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THE ROLE OF A FIRM'S NEGATIVE MEDIA COVERAGE OF CORPORATE SOCIAL RESPONSIBILITY PRACTICES IN PREDICTING THE SUPPLY OF CASH FLOW FORECASTS

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ABSTRACT

Analysts seek to provide investors with an accurate picture of firm value using tangible and intangible criteria. Researchers use one intangible measure, corporate social responsibility (CSR), to proxy for the firm's relationship with its stakeholders. The purpose of this paper is to advance research in two ways. First, we examine cash flow forecasts because they are less subjective than earnings forecasts. Second, we focus on a firm's corporate social irresponsibility (CSIR) reputation formed through negative media coverage of environmental, social, and governance practices. Our paper posits that analysts are less likely to provide cash flow forecasts for a firm with a poor CSIR reputation. We conducted a study with 50,365 firm-year observations over twelve years. We support our hypothesis after controlling for endogeneity: The likelihood of analyst cash flow forecast issuance is associated negatively with firm negative media coverage. Additional analyses show that numerous firm and industry-related variables moderate this effect. This decrease in cash flow forecast issuance likelihood occurs, even if the poor CSIR reputation is from as long ago as three years prior or is due to environmental, social, or governance issues. Furthermore, increases in cash flow volatility and capital intensity positively moderate the likelihood of issuing a cash flow forecast, while increases in ROA and Tobin's q negatively moderate the likelihood of issuing a cash flow.

INTRODUCTION

One of the main goals of financial analysts is to determine the value of a firm. To this end, analysts historically have provided *earnings* forecasts. However, earnings are subjective and susceptible to managerial manipulation (Edmonds et al., 2011; Levitt, 2002). Thus, some analysts forecast *cash flows* when assessing the financial values of companies to understand the impact of current earnings on future cash flows (e.g., Hashim & Strong, 2018; Pae & Yoon, 2012). The supply of cash flow forecasts and the weight that CEOs place on cash flows indicate the importance of their role (DeFond & Hung, 2003; Givoly et al., 2009; Graham et al., 2005). To reach these valuations, analysts appraise intangible information to reduce the information asymmetry gap (Orens & Lybaert, 2007; Simpson, 2010). Corporate social responsibility (CSR) is a common source of intangible information that is especially pertinent to analysts because it captures the firm's interactions with numerous stakeholder groups (e.g., employees and community) (Freeman et al., 2004; Russo & Fouts, 1997). Studies show that analysts are more willing to follow firms that actively engage in CSR activities, which provide additional information that can improve a firm's reputation (Hawn & Ioannou, 2016; Luo et al., 2015).

However, less is known about the effects of a firm's reputation generated by corporate social *irresponsibility* (CSIR) (Asante-Appiah, 2020; Burke et al., 2019; Jeriji & Louhichi, 2021), specifically, whether a firm's CSIR reputation affects the likelihood that analysts will issue cash flow forecasts. The answers to this question are important for several reasons. First, firm value is based on the present value of expected future cash flows (Barth et al., 2016). Investors perceive information regarding cash flows as being more concrete and less susceptible to artificial manipulations than "Pro-forma" or actual reported earnings (Edmonds et al., 2011) and help assess firm value (Ali, 1994; Rayburn, 1986). Second, due to

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its higher level of diagnosticity and salience, CSIR is more relevant to investors than CSR (e.g., Dhaliwal et al., 2014; Lev et al., 2010). CSIR's reputation affects the degree to which stakeholders view the firm as a good or bad actor (Lin-Hi & Blumberg, 2018). A poor CSIR reputation indicates concerns with a firm's long-term viability (Bozzolan et al., 2015), signaling issues with future earnings and firm value (Kölbel et al., 2017). The negative information conveyed by a poorer CSIR reputation may cause analysts to be concerned about the firm's riskiness and, thus, their ability to forecast a firm's cash flow (Gloßner, 2017). In other words, reducing information asymmetry around CSIR can unveil greater information asymmetry around other aspects of the firm.

