

# Corporate Social Irresponsibility, Media Coverage, and Stock Returns

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September 29, 2020

This paper develops from a chapter of Hee-Eun Kim's Ph.D. dissertation at Peking University.

# Corporate Social Irresponsibility, Media Coverage, and Stock Returns

## Abstract

Drawing upon behavioral sentiment theory and insurance theory, this paper examines the impact of increased investor awareness of corporate social irresponsibility (CSiR) on stock returns by showing that media coverage provides an important channel through which social media influences investor sentiment and awareness regarding CSiR. Using a unique research setting in Korea based on textual analysis, we find that investors exhibit short-term negative reactions to CSiR events. In addition, the increased social awareness and/or investor sentiment of CSiR issues through media coverage leads investors to penalize firms more severely. We also find that the negative reaction to CSiR events is larger for firms with greater negative media tone and greater surprise. The combined evidence is supportive of the behavioral sentiment theory. Furthermore, the negative effects of CSiR on stock returns are smaller for firms with a positive CSR reputation, consistent with insurance theory.

*JEL Classification:* M14, G14, G41, L82

*Keyword:* Corporate Social Irresponsibility (CSiR), Media coverage, Investor awareness, Stakeholder theory

## 1. INTRODUCTION

This paper aims to contribute to the literature on the implications of corporate social irresponsibility (CSiR) for stock returns and firm valuations. Specifically, the study focuses on the implications of media coverage on investor perception of CSiR incidences by using text analysis. This study is different from Ghoul, Guedhami, Nash, and Patel (2019) who examine the impact of media coverage on corporate social responsibility (CSR). This study is distinct from Ghoul et al. (2019) in that we focus not only on CSiR instead of CSR, but also examine the role of social media in the relation between CSiR and stock returns in Korea from the theoretical lens of behavioral sentiment theory and insurance theory.

We claim that with extensive news coverage, society in general and investors in particular, develops a higher level of investor awareness and sentiment of corporate wrongdoings, and that this shift in perception drives the higher negative stock price shock in the post-event period. Following the behavioral sentiment theory of Baker and Wugler (2006, 2007), Jo, Park, and Shefrin (2020), and Shefrin (2008), we maintain that media coverage

provides an important channel through which social media influences investor sentiment and awareness regarding CSiR.

Even though a growing number of various stakeholders consider corporate social responsibility (CSR) issues in their investment and evaluation decisions, they sometimes fail to penalize corporate misconduct—not only because investors do not properly consider CSR in their decision making but because they have insufficient attention to and recognition of irresponsible corporate behavior (Hoffman and Ocasio, 2001; Barnett, 2014<sup>1</sup>). Despite the lack of a common definition of CSiR, several “typical” irresponsible corporate activities are described in the academic literatures (Lin-Hi and Mueller, 2013). CSiR activities include fraud, price-fixing, and bribery (Davidson and Worrell, 1988; deMaCarty, 2009), unethical executive behaviors (Pearce and Manz, 2011), and environmental disasters (Sarre, Doig, and Fiedler, 2001).

To examine how investor reactions intensify with the increased social awareness of corporate misconduct, we use a unique research setting in Korea based on text analysis: the introduction of the new word *Gapjil* in 2013. *Gapjil* is a combination of the word “Gap” and the suffix “-jil,” which refers to an immoral or unethical action. The term *Gap* derives from the relationship between “Gap” and “Eul,” which are formal expressions used by the standard labor contract. In general, *Gap* is typically in a position as an employer who secures superior status, while *Eul* is an employee who is of lower status. *Gapjil*, more broadly, includes all unethical or immoral phenomena arising from *Gap* and *Eul* hierarchy. *Gapjil* refers to an abuse of power based on an imbalanced power relationship. In a corporate environment, *Gapjil* refers to irresponsible corporate social actions or corruptive practices, such as the unfair treatments of employees and suppliers, even though employees are one of the most important latent

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<sup>1</sup> Hoffman and Ocasio (2001) find that, due to limited attention, not all firms’ misconduct can be treated equally. Barnett (2011) explains that investors are inconsistent in punishing firm misconduct because cognitive processes— noticing, assessing and acting—vary across stakeholders.

stakeholders (Freeman, 1984). According to *The New York Times*, Gapjil indicates “the abuse of underlings and subcontractors by executives who behave like feudal lords<sup>2</sup>.” It can represent the illegal or unethical and immoral behaviors of a firm. For example, on December 5, 2014, Korean Airlines executive Cho Hyun-ah verbally and physically abused a flight attendant after he served her macadamian nuts in an unopened bag instead of on a plate and thus delayed the aircraft from taking off. This example, the so-called “nut rage incident,” received worldwide attention<sup>3</sup> and raised awareness of corporate misbehaviors.

To investigate the effect of investor awareness and sentiment, we first categorize the time periods as the *low social awareness period* (from 2008 to 2012) and the *high social awareness period* (from 2013 to 2017), as shown in Figure 1<sup>4</sup>. Second, we identify CSiR news samples. We use a news database that includes all media coverage of listed firms in Korea. We search for keywords relevant to Gapjil, such as *harassment, tyranny, bribe, unfair, detection, or fines*, as proxies for CSiR. We do not use the term *Gapjil* to find CSiR-relevant news articles because we intend to have a consistent sample selection methodology over the low and high social awareness periods. From 2008 to 2017, we construct a final sample of 182 CSiR events based on each event’s first announcement date.

We employ an event study methodology and find that the stock market reacts negatively to the announcement of CSiR events, consistent with existing literature (Davidson and Worrell, 1988; Flammer, 2013; Krüger, 2015). Specifically, during the low social

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<sup>2</sup> The New York Times, “Sister of Korean ‘Nut Rage’ Heiress Accused of Throwing Her Own Tantrum” Sang-Hun, Choe (2018-04-13)

<sup>3</sup> The “nut rage incident” was widely reported by the overseas news media because of the incident took place at John F. Kennedy International Airport in the United States. Even though the incident happened in the U.S. but it was firstly reported in the Korean local news (on December 8, 2014), and then reported in *The New York Times* (on December 18, 2014). Also, all Gapjil events except the Korean Airlines example happened domestically; thus we argue that high social awareness period is not a product of other events happening in other part of the world.

<sup>4</sup> There is a rising awareness of social issues around the world, and the changes always follow an upward long-term trend. However, the intensive media coverage about Gapjil was sufficient to cause investors’ outcry against corporate social irresponsibility, as shown in Figure 1.

awareness period, the three-day mean cumulative abnormal return (CAR) is -0.78% but not statistically significant. In contrast, during the high social awareness period, the three-day mean CAR is -0.95% and statistically significant. The results show that increased social awareness and investor sentiment of CSiR issues leads investors to punish firms to greater extent. In addition, using cross-sectional regression analysis, we find that the short-term negative reactions to CSiR news are larger when the tone of media coverage is highly negative and when the CSiR news is surprising due to the low probability of media coverage for firms. From the panel regression with an interaction term between CSiR and CSR, we find that the negative effects of CSiR on firm value are smaller for firms with a positive CSR reputation because of CSR's insurance-like benefits (Godfrey, 2005; Godfrey, Merrill, and Hansen, 2009; Shiu and Yang, 2017).

The remainder of this paper proceeds as follows. Section 2 briefly reviews the related literature and develop the hypotheses. Section 3 describes the data and methodology. Section 4 presents the empirical results. Section 5 discusses implications and section 6 concludes the paper.

## **2. LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT**

### **2.1 CSiR events and stock market reactions**

Prior literature suggests a link between CSR and firm value and general evidence is mixed. From the agency theory perspective, Friedman (1970) argues that companies should maximize shareholders' profit and that CSR can lead to inefficient distributions of corporate resources (Hong, Kubik, and Scheinkman, 2012; Cheng, Hong, and Shue, 2013; Masulis and Reza, 2014). In contrast, other studies suggest that CSR activities are positively related to firm value. Those studies include the following (Dowell, Hart, and Yeung, 2000; Orlitzky, Schmidt, and Rynes, 2003; Renneboog, Ter Horst, and Zhang, 2008, 2011; Jiao, 2010; Guenster, Bauer,

and Derwall, 2011; Edmans, 2011; Flammer, 2013; Servaes and Tamayo, 2013; Dimson, Karakaş, and Li, 2015; Ferrell, Liang, and Renneboog, 2016; Cui, Jo, and Na, 2018; Albuquerque, Koskinen, and Zhang, 2019). Although the findings are inconclusive, a growing body of literature suggests that CSR improves stakeholders' welfare and ultimately benefit shareholders as well as various stakeholders.<sup>5</sup>

The stakeholder value maximization view based on stakeholder theory (Freeman, 1984; Deng, Kang, and Low, 2013) provides a testable prediction: negative CSR activities are likely to have negative effects on firm value. For instance, Davidson and Worrell (1988) focus on five specific corporate crimes—bribery, criminal fraud, tax evasion, illegal political contributions, and price-fixing—and find that stock prices turn negative one day before the public disclosure of those crimes. Davidson, Worrell, and Cheng (1994) find that shareholders react negatively to the announcement of Occupational Safety and Health Administration (OSHA) sanctions.

The previous literature also finds that negative reactions to negative CSR events are much greater than positive reactions to positive CSR events. For example, Krüger (2015) illustrates that investors respond strongly negatively to negative CSR news but slightly negatively to positive CSR news. Similarly, Capelle-Blancard and Petit (2017) find that negative environmental, social, and governance (ESG) events generate significantly negative reactions, while positive ESG events have minimal impact on the firm's market value—negative CSR actions are more compelling and straightforward, whereas positive CSR actions are more diverse and indefinite (Matten and Moon, 2008; Murphy and Schlegelmilch, 2013).

Indeed, various stakeholders have long criticized companies for socially irresponsible corporate actions that often trigger immediate shareholder reactions (Davidson and Worrell,

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<sup>5</sup> For example, Edmans (2011) provides evidence that high employee satisfaction can generate superior long-run stock returns. Deng, Kang, and Low (2013) find that high CSR acquirers experience higher merger announcement returns and better post-merger operating performance. Cui et al. (2018) show that CSR engagement helps to reduce firm's information asymmetry and can enhance firm value through reduced conflict of interest between managers and stakeholders.

1988; Frooman, 1997; Flammer, 2013; Krüger, 2015). One of the most recent notable examples is the Volkswagen emission scandal (referred to as Dieselgate). On September 19, 2015, the U.S. Environmental Protection Agency (EPA) accused Volkswagen of installing illegal software to circumvent emissions control. The unethical practice of Volkswagen led to a dramatic decline in share price because it could face fines up to \$18 billion and a massive reduction in future car sales. During the week after the EPA's announcement, the stock price of Volkswagen plunged as much as 28.9% (from €167.4 to €118.9 per share), wiping out approximately €24.3 billion (\$26.4 billion) in market value.

