). How does corporate social responsibility transform brand reputation into brand equity? Economic and noneconomic perspectives of CSR. *International Journal of Engineering Business Management*, *12*, 1847979020927547.

Malhotra, A., & Kubowicz Malhotra, C. (2011). Evaluating customer information breaches as service failures: An event study approach. *Journal of Service Research*, *14*(1), 44-59.

Mansur, S., & Ali, H. (2017). Impact of customer engagement to reputation of the Bri Syariah Indonesia. *International Journal of Economic Research*, *14*(19), 425-431.

Martin, K. D., & Murphy, P. E. (2017). The role of data privacy in marketing. *Journal of the Academy of Marketing Science*, *45*, 135-155.

Martin, K. D., Borah, A., & Palmatier, R. W. (2017). Data privacy: Effects on customer and firm performance. *Journal of Marketing*, *81*(1), 36-58.

McWilliams, A., & Siegel, D. (1997). Event studies in management research: Theoretical and empirical issues. Academy of management journal, 40(3), 626-657.

Moisio, R., Capelli, S., & Sabadie, W. (2021). Managing the aftermath: Scapegoating as crisis communication strategy. *Journal of Consumer Behaviour*, *20*(1), 89-100.

Morgan, T., Obal, M., & Jewell, R. D. (2021). Strategic change and innovation reputation: Opening up the innovation process. *Journal of Business Research*, *132*, 249-259.

Mukherjee, A., & Chauhan, S. S. (2021). The impact of product recall on advertising decisions and firm profit while envisioning crisis or being hazard myopic. European Journal of Operational Research, 288(3), 953-970.

Mukherjee, A., Smith, R. J., & Turri, A. M. (2018). The smartness paradox: the moderating effect of brand quality reputation on consumers' reactions to RFID-based smart fitting rooms. *Journal of Business Research*, *92*, 290-299.

Nguyen, H., Calantone, R., & Krishnan, R. (2020). Influence of social media emotional word of mouth on institutional investors' decisions and firm value. Management Science, 66(2), 887-910.

O'brien, R. M. (2007). A caution regarding rules of thumb for variance inflation factors. Quality & quantity, 41, 673-690.

Ou, C. X., Zhang, X., Angelopoulos, S., Davison, R. M., & Janse, N. (2022). Security breaches and organization response strategy: Exploring consumers' threat and coping appraisals. *International Journal of Information Management*, *65*, 102498.

Pástor, Ľ., & Pietro, V. (2003). Stock valuation and learning about profitability. *The Journal of Finance*, *58*(5), 1749-1789.

Patell, J. M. (1976). Corporate forecasts of earnings per share and stock price behavior: Empirical test. Journal of accounting research, 246-276.

Pratt, J. W. (1978). Risk aversion in the small and in the large. In Uncertainty in economics (pp. 59-79). Academic Press.

Pullig, C., Netemeyer, R. G., & Biswas, A. (2006). Attitude basis, certainty, and challenge alignment: A case of negative brand publicity. *Journal of the Academy of Marketing Science*, *34*(4), 528-542.

Raithel, S., Mafael, A., & Hock, S. J. (2021). The effects of brand equity and failure severity on remedy choice after a product recall. Journal of product & brand management, 30(8), 1247-1261.

Raithel, S., Wilczynski, P., Schloderer, M. P., & Schwaiger, M. (2010). The value-relevance of corporate reputation during the financial crisis. Journal of Product & Brand Management, 19(6), 389-400.

Rasoolimanesh, S. M., Tan, P. L., Nejati, M., & Shafaei, A. (2021). Corporate social responsibility and brand loyalty in private higher education: mediation assessment of brand reputation and trust. *Journal of Marketing for Higher Education*, 1-22.

Rasoulian, S., Grégoire, Y., Legoux, R., & Sénécal, S. (2017). Service crisis recovery and firm performance: Insights from information breach announcements. *Journal of the Academy of Marketing Science*, *45*, 789-806.

Rasoulian, S., Grégoire, Y., Legoux, R., & Sénécal, S. (2021). The effects of service crises and recovery resources on market reactions: An event study analysis on data breach announcements. *Journal of Service Research*, *26*(1), 44-63.

Rosati, P., Deeney, P., Cummins, M., Van der Werff, L., & Lynn, T. (2019). Social media and stock price reaction to data breach announcements: Evidence from US listed companies. *Research in International Business and Finance*, *47*, 458-469.

Roy, G., Datta, B., Mukherjee, S., & Basu, R. (2021). Effect of eWOM stimuli and eWOM response on perceived service quality and online recommendation. *Tourism Recreation Research*, *46*(4), 457-472.

Rust, R. T., Rand, W., Huang, M. H., Stephen, A. T., Brooks, G., & Chabuk, T. (2021). Real-time brand reputation tracking using social media. *Journal of Marketing*, *85*(4), 21-43.

Selnes, F. (1993). An examination of the effect of product performance on brand reputation, satisfaction and loyalty. *European Journal of marketing*, *27*(9), 19-35.

Serra-Cantallops, A., Ramon-Cardona, J., & Salvi, F. (2018). The impact of positive emotional experiences on eWOM generation and loyalty. *Spanish Journal of Marketing-ESIC*, *22*(2), 142-162.