Finally, our research utilizes a CSIR dataset based on the media reporting of CSIR issues to measure CSIR reputation (Burke et al., 2019) rather than self-reporting CSR activities used in prior related research (e.g., Hsu et al., 2019). The media play a strong role in forming a firm's reputation (e.g., Soroka et al., 2018). For instance, in 2021, Amazon and Starbucks drew attention for their anti-union stances (Scheiber, 2022), and in 2020, Wells Fargo paid $3 billion to settle its fake account scandal (Kelly, 2020).

In sum, our paper contributes to the nexus of two important topics: cash flows and CSIR reputation, by focusing on the reputational effect of CSIR on cash flow forecast issuance likelihood (e.g., DeFond & Hung, 2003). The results of our investigation extend the small body of research on CSIR and accounting topics (e.g., Asante-Appiah, 2020; Burke et al., 2019) by revealing how analysts behave as a firm's CSIR reputation worsens. We tested our hypotheses using a longitudinal dataset of 50,365 firm-year observations from RepRisk AG with a model that controls for endogeneity. Our main investigation approaches cash flow forecasts from the supply side and finds that analysts are less likely to issue cash flow forecasts when a firm has a worse CSIR reputation. Additional analyses presented in the methods and supplementary information section reveal three additional findings. First, we find that firm and industry-related variables either positively or negatively moderate the effect of CSIR's reputation. These results indicate that the effect of CSIR's reputation is contingent. Second, results suggest that the disaggregated dimensions of CSIR reputation (i.e., environmental, social, and governance) produce the same negative relationship with analysts' decisions to issue cash flow forecasts. Finally, we show that CSIR's reputation is stable over time, such that prior CSIR reputation is associated with a lower likelihood of issuing cash flow forecasts. Our study also has policy implications by providing insight into how analysts approach CSIR (e.g., Dhaliwal et al., 2011; Luo et al., 2015). Our results indicate that analysts are warier in issuing cash flow forecasts when a firm's CSIR reputation is more negative.

The remainder of this paper is organized as follows. First, we present a review of CSIR and cash flow forecast literature. The materials and methods section describes the hypotheses, data, sample selection process, and research methods. The results section discusses the empirical results and provides additional sensitivity analysis. The discussion section assesses the findings and discusses the implications and limitations of the study. Finally, the paper concludes with a conclusions section.

LITERATURE REVIEW

CSIR and Corporate Reputation

CSIR conveys corporate illegitimacy, the "set of corporate actions that negatively affect an identifiable social stakeholder's legitimate claims" (Strike et al., 2006, p. 852). CSIR signals problems with stakeholders that can negatively affect a firm's reputation (Kölbel et al., 2017), decrease positive media coverage (Zavyalova et al., 2012), and reduce firm legitimacy (Doh et al., 2010). For example, firms with greater levels of CSIR have lower earnings persistence (Hsu et al., 2019) which exacerbates risk (Burke et al., 2019; Oikonomou et al., 2014). Moreover, stock markets react negatively to news of CSIR (Gloßner, 2017).

However, some arguments suggest that analysts take a more nuanced view of CSIR by examining the effect of CSIR actions on firm attributes and reputation (Lange & Washburn, 2012). In other words, the perception of the firm stemming from its CSIR drives stakeholder response (Fombrun & Shanley, 1990). The stakeholders base their conclusions on explanatory inquiry and determine whether the firm deserves sanction (Hamilton, 1980). As evidence, Nardella et al. (2020) find that penalty for CSIR is firm and circumstance-dependent. In sum, it is more important to view the reputational effects of CSIR activities rather than the specific actions themselves. Our dataset is based on the reputational view rather than firm disclosure and third-party reporting of firm activities.