However, irresponsible corporate behavior does not necessarily lead to salient investor reaction. For example, in 1998, American Honda Motor Company was involved in a similar situation for allegedly tampering with emission control devices. On June 9, 1998, Honda was subject to \$12.6 million in penalties, which was the largest civil penalty in Clean Air Act history before the Volkswagen case. Although the legal and economic consequences<sup>6</sup> of the irresponsible action were not insignificant compared to the Volkswagen case, the stock price of Honda Motor ADR on the NYSE stock exchange decreased only -1.65% and quickly recovered to its pre-incident level.

Another possible explanation for the varied response of Volkswagen and Honda can also be found from investor awareness and investor sentiment. Extensive negative media coverage of the Volkswagen scandal<sup>7</sup> may expand investor awareness and negative reactions toward irresponsible corporate practices<sup>8</sup> (Du, Bhattacharya, and Sen, 2010; Servaes and

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<sup>6</sup> Installed defeat devices affect approximately 584,000 Volkswagen diesel vehicles and 1.6 million Honda vehicles sold in the United States (Canis et al., 2016).

<sup>7</sup> Siano et al. (2017) use content analysis of the headlines on the top 25 U.S. daily newspapers (1,151 titles) relating to the Volkswagen scandal. They find that, in the month following the scandal (from September 18 to October 18, 2015), the most frequently cited five words are "scandal," "emissions," "diesel," "CEO," and "Cheating." In contrast, during the month before the scandal (from August 17 to September 17, 2015), the headlines contain a high frequency of terms related to marketing, such as "debut," "model," "technology," "car," and "prototype."

<sup>8</sup> The intensive media coverage of the Volkswagen scandal has also had significant consequences on the global automobile industry. During the one week after the EPA's announcement, the main competitors of Volkswagen experienced negative stock

Tamayo, 2013; Flammer, 2013; Kölbel, Busch, and Jancso, 2017), leading to adverse investor sentiment. Baker and Wurgler (2007) claim that some stocks are more vulnerable to being mispriced than others, stating: “stocks of low capitalization, younger, unprofitable, high-volatility, non-dividend paying, growth companies ... are likely to be disproportionately sensitive to broad waves of investor sentiment.” This statement implies that when investors become excessively optimistic (pessimistic) about stocks in general, they become even more optimistic (pessimistic) about stocks of small firms that, while not currently profitable, are perceived as holding great potential for future profitability (demise). Baker and Wurgler (2006, 2007), Jo, Park, and Shefrin (2020) and Shefrin (2008) describe stocks that are disproportionately sensitive to investor sentiment as featuring “high sentiment beta.” Following Baker and Wurgler’s investor sentiment theory, we maintain that investors tend to be more pessimistic around the announcement of CSiR events than around the announcement of CSR events. This effect is one form of the representativeness bias.

In South Korea, stakeholders have become aware of irresponsible corporate social actions especially since 2013, a beginning year of former-President, Park, Geun-hye’s regime. Anecdotal evidence suggests that extensive media coverage of Gapjil may amplify investor reactions to chronic social issues. For example, Namyang Dairy, one of Korea’s largest dairy companies, has a long-standing industry practice of forcing small retailers to purchase products from its headquarters. Namyang Dairy has commonly used this tactic to expand market share for a particular product. On May 4, 2013, news media uncovered this fact, and the stock market reacted rapidly. The three-day cumulative market-adjusted return<sup>9</sup> around the announcement

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market reactions: BMW -14.25%, General Motors -5.97%, Honda -4.31%, Toyota -3.24%. One possible reason for the industry-wide negative effect is that other firms potentially face penalties for failing to meet the stringent enforcement of environmental regulations. However, it is also possible that the extensive media coverage of the Volkswagen scandal may help shape investor awareness and sentiment of irresponsible corporate behavior of all auto manufacturers.

<sup>9</sup> We use daily KOSPI index for the market return.

day was -11.24%. On May 9, 2013, CEO Kim Woong and other executives issued a public apology for the scandal. Nonetheless, Namyang became the target of a nationwide boycott and received widespread social criticism. In fact, newspapers had reported the similar, but unfair practice on September 23, 2009, but the stock price decreased only marginally (the three-day cumulative market-adjusted return was -0.28%). Based on CSiR-return literature and recent Korean evidence, we expect the following:

*H1: Investors exhibit negative short-term reactions to the announcement of CSiR events.*

## 2.2 Increased social awareness and investor sentiment of CSiR issues

Concerning investor preference, socially- and environmentally-conscious investors prefer not to include weak CSR firms in their investment portfolios. Heinkel, Kraus, and Zechner (2001) build an equilibrium model and argue that exclusionary green investing leads to fewer investors holding positions in polluting firms. Consequently, polluting firms should offer non-green investors higher expected returns to compensate them for the risk-sharing. Empirically, Hong and Kacperczyk (2009) study “sin stocks” such as alcohol, tobacco, and gaming industries and find that norm-constrained institutional investors such as pension plans include fewer sin stocks in their portfolios compared to mutual funds and hedge funds.

We argue that social awareness and/or investor sentiment, rather than investor preference, is an important channel through which investor reactions can change. If investors are not aware of social issues, irresponsible corporate social behaviors cannot influence investors’ reactions to firms (McWilliams and Siegel, 2001; Du, Bhattacharya, and Sen, 2010; Servaes and Tamayo, 2013; Byun and Oh, 2018). Flammer (2013) highlights a general trend toward higher environmental consciousness over recent decades, with this higher external pressure amplifying shareholders’ negative reactions to announcements of eco-harmful behaviors. Servaes and Tamayo (2013) provide evidence that CSR is positively associated with

the value of firms with high consumer awareness, as proxied by advertising expense. Kölbel, Busch, and Jancso (2017) show that media coverage draws attention to CSiR and the severity of media coverage increases the impact of stakeholder sanctions. Similarly, Ghoul et al., (2019) provide evidence on the positive role of the media in CSR. These findings are related to our primary research objective to examine the reactions of investors who have a growing awareness/sentiment of CSiR issues. Investor sentiment theory would suggest that investors are likely to be more pessimistic around the CSiR announcement possibly due to the representativeness biases (Shefrin, 2000). Investors tend to make representativeness errors in financial markets. For instance, investors confuse a bad company with a bad investment. Firms with weak earnings, low sales growth and lack of quality management can represent bad companies. In contrast, bad investments are stocks that decrease in price more than other stocks. Thus, the stocks of bad companies are not necessarily bad investments (Solt and Statman, 1989). Together, these arguments lead to the following hypothesis:

*H2: Increased social awareness of CSiR issues leads investors to penalize firms to greater extent.*

### 2.3 The effect of media coverage

With increased social awareness, we further hypothesize that the negative impacts on CSiR events exhibit cross-sectional variations across firms. Media coverage directly affects how investors collect and process information (Barber and Odean, 2008; Engelberg and Parsons, 2011; Hillert, Jacobs and Mueller, 2014; Ghoul et al., 2019). In particular, the linguistic content of media coverage can capture market sentiment and have significant effects on stock returns (Tetlock, 2007; Loughran and McDonald, 2011; Jegadeesh and Wu, 2013; Krüger 2015; Ahmad et al., 2016). For instance, Tetlock (2007) examines the tone of the “Abreast of the Market” column in *The Wall Street Journal* and finds that decreases in stock price are associated with negative sentiment. Krüger (2015) applies textual analysis and finds

that investors react more strongly to CSR news containing strong economic and legal content. Accordingly, investors may evaluate the tone of CSiR news articles and incorporate the qualitative information into their reactions.

Social media are critical to driving public attention and investor sentiment (Soroka, 2003; Sampei and Aoyagi-Usui, 2009; Jo, Park, and Shefrin, 2020). Media coverage can influence public attention and investor sentiment on specific topics, such as foreign affairs (Soroka, 2003), climate change (Sampei and Aoyagi-Usui, 2009), and bitcoin pricing (Jo, Park, and Shefrin, 2020).

We use the number of news articles about Gapjil as a proxy for the magnitude of public awareness and investor sentiment of CSiR issues. The likelihood of media coverage can also affect firm value (Fang and Peress, 2009; Engelberg and Parsons, 2011). Highly-visible, larger firms tend to draw more media attention (Fang and Peress, 2009; Hillert and Ungeheuer, 2018). In contrast, small and neglected firms are less likely to be covered by the news media. In this respect, investors' reactions are far more sensitive to the news of the firms with greater surprise; thus, the investors' punishment for CSiR events can be more salient when the market can be characterized as the social misattribution of bad feelings to stock market pessimism. Baker and Wurgler (2006, 2007) suggest that the impact of investor sentiment will be more noticeable in the speculative stocks represented by small, young, volatile, unprofitable, distressed, or with high growth potential.

Furthermore, investors tend to pay more attention to credible media outlets. Dyck and Zingales (2003) find that the impact of the media on asset prices is greater when the newspaper is more reputable, such as *The Wall Street Journal*. The negative impacts of CSiR events on firm value can be amplified by news reported by the major news media. This argument leads to the following hypothesis:

*H3: Negative short-term reactions to CSiR news are larger for (a) firms with greater*

*negative media tone, (b) firms with greater surprise, and (c) firms with the major news media coverage.*

## 2.4 The reputational role of CSR

There are conflicting views on the reputational role of CSR. Firms with superior CSR reputations may face increased public expectations and experience a boomerang effect when irresponsible corporate behaviors violate investors' previous expectations (Luo, Meier, and Oberholzer-Gee, 2012; Nyilasy, Gangadharbatla, and Paladino, 2014; Oh, Bae, and Kim, 2017). For example, Luo, Meier, and Oberholzer-Gee (2012) and Ghoul et al. (2019) find that firms with superior CSR record are subject to greater media scrutiny and higher costs associated with failure.

In contrast, CSR activities prior to CSiR events can provide insurance-like benefits for firms against socially irresponsible behaviors (Godfrey, 2005; Godfrey, Merrill, and Hansen, 2009; Shiu and Yang, 2017). Firms that have positive reputations related to CSR experience fewer negative market reactions after the announcement of negative CSR news (Jones, Jones, and Little, 2000; Godfrey, 2005; Godfrey, Merrill, and Hansen, 2009; Flammer, 2013; Shiu and Yang, 2017). Consequently, we postulate that CSR can help protect firm value during difficult periods by functioning as a risk management strategy and providing insurance benefits. This insurance theory leads to the following hypothesis:

*H4: Negative effects of CSiR on firm value are smaller for firms with positive CSR reputation.*

## 3. DATA AND METHODOLOGY

### 3.1 CSiR events sample

We use an original news database provided by DeepSearch Data Intelligence (DeepSearch) that includes all media coverage of listed firms in Korea. DeepSearch

systematically collects and analyzes news articles, press releases, IR books, analyst reports, professional opinions, patent information, and credit information on more than 1.4 million Korean firms including over 2,600 Korea Exchange (KRX) listed companies. For each news article, we obtain a unique identification (UID), title, publisher, date and time of release, a summary of the article, name of the related firm, and stock code of the firm. The sample period is from January 1, 2008, to December 31, 2017.