Sivakumar, K., Li, M., & Dong, B. (2014). Service quality: The impact of frequency, timing, proximity, and sequence of failures and delights. *Journal of Marketing*, *78*(1), 41-58.

Smith, K. T., Smith, M., & Wang, K. (2010). Does brand management of corporate reputation translate into higher market value?. Journal of Strategic Marketing, 18(3), 201-221.

Sohn, Y. J., & Lariscy, R. W. (2015). A "buffer" or "boomerang?"—The role of corporate reputation in bad times. *Communication Research*, *42*(2), 237-259.

Sorescu, A., Warren, N. L., & Ertekin, L. (2017). Event study methodology in the marketing literature: an overview. *Journal of the Academy of Marketing Science*, *45*, 186-207.

Sullivan, J. H., Warkentin, M., & Wallace, L. (2021). So many ways for assessing outliers: What really works and does it matter?. Journal of Business Research, 132, 530-543.

Swaminathan, V., Gupta, S., Keller, K. L., & Lehmann, D. (2022). Brand actions and financial consequences: A review of key findings and directions for future research. Journal of the Academy of Marketing Science, 50(4), 639-664.

Syed, R., & Dhillon, G. (2015). Dynamics of data breaches in online social networks: Understanding threats to organizational information security reputation.

Tandon, A., Aakash, A., & Aggarwal, A. G. (2020). Impact of EWOM, website quality, and product satisfaction on customer satisfaction and repurchase intention: moderating role of shipping and handling. *International Journal of System Assurance Engineering and Management*, *11*, 349-356.

Tipton, M. M., Bharadwaj, S. G., & Robertson, D. C. (2009). Regulatory exposure of deceptive marketing and its impact on firm value. *Journal of Marketing*, *73*(6), 227-243.

Tiwari, M. K. (2010). Separation of brand equity and brand value. *Global business review*, *11*(3), 421-434.

Todri, V., Adamopoulos, P., & Andrews, M. (2022). Is distance really dead in the online world? The moderating role of geographical distance on the effectiveness of electronic word of mouth. *Journal of Marketing*, *86*(4), 118-140.

Turjeman, D., & Feinberg, F. M. (2023). When the data are out: measuring behavioral changes following a data breach. *Marketing Science*.

Van Vaerenbergh, Y., Varga, D., De Keyser, A., & Orsingher, C. (2019). The service recovery journey: Conceptualization, integration, and directions for future research. *Journal of Service Research*, *22*(2), 103-119.

Wang, J. S., Wu, J. C. T., & Fu, H. H. (2010). The effect of service quality on perceived value, brand reputation and loyalty: a study on traveling industry. *Journal of Information and Optimization Sciences*, *31*(3), 659-677.

Warren, N. L., & Sorescu, A. (2017). When 1+ 1> 2: How investors react to new product releases announced concurrently with other corporate news. *Journal of Marketing*, *81*(2), 64-82.

Wei, J., Ouyang, Z., & Chen, H. (2017). Well known or well liked? The effects of corporate reputation on firm value at the onset of a corporate crisis. *Strategic Management Journal*, *38*(10), 2103-2120.

Wies, S., Hoffmann, A. O. I., Aspara, J., & Pennings, J. M. (2019). Can advertising investments counter the negative impact of shareholder complaints on firm value?. *Journal of Marketing*, *83*(4), 58-80.

Wiles, M. A., Jain, S. P., Mishra, S., & Lindsey, C. (2010). Stock market response to regulatory reports of deceptive advertising: The moderating effect of omission bias and firm reputation. *Marketing Science*, *29*(5), 828-845.

Wood, L. (2000). Brands and brand equity: definition and management. Management decision, 38(9), 662-669.

Woodroof, P. J., Deitz, G. D., Howie, K. M., & Evans, R. D. (2019). The effect of cause-related marketing on firm value: A look at Fortune's most admired all-stars. Journal of the Academy of Marketing Science, 47, 899-918.

Xiong, G., & Bharadwaj, S. (2013). Asymmetric roles of advertising and marketing capability in financial returns to news: Turning bad into good and good into great. *Journal of Marketing Research*, *50*(6), 706-724.

Xu, H. (2015). Is Brand Equity an Asset or a Liability in Brand Harm Crisis? Buffering and Amplifying Effects and Contingent Conditions.

You, Y., Vadakkepatt, G. G., & Joshi, A. M. (2015). A meta-analysis of electronic word-of-mouth elasticity. *Journal of Marketing*, *79*(2), 19-39.

Zablocki, A., Schlegelmilch, B., & Houston, M. J. (2019). How valence, volume and variance of online reviews influence brand attitudes. *Ams Review*, *9*, 61-77.

Zeithaml, V. A., Berry, L. L., & Parasuraman, A. (1993). The nature and determinants of customer expectations of service. *Journal of the academy of Marketing Science*, *21*, 1-12.

Zhang, J., & Du, M. (2020). Utilization and effectiveness of social media message strategy: how B2B brands differ from B2C brands. Journal of Business & Industrial Marketing, 35(4), 721-740.

Zhu, J. J., Tuo, L., You, Y., Fei, Q., & Thomson, M. (2023). EXPRESS: A Preemptive and Curative Solution to Mitigate Data Breaches: the Double-Layer of Protection from Corporate Social Responsibility. *Journal of Marketing Research*, 00222437231218969.