News media caters to the basic human preference for captivating (negative) information compared with less interesting (positive) information (e.g., Soroka, 2006). While the media may not follow every CSIR story with equal effort, media coverage is critical in contributing to a firm's CSIR reputation (Kölbel et al., 2017), and the media have a greater focus on negative events (Soroka et al., 2018). Moreover, prior research has found that media coverage is a source of information that affects auditors' opinions (Burke et al., 2019). Media coverage may provide a context that can frame information (Fombrun & Shanley, 1990), change public discourse and perception (Deephouse, 2000), and affect firm strategies (Bednar et al., 2013). A poor CSIR reputation may lead to institutional pressure for a firm to change, or risk threats of sanctions, undermining its legitimacy (Delmas & Toffel, 2004).

Cash Flow Forecasts

Investors and the news media pay attention to earnings forecasts. However, accrual-based earnings are subject to estimation errors that make accurate forecasting of earnings difficult for analysts (see Dechow & Dichev, 2002). Earnings also are prone to management manipulation because they are based on managerial estimates, which create an incentive to manipulate earnings since executive compensation is often based on earnings rather than cash flows (e.g., Edmonds et al., 2011). Cash

flows, on the other hand, are less subjective than accrual-based earnings (Levitt, 2002). Cash flows refer to the net amount of cash and cash equivalents that a business receives and distributes during a set time (FASB, 1987). Thus, cash flow forecasts are higher than earnings forecasts (Park & Stice, 2000).

Analysts also provide cash flow forecasts along with earnings forecasts because cash flow information is useful in helping investors to interpret earnings (DeFond & Hung, 2003; Pae & Yoon, 2012). There is plenty of evidence that market participants use the information provided by analysts through their earnings forecasts, recommendations, and reports to influence stock prices (e.g., Abarbanell & Leavy, 2003; Asquith et al., 2005; Beaver et al., 2008; Francis & Soffer, 1997). Researchers argue that cash flow is a better metric than earnings for assessing the liquidity and solvency of a firm (Graham et al., 2005) because it serves as an additional monitoring mechanism for firms of poor earnings quality (Edmonds et al., 2011). Earnings forecasts are more accurate when accompanied by cash flow forecasts (Hashim & Strong, 2018). This suggests that analysts adopt a more structured and disciplined approach to forecasting earnings while issuing cash flow estimates. In sum, cash flow forecasts provide value to investors in their investment decision-making process (Call et al., 2013). DeFond and Hung (2007) found empirical evidence consistent with the notion that analysts are providing more cash flow forecasts in response to demand by investors who raise concerns about the reliability of earnings which are subject to manipulation by managers.

MATERIALS AND METHODS

Hypothesis Development

Analysts only issue cash flow forecasts for some firms (e.g., Yoo & Pae, 2017). One theme underlying the issuance of cash flow forecasts is the added benefit they provide beyond earnings forecasts (Call et al., 2013), especially for firms with underlying concerns (DeFond & Hung, 2003). Analysts can create a more accurate picture of the firm's valuation through cash flow forecasts when they have access to additional and better information (Hashim & Strong, 2018). However, we approach the effect of negative media CSIR coverage on analyst likelihood to issue cash flow forecasts from the supply side. Analysts are less likely to issue cash flow forecasts for firms with worse CSIR reputations for two main reasons.

First, a worse CSIR reputation is a sign of increased firm uncertainty because it implies concerns similar to underlying financial issues (DeFond & Hung, 2003). For instance, poor CSIR reputation, as measured by media coverage, increases the firm risk (Kölbel et al., 2017), and CSIR activities are related to decreased firm credit ratings (Jiraporn et al., 2014) and increased volatility (Mishra & Modi, 2013). Investors find the potential for losses caused by CSIR issues (Shen & Chih, 2005) makes it difficult to value firms (Lee et al., 2018). Herremans et al. (1993) and Mishra and Modi (2013) imply that negative CSR disclosures increase idiosyncratic return volatility. Firms with media coverage of CSIR issues are more likely to engage in unethical financial reporting, aggressive earnings manipulation, and ethical concerns regarding management (Kim et al., 2012). Burke et al. (2019) find that auditors are more likely to resign and increase audit fees in response to the riskiness of firms with high levels of media coverage of CSIR. The negative impact of CSIR issues surrounding a firm could be associated with business risks, including product, supply chain, or operational risks, and thus negatively associated with the firm's future financial performance (Jenkins, 2001). Stakeholders may utilize boycotts, lawsuits, and other protests in response to CSIR behavior (Baron & Diermeier, 2007; Doh & Guay, 2006; Eesley & Lenox, 2006).