To obtain our CSiR event sample, we use substitute keywords that can capture for Gapjil. The following keywords are categorized by (1) the type of the event, such as *harassment*, *tyranny*, *bribe*, *unfairness*, *detection*, or *penalty*, (2) the person who committed the irresponsible behaviors: the controlling shareholder or firm, and (3) the subject of irresponsible behaviors: supplier or employee. The complete list is provided in Appendix A. We do not use the term *Gapjil* to find CSiR-relevant news articles because we intend to use a consistent sample selection methodology for both the low and high social awareness periods. Notice that the word of *Gapjil* becomes prevalent in Korea since 2013, but not before 2013.

As illustrated in Figure 1, the number of news articles that mentioned “Gapjil” in the headline was nearly zero and remained stable from 2008 to 2012. In contrast, the number of news articles about Gapjil climbed in 2013 to 569 and increased more than 40 times in 2017 to 26,221. The percentage of news articles about Gapjil over the total number of news articles illustrates a similar trend.

[Insert Figure 1 about here]

The sample selection procedure is performed as follows. First, we collect 133,884 news items related to our keywords from the original news database provided by DeepSearch for the entire sample period. Second, to obtain reliable and influential news articles, we sort

news items by the seven major daily financial newspapers with nationwide circulation,<sup>10</sup> which reduced the list to 43,978 news reports. Third, we carefully read each news article and confirm that 1,313 news articles are related to CSiR. Because an event is sometimes reported by different news outlets repeatedly, we retain only one news item for each company for each event. Finally, our sample selection procedure yields 182 unique events associated with the first announcement date across 114 firms.<sup>11</sup> Panel A in Table 1 presents the sample selection procedure and Panel B and C present the number of CSiR events by type and year, respectively.

[Insert Table 1 about here]

For the firm-specific financial data, we use common stocks listed on the Korea Exchange (KRX) and exclude financial firms (two-digit Korea Standard Industrial Classification code 64–66).<sup>12</sup> Stock returns and financial data for the sample firms are obtained from the DataGuide database which provides comprehensive financial data in Korea. The market return is calculated as the value-weighted return of all firms listed on the KRX. The risk-free rate uses the one-year rate of a Monetary Stabilization Bond issued by the Bank of Korea.

## 3.2 Methodology and variables

### 3.2.1 Event study

We use an event study methodology to test H1 and H2. The event study methodology

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<sup>10</sup> Maeil Business Newspaper, Korean Economic Daily, Seoul Economic Daily, Asia Economic Daily, Money Today, Financial News, and Herald Economy

<sup>11</sup> Among 114 firms, 82 firms reported CSiR events one time, and 12, 5, 7, 5 and 1 firms reported CSiR events two, three, four, five and six times, respectively.

<sup>12</sup> We exclude financial firms in our sample because (1) they operate under different regulations and accounting system from firms in other industries, and (2) we need to maintain data consistency with Korea Economic Justice Institute (KEJI) CSR measures used in this paper. KEJI excluded financials when they evaluate Korean public firms until 2013 with the same reason above.

enables us to capture the short-term market reaction to the announcement of CSiR and exclude alternative explanations for changes in shareholder value (Krüger, 2015). We use a standard market model to calculate abnormal returns for each event window. For the estimation window, we use daily returns over periods between 250 and 21 days before the event date.<sup>13</sup> We calculate the CAR over periods of three (-1, 1) and eleven (-5, 5) days around the event day. Furthermore, to evaluate the stock market reaction after the news report, we extend the event periods to (1, 5), (1, 10), (1, 15), (1, 20) and (1, 30), respectively. To verify robustness, we also perform additional event studies using alternative asset-pricing models such as the CAPM, the Fama-French (1993, 1996) three-factor model, and the Carhart (1997) four-factor model. The event study methodology is described in Appendix C.

### 3.2.2 Cross-sectional regression: Media coverage

We further hypothesize that investor punishment for CSiR exhibits cross-sectional variations across firms as social awareness increases and/or investor sentiment changes. To examine the relationship between the short-term stock market reaction and media coverage variables related to the firm-event, we use the following specification:

$$CAR(-1, 1) = \alpha + \beta_1 X + \beta_2 CSR + \beta_3 Intensity + \beta_4 Controls + YearFE + \varepsilon \quad (1)$$

where CAR (-1, 1) is calculated as described in Section 3.2.1 during the high social awareness period. X represents variables related to media coverage: Polarity, Surprise, and Top3.

Polarity measures the tone of media coverage of CSiR news. Even though the dictionary-based approach is the most widely-used method in finance literature (Tetlock, 2007; Loughran and McDonald, 2011), it is not appropriate in this study due to the lack of reliable

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<sup>13</sup> We follow the methodology of Krüger (2015) which uses an estimation window of (-250, -50). We use slightly longer estimation window of (-250, -21) since we use shorter event window (e.g., (-5, 5)) than Krüger (2015) (e.g., (-10, 10)).

Korean natural-language-processing resources such (e.g., sentiment lexicon). Instead, we use machine-processed sentiment measures provide by DeepSearch. DeepSearch uses the convolutional neural network (CNN) model<sup>14</sup>, which processes entire news articles rather than words or phrases, to achieve greater predictive accuracy. Polarity ranges from [-1, +1], where -1 indicates negative news with the strongest confidence, and +1 indicates positive news with the strongest confidence. Polarity is calculated as the product of the *polarity label* and *polarity score*. The *polarity label* indicates the tone of the article. For example, a label is assigned -1 if the learning algorithm predicts firm-specific news with a negative tone, 0 if a neutral tone and +1 if a positive tone. The *Polarity score* ranges between 0 and 1 and indicates the confidence of the polarity. A value close to 1 indicates higher confidence. To present clear implications for the regression analysis, we change the sign of the value of Polarity.

Surprise is defined as (1 – probability of media coverage for CSiR news). For each firm, we calculate the likelihood of media coverage for CSiR news using the logit model for each firm. The variable construction methodology is as follows. From 2008 to 2017, we obtained 16,977 firm-year observations, including 168 firms that have at least one CSiR event reported by the news media (CSiR sample) and 16,837 firms that never had a CSiR event reported by the news media (Non-CSiR sample).

In the logistic regression, the dependent variable is assigned one of two outcomes: 1 = CSiR news reported and 0 = CSiR news not reported as below.

$$Prob(Y_i = 1) = \frac{1}{1 + \exp(-Z_i)}, \text{ where } Z_i = \alpha + \beta_1 \ln(Asset)_i + \beta_2 B2C_i + \beta_3 ROA_i + \beta_4 Growth_i + \beta_5 BM_i + \varepsilon_i, \quad (2)$$

where  $Y_i$  is assigned the value of 1 if firm  $i$  has CSiR news reported by the media and the

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<sup>14</sup> The CNN model was invented for image processing but has subsequently been demonstrated to be effective for detecting context sentiment. CNN uses convolutional layers to filter inputs for useful information. See “Deep Learning for Sentiment Analysis: A Survey” (2018). Available online: <https://arxiv.org/abs/1801.07883/>.

value of 0 otherwise. The explanatory variables include Ln (Asset), B2C, ROA, Growth, and BM. Because larger firms tend to be more visible and draw more media attention, we use firm size (Ln(Asset)) as a proxy for firm visibility. Ln (Asset) is calculated as the natural log of total assets at fiscal year-end immediately preceding the CSiR event. As business-to-customer (B2C) firms are more associated more significantly with greater consumer awareness and enhanced visibility, we include a B2C variable. B2C is a dummy variable equal to 1 if the industry is related to food and beverage, retail, apparel, accommodation, restaurants, entertainment, education, or consumer products (two-digit KSIC code as 10–15, 47, 55–60, 85–97). ROA is the ratio of operating income divided by assets at fiscal year-end immediately preceding the CSiR event. Growth is the average sales growth rate over the previous three years. BM is the ratio of the book value of common equity to the market value of equity at fiscal year-end immediately preceding the CSiR event. Book value of common equity is calculated as the book value of stockholder equity plus balance-sheet deferred taxes minus the book value of preferred stock.

Table 2 describes the characteristics of the Surprise variable and logit regression results to estimate the probability of media coverage of CRiR news. Table 2 Panel A presents the differences between the Non-CSiR and CSiR samples. The mean values of Ln (Asset), B2C, and ROA are larger for the CSiR sample, but the mean values of Growth and BM are smaller for the CSiR sample. Table 2 Panel B indicates that the estimated coefficients of the logit regression on Ln (Asset), B2C and ROA are positive and statistically significant at the 1% level. These results suggest that firms with a larger size, stronger consumer awareness, and higher profitability tend to be more visible and draw more media attention. In contrast, the estimated coefficient of the logit regression on BM is negative and statistically significant, implying that firms with low book-to-market ratio are more likely to be featured in the media. As presented in Table 2 Panel C, the mean probability of media coverage for the CSiR sample is 5.3%, nearly

six times higher than that of the Non-CSiR sample.

[Insert Table 2 about here]

Top3 is a dummy variable that is equal to 1 if a news article is reported by one of the top three (out of seven) major news outlets. The top three news outlets in Korea include Maeil Business Newspaper, Korean Economic Daily, and Money Today, based on circulation in the business category, as ranked by the Korea Audit Bureau of Certification (KABC) in 2017.

We include CSR to control for the effects of a firm's CSR engagement on short-term market reactions. Korea Economic Justice Institute (KEJI), a non-governmental organization, has published the top 200 companies based on CSR scores annually since 1991. KEJI evaluates Korean public firms against seven attributes of CSR activities: organizational integrity, justice, community service, customer satisfaction, environmental conservation, employee satisfaction, and economic development. The KEJI index is the most frequently used and reliable measure of CSR in Korea. In this paper, we define CSR as a dummy variable that is equal to 1 if a firm was listed among the top 200 companies of the KEJI index. Furthermore, to control for the severity of the media coverage of CSiR events, we include an Intensity variable to indicate the number of related news articles of each CSiR event on the event day.

We also control for firm size, book-to-market ratio, and momentum effects that can impact share value, following Fama and French (2015). Firm size is the natural log of the market value of equity on the event day. Book-to-market is the ratio of the book value of common equity at fiscal year-end immediately preceding the CSiR event to market value of common equity on the event day. Book common equity is calculated as the book value of stockholders' equity plus balance-sheet deferred taxes minus the book value of preferred stock. Momentum is calculated as the cumulative excess returns during the previous one month (21 trading days). We also include year fixed effects.

### 3.2.3 Panel regression: CSiR and CSR

To determine the interaction effects of CSiR and CSR on firm value, we use unbalanced panel data with the following specification:

$$\begin{aligned} \text{Tobin's } Q_{i,t} = & \alpha + \beta_1 \text{CSiR}_{i,t-1} + \beta_2 \text{CSR}_{i,t-1} + \beta_3 \text{CSiR}_{i,t-1} \times \text{CSR}_{i,t-1} + \beta_4 \text{Controls}_{i,t-1} \\ & + \text{IndustryFE} + \text{YearFE} + \varepsilon \quad (3) \end{aligned}$$

We use Tobin's  $Q$ <sup>15</sup> as a proxy for firm value to measure the long-term effect of CSR. Following Chung and Pruitt (1994) and Chung and Jo (1996), we compute Tobin's  $Q$  of firm  $i$  in year  $t$  as  $(\text{MVE} + \text{PS} + \text{BVINV} + \text{DEBT}) / \text{TA}$ . MVE is the year-end value of common equity, PS is the liquidation value of preferred stock, BVINV is the book value of inventory, DEBT is the book value of long-term debt plus current liabilities minus current assets, and TA is the book value of total assets. For the regression, we use the natural logarithm of Tobin's  $Q$ , winsorized at 1% and 99%. We use binary measures for CSiR and CSR. CSiR is a dummy variable that is equal to 1 if the firm had at least one CSiR events in a given year. CSR is a dummy variable that is equal to 1 if a firm was listed among the top 200 companies of the KEJI index. To verify robustness, when CSR is equals to 1, we use CSRS and Social variables. CSRS indicates the CSR score level of a firm ranked among the 200 companies in the KEJI index. Social represents the social components of the ESG rating. Korea Corporate Governance Service (KCGS), a semi-governmental organization, has publicly disclosed annual ESG ratings since 2011. KCGS publishes seven ESG ratings (S, A+, A, B+, B, C, and D). "S" indicates that a company conducts the best practices and "D" indicates that there is a high possibility of damaging shareholder value due to ESG risks. Since the number of firms above "A" is small

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<sup>15</sup> Jiao (2010) and Deng, Kang, and Low (2013) suggest the positive long-term effect of CSR on firm value. Also, KEJI publish CSR rankings annually, thus Tobin's  $Q$  is a more comparable measure of firm value than short-term stock market reactions (e.g., CARs).

and ESG rating lower than “B” is not disclosed, we rearrange ESG score into three ratings. We assign an ESG score of 2 (higher than or equal to A), 1 (equal to B+), or 0 (lower than or equal to B).

We include firm size, ROA, age, R&D, and Leverage as control variables. Firm size is the natural log of the market value of equity at year-end. ROA is the ratio of operating income divided by the total assets at fiscal year-end. Age is the natural log of the number of years since the company was established. R&D is the ratio of the firm’s R&D expense to total assets. Leverage is the ratio of a firm’s long-term debt to total assets. We also include industry and year fixed effects.

### 3.3 Summary statistics and bivariate correlations

Table 3A Panel A presents summary statistics for variables used in the event study and cross-sectional regression. For the entire sample period (from 2008 to 2017), the mean CAR (-1, 1) is -0.87% around the event day, consistent with the view that investors react negatively to CSiR events. More importantly, the mean CAR (-1, 1) is much lower from 2013 to 2017 (-0.95%) than from 2008 to 2012 (-0.78%). Furthermore, the standard deviation of CAR (-1, 1) is smaller from 2013 to 2017 (4.69%) than from 2008 to 2012 (5.11%). These results are consistent with the prediction that investor’s negative reactions are much larger and more salient during the high social awareness period. The mean value of Polarity is 0.74, which supports the assertion that CSiR news articles have mostly negative news sentiment. The mean value of Surprise is 0.94, and the value of Surprise varies between 0.72 and 1.00. Top3 occupies 48% of the sample, indicating that 88 of 182 events are reported by the top three news outlets. The mean CSR is 0.21, indicating that 38 of 182 firms were ranked in the top 200 companies of the KEJI index in a given year. The mean Intensity is 2.23 and varies between 1 and 25.

Table 3A Panel B presents summary statistics for variables used in the panel regression.

From 2013 to 2017, the sample has 1,837 firm-year observations and is comprised of 61 (3% of observations) CSiR and 485 (26% of observations) CSR firm-year observations<sup>16</sup>. The mean value of Ln (Tobin's Q) is -0.68 and the value lie between -10.55 and 1.34. The mean value of CSRS is 64.20, with a minimum value of 59.21 and a maximum of 71.14. The mean ESG rating is 0.31, implying that the rating is concentrated between B and B+. The definitions of all variables are provided in Appendix B.

[Insert Table 3A about here]

Table 3B Panels A report the correlations between CAR (-1, 1) and other variables. During the entire sample period (from 2008 to 2017), as shown in Panel A1, and during the low social awareness period (from 2008 to 2012), as shown in Panel A2, we do not observe a significant correlation between the CAR (-1, 1) and media coverage variables. In contrast, during the high social awareness period (from 2013 to 2017), as shown in Panel A3, the CAR (-1, 1) is significantly and negatively correlated with Polarity, Surprise and Top3. Panel B reports the correlations between firm value and other variables. The correlation between Ln (Tobin's Q) and CSiR is close to zero. As expected, the correlation coefficients between Ln (Tobin's Q) and CSR are positive and statistically significant at the 1% level. Social is most correlated with CSRS among ESG component variables, and also positively correlated with Ln (Tobin's Q). Firm size, ROA, R&D, and Leverage are significantly and positively associated with firm value, whereas Age is significantly and negatively associated with firm value.

[Insert Table 3B about here]

#### 4. EMPIRICAL RESULTS

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<sup>16</sup> When we replace binary CSR measure by top 100 companies (n=310, 16% of observations) or top 50 companies (n=161, 8% of observations) of the KEJI Index, the regression results are unchanged.

#### 4.1 CARs on CSiR news

Table 4 presents the cumulative abnormal returns over the different event windows around the day of the CSiR news announcement<sup>17</sup>. During the entire sample period (from 2008 to 2017), the mean CAR (-1, 1) and the mean CAR (-5, 5) around the event day are -0.87% ( $t$ -value = -2.42) and -1.63% ( $t$ -value = -2.81). The event study results support H1 that the stock market reacts negatively to announcements of CSiR events. Economically, given that the average market capitalization of the sample firms is KRW 7.79 trillion (approximately \$7.31 billion<sup>18</sup>), the average cost associated with CSiR events across 11-day is KRW 127 billion (\$119 million =  $0.0163 \times$  \$7.31 billion). This is consistent with the notion that socially irresponsible behavior is costly to firms (H1).

Next, to study how growing social awareness impacts investor reactions to CSiR, we re-run the event study for the two sub-sample periods: the low social awareness period (from 2008 to 2012) and the high social awareness period (from 2013 to 2017). As presented in Table 4, during the low social awareness period, the mean CAR (-1, 1) is -0.78% but statistically not significant from zero. With a longer event period, the mean CAR (-5, 5) exhibits a larger economic magnitude but is not statistically different from zero. During the high social awareness period, however, investors punish firms to greater extent than during the low social awareness period, and all results are statistically significant. The mean CAR (-1, 1) and CAR (-5, 5) are -0.95% ( $t$ -value = -2.04) and -1.72% ( $t$ -value = -2.52), and both are significant at the 5% level. Furthermore, CARs with longer event windows after the news reports also exhibit

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<sup>17</sup> We calculate the CARs around the event-final day but do not find significant results. Event-final day is the day of final settlement day of the event. For example, Korean Airlines was accused of unfair trade on June 25, 2009 (event-day). One year later, the Korea Fair Trade Commission (KFTC) imposed penalty of KRW 10.4 billion for Korean Airlines on August 10, 2010 (event-final day) but it was not reported by newspapers. We collected 29 event samples with event-final day. The event study results show that both CAR (-1, 1) and CAR (-5, 5) are not statistically significant for whole sample periods nor high social awareness periods.

<sup>18</sup> We use exchange rate \$1 = KRW1,065 as of December 31, 2017.

significant results. For example, the CAR (1, 10) is -1.47% and CAR (1, 15) is -1.72% and both are significant at the 5% level. However, the CAR (1, 30) is no longer statistically significant.

Figure 2 illustrates the trend in the CARs based on the market model from day -20 through day 30 around the CSiR event day. The stock price of a firm with CSiR events experiences a greater decrease during the high social awareness periods than during the low social awareness periods. These findings, together with the results in Table 4, firmly support H 2 that increased social awareness of the CSiR issues leads investors to punish firms to greater extent.

[Insert Table 4 about here]

[Insert Figure 2 about here]

#### 4.2 The impact of media coverage on short-term market reaction

Table 5 Column (1) presents the relationship between CAR (-1, 1) and Polarity in a univariate setting and illustrates that the coefficient estimate for Polarity is -1.99 and statistically significant (t-value = -2.27) at the 5% level. As shown with the control variables in Column (2), the coefficient estimate for Polarity is -1.69 and statistically significant (t-value = -2.02) at the 5% level. In terms of economic significance, Column (2) indicates that a one standard deviation increase in Polarity is associated with a 0.15 standard deviation decrease in predicted CAR, with other variables held constant. These results suggest that investors respond more intensely to strongly negative news (Krüger, 2015), consistent with H3a.

Table 5 Columns (3) and (4) indicate that the coefficient estimates for Surprise are -21.60 (t-value = -2.61) and -20.59 (t-value = -2.63) and statistically significant with and without control variables. Column (4) implies that a one standard deviation increase in Surprise leads to a 0.21 standard deviation decrease in CAR, with other variables held constant. These results are consistent with H3b that investors' punishment for CSiR events is larger for firms with

greater surprise.

Table 5 Columns (5) and (6) present the relationship between CAR (-1, 1) and Top3 with and without control variables. In both models, the coefficient estimates for Top3 are negative with weak significance. In terms of economic significance, Column (6) indicates that a one standard deviation increase in Top3 is associated with a 0.15 standard deviation decrease in CAR, with other variables held constant. These results are consistent with H3c that the negative impact of CSiR news on firm value can be amplified when the news is covered by the most influential and reliable news media.

[Insert Table 5 about here]

#### 4.3 The interaction effect of CSiR and CSR

First, we run Equation (2) without the CSiR and CSR interaction term to test whether CSiR has negative effects on firm value. As presented in Table 6 Columns (1) and (2), CSiR has a negative effect on firm value despite weak significance. As presented in Column (1), CSiR has a negative coefficient (-0.19) and statistically significant at the 10% level. After controlling for CSR in Column (2), CSiR also has a negative impact on firm value, whereas CSR does not exhibit a significant effect on firm value.

Column (3) in Table 6 shows that the coefficient of the interaction term between CSiR and CSR is 0.60 and statistically significant (t-value = 2.57) at the 5% level. The coefficient of CSiR also has a negative coefficient (-0.33) and statistically significant at the 1% level. This result implies that the negative effect of CSiR on firm value can be moderated by the positive effect of CSR on firm value. To verify robustness, we use CSRS as a substitute for CSR in Column (4) and find that the coefficient of the interaction term between CSiR and CSRS is 0.15 and statistically significant (t-value = 2.15) at the 5% level. We also use Social as a substitute for CSR in Column (5) and find similar results with weak significance. These findings are consistent with the notion that CSR can mitigate the negative effect of CSiR on

firm value by functioning as a risk management strategy and providing insurance benefits (Godfrey, 2005; Utting, 2005), consistent with H4 and insurance theory.