Second, while news of a firm's CSIR may reduce information asymmetry regarding the CSIR, it may signal greater levels of asymmetry regarding other aspects of the firm. The effect of CSIR coverage can also increase information asymmetry because CSI activities increase differences in the opinions of various stakeholders and further obscure the information environment (Cui et al., 2018). Prior literature suggests that firms with poor CSR practices and/or high levels of CSIR are characterized by worse reputation, high information asymmetry, high risk, and providing lower quality disclosures (Becchetti et al., 2013; Bhandari & Kohlbeck, 2018), and managers of these type of firms may tend to provide more ambiguous disclosures to hide information that is substantially sensitive to investors strategically (e.g., Diamond & Verrecchia, 1991; Lambert et al., 2007).

In sum, firms with poor CSIR reputations should have a lower likelihood of analysts' issuing a cash flow forecast because there may likely be additional underlying concerns that present increased overall levels of information asymmetry. Thus, analysts may be reluctant to issue cash flow forecasts because there is a greater chance that their forecasts may need to be more accurate. Stated formally:

H1. The likelihood of analyst cash flow forecast issuance is negatively associated with negative media coverage of the firm CSIR.

CSIR Reputation Score Measurement

RepRisk AG is a global research and business intelligence provider of CSIR risks. The database has been used by 100 global financial and corporate clients for risk management, compliance, and supply chain oversight, as well as supervision of reputation, peers, non-governmental organizations (NGOs), and CSIR issues (Burke et al., 2019). RepRisk uses a proprietary algorithm to calculate an index based on the severity of the issues, the reach of media sources, and the frequency and timing of information. RepRisk gathers data by systematically screening a wide range of media in fifteen languages (e.g., newspapers, social media, NGOs, and governmental agencies). Since reputation is often not based on fact, RepRisk does not consider the accuracy of allegations and accusations, only what media, and external stakeholders report (Kölbel et al., 2017). RepRisk categorizes these risks into five CSIR issue categories (Appendix A): environmental footprint, community

relations, employee relations, corporate governance, and general issues (Kölbel et al., 2017). RepRisk creates the issue categories under international standards and norms (e.g., the UN Global Compact's Ten Principles and the Universal Declaration of Human Rights) (Kölbel et al., 2017).

The basic dataset covers approximately 11,000 monthly CSIR reputation company observations (CSIR_REP) from a variety of industry sectors and countries. The CSIR_REP scores range from -1 to 100. A score of -1 indicates that the firm has never had a CSIR_REP score above 0. A score of 0 indicates that the current score is 0 but was once above 0. A higher CSIR_REP score indicates a worse CSIR reputation (Appendix B).

Data Sources
The dataset consisted of 50,365 firm-year observations compiled from RepRisk and words (Burke et al., 2019). The model included numerous control variables and used 2SLS regression to address endogeneity concerns. We gathered data from Audit Analytics, Compustat, CRSP, Execucomp, I/B/E/S, Institutional Shareholder Services, and RepRisk to create the dataset used in this study. After we combined the datasets, there were 50,365 firm-quarter complete observations to test the likelihood of issuing a cash flow forecast (H_1) (Appendix D; Table D1).