[Insert Table 6 about here]

#### 4.4 Robustness test

##### 4.4.1 Alternative asset pricing model

We rerun the event study using alternative asset pricing models: the CAPM model, the Fama-French (1993, 1996) three-factor model, and the Carhart (1997) four-factor model. As presented in Table 7 Panel A, the event study results are robust to the alternative asset pricing models. For example, during the entire sample period, the mean CAR (-1, 1) and CAR (-5, 5) by CAPM model are -0.84% (t-value = -2.33) and -1.51% (t-value = -2.60) and statistically significant at the 5% level. Moreover, the mean CAR (-1, 1) and CAR (-5, 5) exhibit larger economic magnitude during the high social awareness periods (-0.92% and -1.63%, respectively) than during the low social awareness periods (-0.73% and -1.37%, respectively). The CARs present similar results with the Fama-French (1993, 1996) three-factor model and Carhart (1997) four-factor models. The empirical results with alternative approaches are also consistent with H1 and H2.

##### 4.4.2 Controlling for sub-samples

We rerun the event study with different sub-samples and examine the robustness of our main results. Our main event study results are potentially affected by one particular CSiR news type—Fine—because it may have a stronger effect on firm value than any other type (Karpoff, Lott, and Wehrly, 2005; Lorraine, Collison, and Power, 2004; Davidson, Worrell and Cheng, 1994). As a robustness check, we calculate CARs without Fine (including Harassment, Tyranny, Bribe, Unfairness, and Detection). According to the results reported in Panel B in Table 7, the negative effects of CSiR events remain valid without Fine. For example, during the entire

sample period, the mean CAR (-5, 5) of Non-Fine is -1.55% (t-value = -2.31) and statistically significant at the 5% level. Furthermore, the mean CAR (-5, 5) of Non-Fine exhibits a larger economic magnitude during the high social awareness periods (-1.60%, t-value = -2.13) than during the low social awareness periods (-1.48%).

The magnitude of investors' reactions can differ depending on the repetition of the events. The repetition of similar events may intensify the market reaction (Baucus and Baucus, 1997; Davidson, Worrell, and Lee, 1994). In our sample, for example, Hyundai Mobis was fined two times in 2009 and 2012, and the CARs were 1.79%, and -3.54%, respectively. We verify whether the event study results are driven by the repetition of similar events or increased investors' social awareness or changed investor sentiment. To control for the impact of repetition of the event, we exclude sample firms that are reported more than twice with the same event type (n = 39) and retain the sample firms that are reported only once for each event type (n = 143). As presented in Panel C in Table 7, during the entire sample period, the mean CAR (-1, 1) and CAR (-5, 5) are -1.04% (t-value = -2.41) and -2.21% (t-value = -3.36) and statistically significant. During the low social awareness periods, the mean CAR (-1, 1) is -0.91% but not statistically significant. However, during the high social awareness periods, the mean CAR (-1, 1) is -1.13% and statistically significant at the 5% level.

Another potential driver of our main results is industry. B2C firms are more strongly associated with greater consumer awareness and visibility (McWilliams and Siegel, 2001; Servaes and Tamayo, 2013). As presented in Table 7 Panel D, we control for B2C firms and find that the event study results remain valid. For example, during the entire sample period, the mean CAR (-1, 1) is -0.89% (t-value = -2.78) and statistically significant at the 1% level. During the low social awareness periods, the mean CAR (-1, 1) is -0.74% but not statistically significant. However, during the high social awareness periods, the mean CAR (-1, 1) is -1.00% and statistically significant at the 5% level.

[Insert Table 7 about here]

#### 4.4.3 Controlling for media exposure

Short-term investor reaction may be impacted by media attention (Tetlock, 2007; Fang and Peress, 2009). To investigate the robustness of our results to the alternative media attention measure, we use a new variable of media exposure. Exposure is the natural log of the number of news articles from the seven major news outlets<sup>19</sup> for each firm within a year. Because firm size is highly correlated with the media attention (Fang and Peress, 2009),<sup>20</sup> we replace Size with Exposure in the regression model. As presented in Table 8, the coefficient estimates for Polarity, Surprise, and Top3 are negative despite weak significance.

[Insert Table 8 about here]

## 5. DISCUSSION

The contributions of this paper are as follows. First, to our knowledge, this is the first of its kind that links social awareness, investor sentiment and investor reactions to CSiR issues using Korean data and text analysis. If investors and stakeholders are not aware of social issues, irresponsible corporate social behaviors cannot influence their beliefs in and reactions to the firms (McWilliams and Siegel, 2001; Du, Bhattacharya, and Sen, 2010; Servaes and Tamayo, 2013; Byun and Oh, 2018). This paper is similar to the spirit of Flammer (2013), who finds that increased social awareness of environmental issues exacerbates investors' behavior over time. However, this paper differs from Flammer (2013) in three distinct aspects. (i) whereas Flammer examines the stock market reactions to the announcement of corporate news related

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<sup>19</sup> For data consistency, we use the same news outlets (Maeil Business Newspaper, Korean Economic Daily, Seoul Economic Daily, Asia Economic Daily, Money Today, Financial News, and Herald Economy) which are used in the CSiR sample selection procedure in Section 3.1

<sup>20</sup> In our sample data, the correlation coefficient between Exposure and Size is 0.77 and statistically significant at the 1% level.

to the environmental issues<sup>21</sup>, we focus on the market reactions to corporate social concerns or corporate misconduct, such as unfair treatment of employees and subcontractors. (ii) whereas Flammer simultaneously examines shareholder reaction to either positive or negative corporate behaviors, we focus on the shareholder response to firm's negative CSR events, i.e., CSiR based on the behavioral sentiment theory of Baker and Wugler (2006, 2007). (iii) whereas Flammer is mute regarding the direct cause of change in investor awareness and investor sentiment,<sup>22</sup> we compare and contrast the specific high and low social awareness and sentiment periods generated by Gapjil using text analysis.

Second, this paper uses media coverage to measure social awareness and sentiment because extensive media coverage on negative social issues can influence public perceptions and sentiment. Social issues cannot drive significant market reactions unless relevant information appears in the news media.<sup>23</sup> Accordingly, this paper provides evidence that media coverage is essential to strengthening investor awareness and sentiment of corporate misconduct. Because news media are highly sensitive to the emergence of new terms, we use the newly coined word *Gapjil* and investigate publicly observable CSiR events. This differs from the previous literature that used negative CSR indicators such as the Kinder, Lydenberg, and Domini (KLD) ratings (Hong, Kubik, and Scheinkman, 2012; Krüger, 2013; Servaes and Tamayo, 2013). Furthermore, this paper is distinct from the literature that investigates the relationship between media coverage and CSR (Luo, Meier, and Oberholzer-Gee, 2012; Cahan

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<sup>21</sup> Flammer (2013) identify environment-related keywords, such as “pollution,” “contamination,” “oil spill,” “hazardous waste,” “ecosystem preservation,” “recycling,” “emission,” or “global warming.”

<sup>22</sup> Flammer (2013) compares CARs with long and simple classification of the sample period—the first decade (from 1980 to 1989), the second decade (from 1990 to 1999), and the third decade (from 2000 to 2009)—and finds that the mean CARs and its significance is increasing over time.

<sup>23</sup> Corporate social issues such as such as unfair treatment of employees are not always associated with penalty for non-compliance, although employees are one of the most important latent stakeholders. In contrast, other issues such as environmental violations tend to be disciplined largely through legal and regulatory penalties (Karpoff and Lott, 1993; Karpoff, Lott, and Wehrly, 2005) and it causes a significant stock price reaction (Klassen and McLaughlin 1996; Lorraine, Collison, and Power, 2004).

et al., 2015; Ghoul et al., 2019). This paper further explores that cross-sectional variation in the media coverage of CSiR event (i.e., the tone of news reports and the probability of news coverage) and its impact on the short-term market movement using text analysis and Korean data. Korea is unique because it is somewhat between developed and developing country in the sense of corporate and governmental corruptions.

Third, this paper further investigates the interaction effect of CSiR and CSR. Previous studies have examined the impact of either positive or negative CSR events (Kruger, 2015; Capelle-Blancard and Laguna, 2010; Godfrey et al., 2009) on the firm value. CSR might be viewed as inherently subjective because CSR is a voluntary act conducted beyond legal requirements and there is no limit on “doing good” (Matten and Moon, 2008; Murphy and Schlegelmilch, 2013). In contrast, CSiR events are more straightforward and accessible to measure than CSR actions. Accordingly, after controlling for firm CSR performance, we provide evidence that CSiR has a significantly negative impact on stock returns and firm value, whereas CSR may not have a significant effect on firm value. Furthermore, by including the interaction term between CSiR and CSR, we can effectively measure the value implications of CSiR on firm value with varying levels of CSR. Only a few studies (Godfrey, 2005; Utting, 2005) find that CSR can moderate the negative effect of CSiR on firm value. Consequently, we provide local evidence in Korea that CSR can help protect the firm during difficult times by functioning as a risk management strategy.

However, this paper has a few limitations. First, sample size is somewhat small. Second, empirical measure of CSR is rather limited. We choose dummy variable of CSR mainly because our major focus in this paper is CSiR, not CSR. We only use CSR as a control variable. Third, although there could be a few other empirical proxies of investor sentiment, we use asymmetrical response of CSiR, CSR, and the interaction variable of CSiR and CSR as a rough measure of investor sentiment. While this paper has several limitations, we consider the

findings of this paper as a preliminary first step to understand the complicate nexus among CSiR, investor awareness/sentiment, media coverage, stock returns, and firm value. Future studies may use behavioral asset pricing models to examine the impact of CSiR on stock returns and firm value.

## 6. CONCLUSION

This paper provides empirical evidence that associates investor awareness of and reactions with corporate social irresponsibility (CSiR). More specifically, media coverage of corporate social issues raises investor awareness/sentiment and, consequently, influences investor behaviors.

We use a unique research setting in Korea. Since 2013, with the introduction of the new terminology, *Gapjil*—referring to power abuse based on the imbalanced power relationships—people have become more aware of irresponsible corporate social behaviors, corporate wrongdoings, misconduct, and corruptions. After categorizing the sample period into a low social awareness period (from 2008 to 2012) and a high social awareness period (from 2013 to 2017), we find that investors punish firms with CSiR events to greater extent during the high social awareness period. With increased social awareness, the short-term negative reactions to CSiR news is larger for firms with greater negative media tone, firms with greater surprise, and firms covered by highly reliable media outlets, supportive of the behavioral sentiment theory. Furthermore, former CSR reputation can mitigate the negative effect of CSiR on firm value by functioning as a risk management strategy, consistent with the insurance theory.

To our knowledge, this is the first paper to discover a relationship between social awareness/sentiment and investor reactions to CSiR issues. Unlike previous literature focusing on CSR activities, we provide evidence for behavioral sentiment and insurance theories by

focusing on CSiR events. This paper also contributes to existing studies that provide evidence on the shareholder value implications of ESG. More CSiR issues are expected to appear in the news media, creating a higher level of awareness that will drive firms to become better corporate citizens.

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## Appendix A. Keywords

	<b>Keywords</b>	<b>Supplementary words</b>
By type:	Harassment	verbal abuse, physical violence, assault
	Tyranny	compulsion, coercion
	Bribe	kickback, rebate
	Unfairness	unfair treatment, disadvantage, abuse of market power
	Detection	corrective order, exposure, uncover
	Fines	sanctions, penalty
By whom:	Controlling shareholder	chaebol, chairman, manager, CEO
	Company	organization
To whom:	Supplier	subcontractor, supplier, affiliate, subcontract, and franchise
	Employee	subordinate, staff

## Appendix B. Definitions of variables

Variable	Definition
<b>A. Variables used in the cross-sectional regression</b>	
CAR (-1, 1)	The cumulative abnormal return (CAR, in percentage) over a 3-day window centered on the event date. Abnormal returns are calculated using the market model.
Polarity	Polarity ranges from [-1, +1], where -1 indicates negative news with the strongest confidence and +1 indicates positive news with the strongest confidence. Polarity is calculated as the product of the polarity label and polarity score. The polarity label indicates the tone of the article. For example, a label is assigned -1 if the learning algorithm predicts firm-specific news with a negative tone, 0 if a neutral tone and +1 if a positive tone. The Polarity score ranges between 0 and 1, and indicates the confidence of the polarity. A value close to 1 indicates higher confidence. To present clear implications for the regression analysis, we change the sign of the value of Polarity.
Surprise	Calculated as $(1 - \text{probability of media coverage for CSiR news})$ . The probabilities of media coverage for CSiR news is calculated by the following logit model equation: $\text{Prob}(Y_i = 1) = 1 / (1 + \exp(-Z_i))$ , where $Z_i = \alpha + \beta_1 \text{Ln}(\text{Asset})_i + \beta_2 \text{B2C}_i + \beta_3 \text{ROA}_i + \beta_4 \text{Growth}_i + \beta_5 \text{BM}_i + \varepsilon_i$ , where $Y_i$ is assigned the value of 1 if firm $i$ is reported in CSiR news and the value 0 otherwise.
Top3	A dummy variable that equals to 1 if a news article is reported by the top three news media outlets (Maeil Business Newspaper, Korean Economic Daily, and Money Today).
CSR	CSR is a dummy variable that is equal to 1 if a firm was listed in the top 200 companies of the KEJI index.
Intensity	The number of related news articles on the event day
Exposure	The number of news article from the seven major daily newspapers for each firm within a year.
Size	The natural log of market value of equity on the CSiR event day.
Book-to-market	The ratio of book value of common equity at fiscal year-end immediately preceding the CSiR event to market value of equity on the event day. Book value of common equity is calculated as book value of stockholders' equity plus balance-sheet deferred taxes minus the book value of preferred stock.
Momentum	The cumulative excess returns over the past one month (21 trading days) before the CSiR event day (in percentage).
<b>B. Variables used in the panel regression</b>	
CSiR	A dummy variable that is equal to 1 if the firm had at least one CSiR events in a given year.
CSR	A dummy variable that is equal to 1 if a firm was listed among the top 200 companies of the Korea Economic Justice Institute (KEJI) index.
CSRS	The CSR score of firms listed among the top 200 companies of the KEJI index.
ESG	ESG ratings published by Korea Corporate Governance Service (KCGS). We assign score of 2 (higher than or equal to A), 1(equal to B+), and 0 (lower than or equal to B).
Environmental	The Environmental component of the ESG rating.
Social	The Social component of the ESG rating.
Governance	The Governance component of the ESG rating.
Size	The natural log of market value of equity at year-end.
ROA	The ratio of operating income divided by the total assets at fiscal year-end.
Age	The natural log of the number of years since the company was established
R&D	The ratio of the firm's R&D expense to total assets.
Leverage	The ratio of a firm's long-term debt to total assets.
<b>C. Other variables</b>	
Industry	Two-digit Korea Standard Industrial Classification (KSIC) code
B2C	A dummy variable that equals to 1 if the two-digit industry code is related to food and beverage, retail, apparel, accommodation, restaurants, entertainment, education, or consumer product (KSIC codes 10–15, 47, 55–60, 85–97).
Ln (Asset)	The natural log of total assets at fiscal year-end immediately preceding the CSiR event.
ROA	The ratio of operating income divided by assets at fiscal year-end immediately preceding the CSiR event (in percentage).
Growth	The average sales growth rate over the previous three years (in percentage).

## Appendix C. Event study methodology

According to Brown and Warner (1985) and Kothari and Warner (1997), we use a market model to calculate abnormal returns. For the estimation window, we use daily returns for -250 to -21 days before the event date. The abnormal return for stock  $i$  and day  $t$  is

$$AR_{it} = R_{it} - \alpha_i - \beta_i R_{mt},$$

where  $R_{it}$  is the daily return of stock  $i$  on day  $t$ , and  $\alpha_i$  and  $\beta_i$  are market model parameter estimates obtained by regressing daily returns for stock  $i$  on the market returns  $R_{mt}$ . Mean abnormal return ( $MAR_{it}$ ) and cumulative mean abnormal return ( $CAR_t$ ) are calculated as,

$$MAR_{it} = \frac{1}{N} \sum_{i=1}^N AR_{it},$$

and

$$CAR_{T1,T2} = \frac{1}{N} \sum_{t=T1}^{T2} MAR_{it},$$

where  $N$  is the number of events and  $t$  is each event windows (T1, T2). We not only calculate the CAR over the three (-1, 1) and eleven (-5, 5) days around the event day, but also over an extended period after the event day, such as (1, 5), (1, 10), (1, 15), (1, 20) and (1, 30).

For the robustness test, we use the alternative asset pricing models. The abnormal returns using the CAPM model, the Fama-French (1993, 1996) three-factor model and the Carhart (1997) four-factor model are

$$CAPMAR_{it} = R_{it} - R_{ft} - \beta_i (R_{mt} - R_{ft}),$$

$$FF3AR_{it} = R_{it} - R_{ft} - \beta_i (R_{mt} - R_{ft}) - s_i SMB_t - h_i HML_t,$$

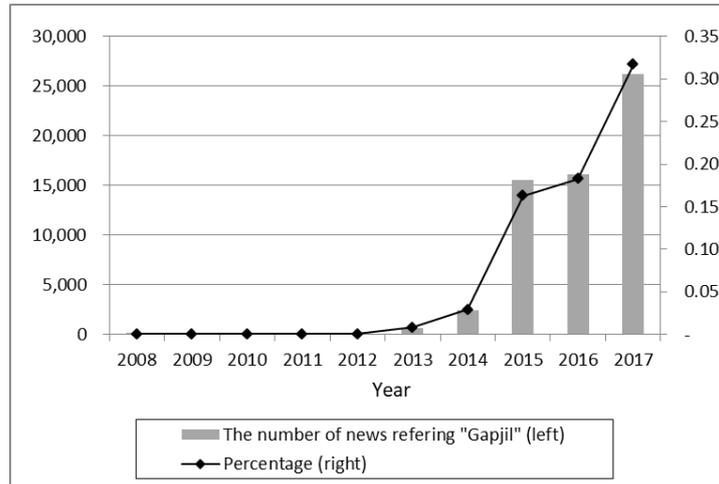
and

$$CAFAR_{it} = R_{it} - R_{ft} - \beta_i (R_{mt} - R_{ft}) - s_i SMB_t - h_i HML_t - u_i UMD_t,$$

where  $R_{it}$  is the daily return of the firm,  $R_{ft}$  is the risk-free rate and  $R_{mt}$  is the market return.  $SMB_t$  is the return on a portfolio of small stocks minus the return on a portfolio of large stocks, and  $HML_t$  is the return on a portfolio of stocks with high book-to-market ratios minus the return on a portfolio of stocks with low book-to-market ratios.  $UMD_t$  is the return on a portfolio of stocks with high return minus the return on a portfolio of stocks with low return. Mean abnormal return ( $MAR_{it}$ ) and cumulative mean abnormal return ( $CAR_t$ ) follow the same methodology.

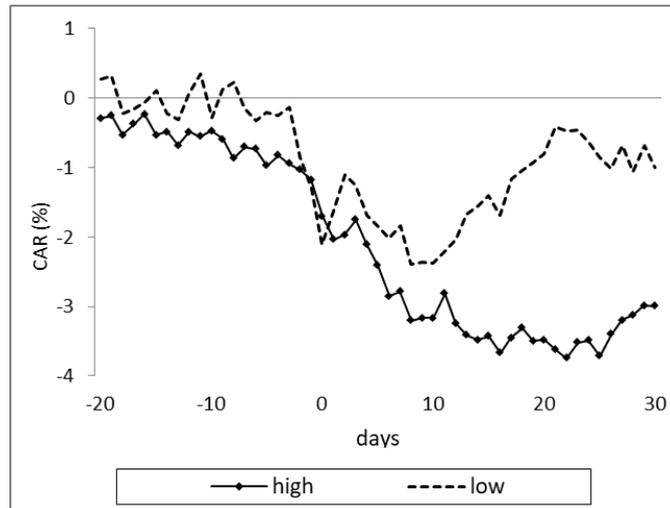
**Figure 1. Number of Gapjil news articles**

This figure plots the number of news articles referring to “Gapjil” in the news title (left) and the percentage of the number of news referring to “Gapjil” on the news title relative to the total number of news articles (right) per year from 2008 to 2017. The news database is provided by DeepSearch, which have historical newspaper content all media coverage of listed firms in Korea.



**Figure 2. CARs by sub-sample period**

This figure illustrates the cumulative abnormal return (CAR, in percentage) based on the market model from day -20 to day 30 around the CSiR event day. We categorize the sample period into two sub-sample periods: low social awareness period (2008-2012) and high social awareness period (2013-2017). We use a market model to calculate CAR. For the estimation window, we use daily returns over the period (-250 to -21) where the event day is defined as the first news report day. The event study methodology is provided in Appendix C.



**Table 1. CSiR event sample description**

This table presents the CSiR event samples. Panel A presents the sample selection procedure for CSiR events. Panel B and Panel C present the number of CSiR events by type and year, respectively.

<b>Panel A. Sample selection procedure</b>											
	<b>2008–2017</b>			<b>2008–2012</b>			<b>2013–2017</b>				
1. Total number of news-related keywords	133,884			63,198			70,686				
2. News articles from major financial news media	43,978			22,927			21,051				
3. CSiR-related news articles	1,313			557			756				
4. Unique CSiR events	182			81			101				
5. Sample firms	114										
<b>Panel B. Number of CSiR events by type</b>											
	<b>2008–2017</b>			<b>2008–2012</b>			<b>2013–2017</b>				
Harassment	7			0			7				
Tyranny	23			11			12				
Bribe	22			10			12				
Unfairness	37			16			21				
Detection	43			20			23				
Fine	50			24			26				
Total	182			81			101				
<b>Panel C. Number of CSiR events by year</b>											
	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	Total
	18	28	5	17	13	29	23	20	14	15	182

**Table 2. The probability of media coverage of CRiR news estimated by logit regressions**

This table presents the probability of media coverage of CSiR news. Panel A presents descriptive statistics of the CSiR and Non-CSiR samples with the number of firm-year observations, mean, and standard deviation. Panel B shows the estimation results of the logit regression. Panel C describes the estimated probability of media coverage. Ln(Asset) is calculated as the natural log of the total assets at fiscal year-end immediately preceding the CSiR event. B2C is a dummy variable that is equal to 1 if the two-digit industry code is related to food and beverage, retail, apparel, accommodation, restaurants, entertainment, education, or consumer product. ROA is the ratio of operating income divided by the total assets at fiscal year-end immediately preceding the CSiR event (in percentage). Growth is average sales growth rate over the previous three years (in percentage). BM is the ratio of book value of common equity to market value of equity at fiscal year-end immediately preceding the CSiR event. Book value of common equity is calculated as book value of stockholder's equity plus balance-sheet deferred taxes minus the book value of preferred stock. \*, \*\*, and \*\*\* denote significance at the 10%, 5% and 1% levels, respectively.