Endogeneity
To correct for the potential bias due to endogeneity in CSIR_REP, the modeling approach employed 2SLS regression (e.g., Kini & Williams, 2012). Specifically, the first stage estimated the predicted value of the endogenous CSIR_REP with instrumental variables. Prior research suggested that the level of CSR may vary across industries due to the nature of the products, regulatory environment, or shifts in social norms (McWilliams & Siegel, 2001). Thus, in the first stage, we estimated firm-level CSIR reputation scores for each year using industry-mean reputation score variables (i.e., *CSIR_REP_AVG*, *PEAK_CSIR_REP_AVG*, and *CSIR_REP_CHG_AVG*) based on 48 industry classifications as an instrument (Cui et al., 2018). We used fixed effects and instrumented the original *CSIR_REP* variable with industry-mean reputation score variables (Cui et al., 2018). The predicted values of *CSIR_REP* represent the independent variables in the second-stage regression models.

We performed several tests for weak instrumentation. First, the coefficient of each instrument is statistically significant in the first-stage regressions, indicating that the instruments are relevant (Appendix D; Table D2). Second, the adjusted R^2 value is relatively high (67.88), indicating a lack of a weak instrument problem. The F statistic (1624.82) is above 10, indicating a valid instrument that is statistically significant, supporting the idea that the instruments are jointly relevant in the first stage and less likely to suffer from the weak instrument problem. Third, the Stock-Yogo relative bias test indicated that there was not a weak instrument problem in the first-stage regression model (the minimum eigenvalue statistic is higher than the 15% rejection level critical value) (Stock & Yogo, 2005). Fourth, we ran the Montiel-Pflueger test for weak instrumentation, which addresses weak instrumental variable testing even for data where errors are not conditionally homoscedastic and serially uncorrelated (Montiel Olea & Pflueger, 2013). The test indicated that the instrumentation is not weak (Pflueger & Wang, 2015).

Dependent Variable: Cash Flow Forecast Issuance Likelihood (CFF_LIKELIHOOD)
We operationalized cash flow forecast issuance likelihood to (*CFF_LIKELIHOOD*) as an indicator variable, with a value of one if analysts issued at least one cash flow forecast during the fiscal quarter, and zero otherwise (DeFond & Hung, 2003).

Control Variables
We control for several factors affecting analysts' likelihood to issue cash flow forecasts. Detailed definitions of these variables are in Appendix C. The first group of factors captures firm characteristics that indicate greater investors' need for cash flow forecasts (DeFond & Hung, 2003). High earnings volatility (*CFO_VOL*) increases analysts' difficulty forecasting cash flows. Thus, analysts may decrease their propensity to issue cash flow forecasts. Accruals (*ABS_ACCRUAL*) are subject to management manipulation and may distort liquidity constraints, providing a need for cash flow forecasts to validate earnings (Wild et al., 2007). The heterogeneity of accounting methods (*HETERO_METHOD*) captures the comparability of a firm's accounting choice with its industry peers (DeFond & Hung, 2003). The index has a value of one when a firm's accounting choice differs from the most frequently used method in that firm's industry group. Capital intensity (*CAP_INT*) is gross property, plant, and equipment divided by average assets. Investors may rely more on cash flow forecasts to assess a firm's ability to fulfill its financial obligations when financial health is low, measured by the Altman Z-score (*ALTMAN_Z*) (Altman, 1968).

Second, we controlled for the richness of the information environment because it could decrease the cost for analysts to generate cash flow forecasts, increasing their likelihood. On the other hand, a richer information environment also may decrease investors' demand for cash flow forecasts if they can augment the forecast with other information sources (Bilinski, 2014). We control for a firm's information environment with the natural logarithm of one plus the equity market capitalization (*SIZE*) and the number of analysts following a company (*ANALYST_FOLLOWING*).