<b>Panel A. Descriptive statistics of the CSiR and Non-CSiR samples</b>						
	<b>Non-CSiR sample</b>			<b>CSiR sample</b>		
	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>
Ln(Asset)		19.053	1.647		21.679	2.158
B2C		0.146	0.353		0.250	0.434
ROA (%)		3.150	9.993		6.699	8.132
Growth (%)		24.237	222.684		13.289	27.226
BM		1.352	2.053		1.288	1.277
	16809			168		

<b>Panel B. Logit regression result</b>		
	<b>Coefficient</b>	<b>Wald test value (z)</b>
Ln(Asset)	0.6147***	17.62
B2C	1.0438***	5.45
ROA	0.0499***	4.28
Growth	-0.0030	-1.13
BM	-0.1399*	-1.77
_cons	-17.2794***	-22.31
N	16977	

<b>Panel C. Estimated probability by logit regression</b>						
	<b>Non-CSiR sample</b>			<b>CSiR sample</b>		
	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>
Prob.	16809	0.009	0.021	168	0.053	0.057

**Table 3A. Descriptive Statistics**

This table provides summary statistics. Panel A presents descriptive statistics for variables used in the cross-sectional regression for different period: 2008–2017, 2008–2012, and 2013–2017. CAR is the cumulative abnormal return (in percentage) over a 3-day window based on the market model. Polarity ranges from [-1, +1], where -1 indicates negative news with the strongest confidence and +1 indicates positive news with the strongest confidence. We change the sign of the value of Polarity to present clear implications. Surprise is defined as  $(1 - \text{probability of media coverage for CSiR news})$ . We calculate the possibilities of media coverage for CSiR news by using the logit model. Top3 is a dummy variable that is equal to 1 if a news article is reported by one of the top three news media. CSR is a dummy variable that is equal to 1 if a firm was listed among the top 200 companies of the KEJI index. Intensity indicates the number of related news articles on the event day. Size is the natural log of market value of equity on the CSiR event day. Book-to-market is the ratio of book value of common equity at fiscal year-end immediately preceding the CSiR event to market value of equity on the event day. Momentum is the cumulative excess returns over the past one month (21 trading days) before the CSiR event day (in percentage). Panel B presents descriptive statistics for variables used in the panel regression. Tobin's Q is calculated as  $(MVE + PS + BVINV + DEBT) / TA$ , where MVE is the year-end value of common equity, PS is the liquidation value of preferred stock, BVINV is the book value of inventory, DEBT is the book value of long term debt plus current liabilities minus current assets, and TA is the book value of total assets. For the regression, we take the natural logarithm of Tobin's Q, winsorized at 1% and 99%. CSiR is a dummy variable that is equal to 1 if the firm had at least one CSiR events in a given year. CSR is a dummy variable that is equal to 1 if a firm was listed among the top 200 companies of the KEJI index and CSRS indicates the CSR score level of the firm. ESG indicates ESG ratings published by Korea Corporate Governance Service (KCGS) and we assign a score of 2 (higher than or equal to A), 1 (equal to B+), and 0 (lower than or equal to B). Environmental, Social, and Governance are components of ESG.

<b>Panel A. Variables used in the cross-sectional regression</b>															
	<b>2008-2017</b>					<b>2008-2012</b>					<b>2013-2017</b>				
	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
CAR	182	-0.87	4.86	-32.02	12.26	81	-0.78	5.11	-25.49	12.26	101	-0.95	4.69	-32.02	9.25
Polarity	182	0.74	0.40	0.00	1.00	81	0.74	0.38	0.00	1.00	101	0.74	0.41	0.00	1.00
Surprise	177	0.94	0.06	0.73	1.00	79	0.94	0.07	0.73	1.00	98	0.95	0.05	0.78	1.00
Top3	182	0.48	0.50	0.00	1.00	81	0.46	0.50	0.00	1.00	101	0.50	0.50	0.00	1.00
CSR	182	0.21	0.41	0.00	1.00	81	0.27	0.45	0.00	1.00	101	0.17	0.38	0.00	1.00
Intensity	182	2.23	2.37	1.00	25.00	81	2.09	1.71	1.00	9.00	101	2.34	2.80	1.00	25.00
Size	181	14.26	2.08	9.29	19.02	81	14.02	2.39	9.29	19.02	100	14.46	1.78	10.19	17.17
Book-to-market	181	1.18	1.05	0.05	6.78	81	1.34	1.25	0.05	6.78	100	1.05	0.84	0.09	5.55
Momentum	181	-0.51	11.36	-43.11	46.13	81	-0.40	11.61	-37.42	28.89	100	-0.59	11.21	-43.11	46.13

<b>Panel B. Variables used in the panel regression</b>					
	<b>N</b>	<b>Mean</b>	<b>SD</b>	<b>Min</b>	<b>Max</b>
Ln(Tobin's Q)	1,837	-0.68	0.87	-10.55	1.34
CSiR	1,837	0.03	0.18	0.00	1.00
CSR	1,837	0.26	0.44	0.00	1.00
CSRS	485	64.20	2.27	59.21	71.14
ESG	485	0.31	0.59	0.00	2.00
Environmental	485	0.47	0.64	0.00	2.00
Social	485	0.40	0.68	0.00	2.00
Governance	485	0.28	0.54	0.00	2.00
Size	1,837	12.83	1.71	9.03	19.69
ROA	1,837	3.67	6.41	-44.68	35.35
Age	1,837	3.52	0.66	1.39	4.62
R&D	1,837	0.02	0.03	0.00	0.37
Leverage	1,837	0.87	2.85	0.00	43.13

**Table 3B. Pearson correlations**

This table presents the Pearson correlations. Panel A presents correlations between variables used in the cross-sectional regression for different period: 2008–2017, 2008–2012, and 2013–2017. Panel B presents correlations between variables used in the panel regression. The definitions of all variables are provided in Appendix B. Correlations in \*, \*\*, and \*\*\* denote significance at the 10%, 5% and 1% levels, respectively.

<b>Panel A. Variables used in the cross-sectional regression</b>									
<b>A1. 2008-2017</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>	<b>(9)</b>
(1) CAR	1.00								
(2) Polarity	-0.06	1.00							
(3) Surprise	-0.08	-0.06	1.00						
(4) Top3	-0.10	-0.16**	-0.06	1.00					
(5) CSR	0.02	-0.09	-0.20***	-0.07	1.00				
(6) Intensity	-0.01	0.02	-0.20***	0.04	0.13*	1.00			
(7) Size	0.07	-0.03	-0.76***	0.08	0.24***	0.21***	1.00		
(8) Book-to-market	0.09	0.03	0.08	0.01	-0.16**	-0.09	-0.31***	1.00	
(9) Momentum	0.02	-0.05	0.03	0.04	0.05	0.07	0.04	0.00	1.00
<b>A2. 2008-2012</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>	<b>(9)</b>
(1) CAR	1.00								
(2) Polarity	0.08	1.00							
(3) Surprise	0.04	-0.10	1.00						
(4) Top3	-0.02	-0.23**	-0.02	1.00					
(5) CSR	-0.01	-0.02	-0.32***	-0.12	1.00				
(6) Intensity	0.17	0.24**	-0.36***	0.01	0.06	1.00			
(7) Size	-0.08	0.06	-0.84***	0.09	0.32***	0.40***	1.00		
(8) Book-to-market	0.09	0.06	0.25**	0.00	-0.16	-0.17	-0.42***	1.00	
(9) Momentum	0.15	-0.01	0.01	0.14	0.04	0.17	0.03	0.11	1.00
<b>A3. 2013-2017</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>	<b>(9)</b>
(1) CAR	1.00								
(2) Polarity	-0.17*	1.00							
(3) Surprise	-0.23**	-0.03	1.00						
(4) Top3	-0.17*	-0.10	-0.10	1.00					
(5) CSR	0.05	-0.13	-0.08	-0.03	1.00				
(6) Intensity	-0.10	-0.07	-0.14	0.06	0.17*	1.00			
(7) Size	0.24**	-0.12	-0.69***	0.06	0.19*	0.10	1.00		
(8) Book-to-market	0.10	-0.01	-0.14	0.02	-0.19*	-0.02	-0.09	1.00	
(9) Momentum	-0.11	-0.08	0.07	-0.05	0.06	0.02	0.05	-0.14	1.00

<b>Panel B. Variables used in the panel regression</b>													
<b>Variables</b>	<b>(1)</b>	<b>(2)</b>	<b>(3)</b>	<b>(4)</b>	<b>(5)</b>	<b>(6)</b>	<b>(7)</b>	<b>(8)</b>	<b>(9)</b>	<b>(10)</b>	<b>(11)</b>	<b>(12)</b>	<b>(13)</b>
(1) Ln (Tobin's Q)	1.00												
(2) CSiR	0.00	1.00											
(3) CSR	0.06***	-0.01	1.00										
(4) CSRS	0.15***	0.13***	.	1.00									
(5) ESG	0.03	0.16***	.	0.21***	1.00								
(6) Environmental	-0.05	0.12***	.	0.16***	0.75***	1.00							
(7) Social	0.07*	0.17***	.	0.22***	0.79***	0.63***	1.00						
(8) Governance	0.09*	0.16***	.	0.20***	0.72***	0.42***	0.51***	1.00					
(9) Size	0.10***	0.24***	0.04	0.28***	0.60***	0.55***	0.63***	0.48***	1.00				
(10) ROA	0.09***	0.06***	0.19***	0.13***	0.03	0.04	0.09**	0.03	0.38***	1.00			
(11) Age	-0.12***	-0.10***	0.03	-0.12***	-0.16***	-0.12**	-0.17***	-0.15***	-0.07***	-0.07***	1.00		
(12) R&D	0.26***	0.08***	0.11***	0.23***	0.08*	0.01	0.10**	0.12***	0.19***	0.10***	-0.12***	1.00	
(13) Leverage	0.13***	0.00	0.06***	0.14***	0.11**	0.08*	0.09*	0.15***	0.07***	-0.01	-0.00	0.13***	1.00

Note: Since we use CSR proxy variables (i.e., CSRS, ESG, Environmental, Social, and Governance) when CSR is equals to 1, the correlations between CSR and the CSR proxy variables are omitted in the table.