Third, we controlled for the book-to-market (*BM*) ratio as cash flow forecasts may be more valuable in assessing the earnings quality of high-growth firms (Bilinski, 2014). Fourth, analysts may be less likely to issue cash flow forecasts for younger firms because these firms need more financial information than older firms (Bilinski, 2014). Fifth, analyst cash flow forecasts may help assess the performance of companies that generate losses (*DLOSS*) (Collins et al., 1997). Sixth, the

model includes a dummy variable for periods of the financial crisis (2007-2009), when cash flow forecasts may be more valuable to investors in assessing firm performance (*FIN_CRISIS*) (Bilinski, 2014). Seventh, we control for the degree of liquidity (*OCF*). Eighth, researchers have found that CSIR effects may be curvilinear; thus, we include a squared term of *CSIR_REP*. Finally, the model includes industry dummies based on 2-digit I/B/E/S SIC codes (*INDUSTRY_DUMMIES*) and year dummies for the EPS forecast issue year (*YEAR_DUMMIES*). To remove potential outliers, all continuous variables are winsorized at the 1st percentile and 99th percentiles.

Cash Flow Forecast Issuance Likelihood Model

Equation 1 describes our final model to test H1.

$$P(CFF\_LIKELIHOOD)_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 ANALYST\_FOLLOWING_{it} + \alpha_3 BM_{it} + \alpha_4 AGE_{it} + \alpha_5 DLOSS_{it} + \alpha_6 FINCRISIS_{it} + \alpha_7 CFO\_VOL_{it} + \alpha_8 CAPINT_{it} + \alpha_9 ABSACCRUAL_{it} + \alpha_{10} ALTMAN\_Z_{it} + \alpha_{11} HETERO\_METHOD_{it} + \alpha_{12} CFO_{it} + \alpha_{13} CSIR\_REP_{it} + \alpha_{14} CSIR\_REP^2_{it} + \alpha_{15-24} YEAR\_DUMMIES + \alpha_{25-83} INDUSTRY\_DUMMIES + \varepsilon_{it}$$

(1)

RESULTS

Descriptive Statistics

Table 1 presents the descriptive statistics for the cash flow likelihood model variables. For instance, a firm's propensity to issue a cash flow forecast (CFF_LIKELIHOOD) is 61%. The mean and median for the standard deviation of operating cash flow (cash flow volatility) are 0.039 and 0.026. Capital intensity accounts for an average of 16% of firm assets, suggesting that firms in the dataset are capital-intensive. The mean and median for Altman's Z-score are 2.631 and 1.715. The minimum CSiR_REP value is -1, and the maximum value reaches 81; 37.26% have a score of -1, 9.91% have a score of 0, and 52.83% have a score greater than zero. Table 2 presents the correlations of the variables used in the likelihood of issuing a cash flow forecast model.

Table 1. Descriptive statistics of variables used in the likelihood to issue a cash flow forecast main model (H$_1$) and additional analyses, models

Variable	N	Mean	Median	Std Dev	Minimum	Maximum	25th Pct	50th Pct	75th Pct
CFF_LIKELIHOOD	50,365	0.610	1.000	0.488	0.000	1.000	0.000	1.000	1.000
CURRENT_RRI	50,365	8.886	0.000	12.969	-1.000	81.000	-1.000	0.000	19.000
PEAK_RRI	50,365	16.116	18.000	17.728	-1.000	83.000	-1.000	18.000	31.000
RRI_TREND	50,365	8.757	0.000	12.891	-1.000	74.000	-1.000	0.000	19.000
HETERO_METHOD	50,365	0.264	0.250	0.175	0.000	2.250	0.250	0.250	0.333
CFO_VOL	50,365	0.039	0.026	0.047	0.000	6.562	0.011	0.026	0.054
CFO	50,365	0.036	0.022	0.079	-9.047	1.648	0.007	0.022	0.058
ABS_ACCRUALS	50,365	0.013	0.005	0.030	0.000	6.277	0.002	0.005	0.014
CAP_INT	50,365	0.160	0.072	0.277	0.000	9.395	0.022	0.072	0.155
ALTMAN_Z	50,365	2.631	1.715	5.218	-120.272	775.112	0.665	1.715	2.860
SIZE	50,365	8.343	8.636	1.680	0.167	13.483	7.147	8.636	9.484
ANALYST_FOLLOWING	50,365	0.941	0.693	0.989	0.000	3.526	0.000	0.693	1.609
BM	50,365	0.667	0.540	1.022	-372.407	69.247	0.303	0.540	0.924
AGE	50,365	22.562	21.000	11.157	1.000	113.000	16.000	21.000	27.000
DLOSS	50,365	0.135	0.000	0.341	0.000	1.000	0.000	0.000	0.000
FIN_CRISIS	50,365	0.090	0.000	0.287	0.000	1.000	0.000	0.000	0.000
HIGH_LITIGATION_RISK	50,365	0.007	0.000	0.081	0.000	1.000	0.000	0.000	0.000
HI	50,365	0.006	0.004	0.014	0.004	0.296	0.004	0.004	0.004
INSTITUTIONAL_OWNERSHIP	50,365	0.786	0.856	0.251	0.000	3.023	0.644	0.856	0.966
ROA	50,365	0.002	0.009	0.303	-139.470	0.575	0.004	0.009	0.014
SIZE	50,365	6.354	6.746	1.596	-6.215	11.787	5.249	6.746	7.321
TOBIN'S_Q	50,365	1.662	1.231	1.188	0.196	81.231	1.015	1.231	1.774
FIRM_RISK	50,365	0.021	0.016	0.017	0.001	0.279	0.012	0.016	0.024
HIGH_VOLATILITY	50,365	0.232	0.000	0.422	0.000	1.000	0.000	0.000	0.000

Variables definitions are in Appendix C.

Table 2. Correlation table of variables used in the likelihood to issue a cash flow forecast main model (H_1) and additional analyses models

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1) CFF_LIKELIHOOD	1.00																					
2) PEAK_CSIR_REP	0.12	1.00																				
3) CSIR_REP_CHG	0.17	0.85	1.00																			
4) CSIR_REP	0.37	0.01	0.07	1.00																		
5) HETERO_METH.	0.10	0.27	0.18	0.06	1.00																	
6) CFO_VOL	-0.05	-0.10	-0.08	-0.21	0.06	1.00																
7) OCF	0.13	0.08	0.07	0.09	0.15	-0.01	1.00															
8) ABS_ACCRUALS	-0.05	-0.07	-0.07	-0.14	0.05	0.47	0.01	1.00														
9) CAP_INT	-0.06	-0.02	-0.07	-0.12	0.16	0.00	0.08	0.07	1.00													
10) ALTMAN_Z	-0.01	0.03	0.05	0.07	0.10	0.08	0.27	-0.03	-0.07	1.00												
11) SIZE	0.41	0.47	0.48	0.82	0.24	-0.19	0.16	-0.12	-0.18	0.11	1.00											
12) ANALYST_FOLL.	-0.72	0.02	0.00	-0.03	-0.02	-0.04	-0.06	-0.03	0.11	0.09	-0.02	1.00										
13) BM	-0.17	0.02	0.00	-0.25	-0.15	-0.12	-0.13	-0.09	-0.07	-0.14	-0.17	0.11	1.00									
14) AGE	-0.03	0.24	0.18	0.25	-0.04	-0.18	-0.06	-0.13	0.25	-0.07	0.18	0.02	0.06	1.00								
15) GLOSS	-0.12	-0.06	-0.07	-0.23	-0.04	0.08	-0.17	0.23	0.10	-0.10	-0.24	0.05	0.12	-0.12	1.00							
16) FIN_CRISIS	-0.06	-0.22	-0.16	0.00	-0.05	0.06	-0.01	0.10	-0.02	0.01	-0.11	0.00	0.04	-0.18	0.13	1.00						
17) HIGH_LITIGAT_RISK	0.00	0.01	0.02	-0.04	0.01	0.03	-0.01	0.02	0.26	0.00	-0.01	0.02	0.00	-0.11	0.03	-0.01	1.00					
18) HHI	0.00	-0.04	-0.05	-0.16	-0.18	0.37	-0.17	0.17	-0.03	0.02	-0.16	-0.01	0.08	-0.12	0.07	-0.02	0.08	1.00				
19) INST_OWNERSHIP	0.30	-0.02	-0.03	0.43	0.15	-0.25	0.15	-0.18	-0.12	-0.05	0.37	0.04	-0.19	0.16	-0.15	-0.04	-0.05	-0.33	1.00			
20) ROA	0.04	0.02	0.02	0.10	0.04	-0.02	0.04	-0.11	-0.05	0.06	0.10	0.01	-0.03	0.02	-0.13	-0.04	0.00	0.01	0.08	1.00		