**Table 4. CARs on CSiR news**

This table presents cumulative abnormal returns (CAR, in percentage) around the CSiR events. We calculate CARs during the entire sample period (2008-2017) and categorize the sample period into two sub-sample periods: low social awareness period (2008-2012) and high social awareness period (2013-2017). We use a market model to calculate CARs. For the estimation window, we use daily returns over the period (-250 to -21) where the event day is defined as the first news report day. The event study methodology is provided in Appendix C. \*, \*\*, and \*\*\* denote significance at the 10%, 5% and 1% levels, respectively.

	Entire sample (2008-2017)		Low social awareness (2008-2012)		High social awareness (2013-2017)	
	CAR	t-value	CAR	t-value	CAR	t-value
(-1, 1)	-0.8728**	-2.42	-0.7766	-1.37	-0.9499**	-2.04
(-5, 5)	-1.6342***	-2.81	-1.5243	-1.53	-1.7223**	-2.52
(-5, -1)	-0.6644*	-1.68	-0.9743	-1.50	-0.4158	-0.85
(1, 5)	-0.3588	-0.92	0.0746	0.10	-0.7063*	-1.73
(1, 10)	-0.8973	-1.63	-0.1893	-0.21	-1.4651**	-2.11
(1, 15)	-0.7954	-1.11	0.3618	0.30	-1.7234**	-2.01
(1, 20)	-0.7139	-0.91	0.6161	0.48	-1.7804*	-1.84
(1, 30)	-0.5999	-0.63	1.0969	0.78	-1.9607	-1.50
N	182		81		101	

**Table 5. The effect of media coverage on abnormal return**

This table presents cross-sectional regression results. The dependent variable is CAR (-1, 1) for the high social awareness period and estimated as described in section 4.1. Polarity ranges from [-1, +1], where -1 indicates negative news with the strongest confidence and +1 indicates positive news with the strongest confidence. We change the sign of the value of Polarity to present clear implications. Surprise is defined as (1- probability of media coverage for CSiR news). We calculate the possibilities of media coverage for CSiR news by using the logit model. Top3 is a dummy variable that is equal to 1 if a news article is reported by one of the top three news media. CSR is a dummy variable that is equal to 1 if a firm was listed in the top 200 companies of the KEJI index. Intensity indicates the number of related news articles on the event day. Size is the natural log of market value of equity on the CSiR event day. Book-to-market is the ratio of book value of common equity at fiscal year-end immediately preceding the CSiR event to market value of equity on the event day. Momentum is the cumulative excess returns over the past one month (21 trading days) before the CSiR event day (in percentage). We also include year fixed effects. The t-statistics (in parentheses) are based on robust standard errors. \*, \*\*, and \*\*\* denote significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>Variables</b>						
Polarity	-1.985** (-2.27)	-1.685** (-2.01)				
Surprise			-21.60** (-2.61)	-20.60** (-2.63)		
Top3					-1.654* (-1.78)	-1.452* (-1.70)
CSR		0.135 (0.14)		0.675 (0.67)		0.344 (0.33)
Intensity		-0.251* (-1.99)		-0.234 (-1.58)		-0.217* (-1.79)
Size		0.632* (1.73)				0.690* (1.86)
Book-to-market		0.472 (1.16)				0.506 (1.35)
Momentum		-0.0449 (-1.19)		-0.0381 (-1.03)		-0.0446 (-1.33)
_cons	0.509 (0.89)	-10.25* (-1.69)	19.45** (2.56)	17.30** (2.46)	-0.132 (-0.27)	-11.55* (-1.92)
N	100	100	98	98	100	100
adj. R-sq	0.020	0.075	0.042	0.059	0.021	0.076
Year FE	No	Yes	No	Yes	No	Yes

**Table 6. The interaction effect of CSiR and CSR on firm value**

This table presents panel regression results. The dependent variable is the natural log of Tobin's Q, winsorized at 1% and 99%. CSiR is a dummy variable that is equal to 1 if the firm had at least one CSiR events in a given year. CSR is a dummy variable that is equal to 1 if a firm was listed among the top 200 companies of the Korea Economic Justice Institute (KEJI) index. Social indicates the ratings of social component of ESG ratings published by KCGS. Size is the natural log of market value of equity at year-end. ROA is the ratio of operating income divided by the total assets at fiscal year-end. Age is the natural log of the number of years since the company was established. R&D is the ratio of the firm's R&D expense to total assets. Leverage is the ratio of a firm's long-term debt to total assets. We also include industry and year fixed effects. The t-statistics (in parentheses) are based on robust standard errors. \*, \*\*, and \*\*\* denote significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)	(4)	(5)
CSR measure		CSR		CSRS	Social
<b>Variables</b>					
CSiR×CSR			0.598**	0.145**	0.372*
			(2.57)	(2.15)	(1.72)
CSiR	-0.191*	-0.192*	-0.330***	-9.323**	-0.195
	(-1.76)	(-1.76)	(-2.70)	(-2.10)	(-0.75)
CSR		-0.0266	-0.0457	0.00461	-0.0190
		(-0.63)	(-1.07)	(0.25)	(-0.22)
Size	0.0210*	0.0207*	0.0206*	0.0195	0.0579**
	(1.88)	(1.85)	(1.84)	(0.88)	(2.05)
ROA	0.00586	0.00622	0.00631	0.0314***	0.0285***
	(1.08)	(1.11)	(1.13)	(3.32)	(2.99)
Age	-0.0906***	-0.0900***	-0.0835***	-0.0165	-0.0350
	(-3.41)	(-3.37)	(-3.14)	(-0.32)	(-0.66)
R&D	7.146***	7.174***	7.199***	5.642**	5.143**
	(8.19)	(8.15)	(8.14)	(2.37)	(2.14)
Leverage	0.0224***	0.0225***	0.0220***	0.0154	0.0150
	(2.96)	(2.98)	(2.95)	(1.52)	(1.50)
Environmental					-0.182**
					(-2.24)
Governance					0.0771
					(0.90)
_cons	-0.426**	-0.425**	-0.445***	-1.034	-1.118***
	(-2.49)	(-2.48)	(-2.60)	(-0.84)	(-2.84)
N	1837	1837	1837	485	485
adj. R-sq	0.259	0.259	0.261	0.232	0.236
Industry FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes

**Table 7. Robustness test: CARs on CSiR news**

This table presents cumulative abnormal returns (CAR, in percentage) around the CSiR events. Panel A presents event study results with alternative asset pricing model: the CAPM model, the Fama-French (1993) three-factor model, and the Carhart (1997) four-factor model. Panel B, C, and D show event study results controlling for Fine type, repetition of similar events, and industry, respectively. We calculate CARs during the entire sample period (from 2008 to 2017) and categorize the sample period into two sub-sample periods: a low social awareness period (from 2008 to 2012) and a high social awareness period (from 2013 to 2017). For the estimation window, we use daily returns over the period (-250 to -21) where the event day is defined as the first news report day. The event study methodology is provided in Appendix C. \*, \*\*, and \*\*\* denote significance at the 10%, 5% and 1% levels, respectively.

		Entire sample (2008-2017)		Low social awareness (2008-2012)		High social awareness (2013-2017)	
		CAR	t-value	CAR	t-value	CAR	t-value
<b>Panel A. Alternative asset pricing model</b>							
CAPM	(-1, 1)	-0.8398**	-2.33	-0.7337	-1.29	-0.9248*	-1.98
	(-5, 5)	-1.5131**	-2.60	-1.3671	-1.37	-1.6301**	-2.39
	N	182		81		101	
FF3	(-1, 1)	-0.8744**	-2.26	-0.7044	-1.23	-1.0191*	-1.94
	(-5, 5)	-1.2613**	-2.20	-0.9741	-0.99	-1.5109**	-2.31
	N	174		80		94	
C4F	(-1, 1)	-0.7682**	-2.02	-0.6196	-1.09	-0.8946*	-1.74
	(-5, 5)	-1.1087*	-1.97	-0.8587	-0.90	-1.3260**	-2.04
	N	174		80		94	
<b>Panel B. Controlling for Fine type</b>							
Non-fine	(-1, 1)	-0.6287	-1.61	-0.5624	-0.76	-0.6792*	-1.67
	(-5, 5)	-1.5461**	-2.31	-1.4804	-1.23	-1.5960**	-2.13
	N	132		57		75	
<b>Panel C. Controlling for repetition of similar events</b>							
Non-repeat	(-1, 1)	-1.0407**	-2.41	-0.9108	-1.32	-1.1346**	-2.04
	(-5, 5)	-2.2175***	-3.36	-2.6984**	-2.40	-1.8699**	-2.34
	N	143		60		83	
<b>Panel D. Controlling for industry</b>							
Non-B2C	(-1, 1)	-0.8860***	-2.78	-0.7429	-1.38	-1.0023**	-2.63
	(-5, 5)	-1.2452*	-1.80	-0.8379	-0.71	-1.5765*	-1.93
	N	136		61		75	

**Table 8. Robustness test: the effect of alternative media coverage variables on abnormal return**

This table presents cross-sectional regression results. The dependent variable is CAR (-1, 1) for the high social awareness period and estimated as described in section 4.1. Polarity ranges from [-1, +1], where -1 indicates negative news with the strongest confidence and +1 indicates positive news with the strongest confidence. We change the sign of the value of Polarity to present clear implications. Surprise is defined as (1- probability of media coverage for CSiR news). We calculate the possibilities of media coverage for CSiR news using the logit model. Top3 is a dummy variable that is equal to 1 if a news article is reported by one of the top three news media. CSR is a dummy variable that is equal to 1 if a firm was listed among the top 200 companies of the KEJI index. Intensity indicates the number of related news articles on the event day. Exposure is the number of news article from the major news outlets for each firm within a year. Book-to-market is the ratio of book value of common equity at fiscal year-end immediately preceding the CSiR event to market value of equity on the event day. Momentum is the cumulative excess returns over the past one month (21 trading days) before the CSiR event day (in percentage). We also include year fixed effects. The t-statistics (in parentheses) are based on robust standard errors. \*, \*\*, and \*\*\* denote significance at the 10%, 5% and 1% levels, respectively.

	(1)	(2)	(3)
<b>Variables</b>			
Polarity	-1.475* (-1.68)		
Surprise		-11.57* (-1.70)	
Top3			-1.424* (-1.73)
CSR	0.490 (0.52)	0.599 (0.61)	0.698 (0.69)
Intensity	-0.249** (-2.15)	-0.240* (-1.73)	-0.217** (-2.02)
Exposure	0.751** (2.18)	0.562 (1.52)	0.832** (2.39)
Book-to-market	0.382 (0.91)		0.407 (1.07)
Momentum	-0.0534 (-1.40)	-0.0495 (-1.39)	-0.0547 (-1.61)
_cons	-6.152* (-1.92)	5.081 (0.64)	-6.989** (-2.36)
N	100	98	100
adj. R-sq	0.079	0.075	0.085
Year FE	Yes	Yes	Yes