21) TOBIN'S_Q	0.19	0.05	0.07	0.23	0.18	0.34	0.40	0.32	-0.01	0.63	0.30	-0.11	-0.40	-0.20	-0.07	0.01	-0.01	-0.08	0.06	0.01	1.00
22) FIRM_RISK	-0.16	-0.25	-0.21	-0.21	-0.11	0.10	-0.03	0.14	0.08	-0.06	-0.33	0.01	0.35	-0.25	0.27	0.49	0.02	-0.02	-0.19	-0.15	-0.07	1.00
23) HIGH_VOLATILITY	-0.17	-0.40	-0.32	0.00	-0.10	0.12	0.05	0.12	-0.01	0.08	-0.22	0.08	0.06	-0.47	0.12	0.57	-0.02	-0.03	-0.09	-0.02	0.05	0.46

|corr| > .005 are significant at p <.05; N = 50,365
Variable definitions are in Appendix C.

Table 3. A firm's CSIR reputation affects an analyst's cash flow forecast issuance likelihood (CFF_LIKELIHOOD) (H$_1$).

Variables	Model 1: Control Variables		Model 2: Main Effects	
	Coeff.	S.E.	Coeff.	S.E.
Intercept	0.379 ***	0.064	0.278 ***	0.062
SIZE	0.108 ***	0.002	0.120 ***	0.002
ANALYST_FOLLOWING	-0.335 ***	0.001	-0.339 ***	0.001
BM	0.005	0.004	0.003	0.003
AGE	-0.003 ***	0.001	-0.002 ***	0.000
GLOSS	-0.025 ***	0.005	-0.021 ***	0.005
FIN_CRISIS	-0.154 ***	0.011	-0.122 ***	0.011
CFO_VOL	0.178	0.128	0.196	0.135
CAP_INT	0.049 ***	0.007	0.060 ***	0.007
ABS_ACCRUALS	-0.170 ***	0.049	-0.179 ***	0.045
ALTMAN_Z	-0.003	0.004	-0.001 *	0.000
OFF	0.167 ***	0.032	0.100 ***	0.026
HETERO_METHOD	0.055 ***	0.009	0.053 ***	0.008
CSIR_REP	***		-0.011 ***	0.001
CSIR_REP^2	***		-0.005 ***	0.001
Year FE	Yes		Yes	
Industry FE	Yes		Yes	
No. of obs.	50,365		50,365	
Adjusted R^2	79.96%		80.77%	

Variables definitions are in Appendix C. Robust standard errors are corrected for firm-level clustering and heteroskedasticity. *, **, *** denote significance at 10%, 5%, and 1% levels, respectively. Increase in CSIR_REP=worse CSIR reputation. Lower CFF_LIKELIHOOD=less likely to issue a forecast.

Cash Flow Issuance Likelihood

Table 3 presents the results of the impact of a firm's CSIR reputation on an analyst's likelihood to issue a cash flow forecast for the firm (H1). Model 1 contains the control variables only. The propensity to issue a cash flow forecast is lower when a firm is older (*AGE*), has a higher level of accruals (*ABS_ACCRUAL*), when more analysts follow a firm (*ANALYST_FOLLOWING*), during a financial crisis (*FIN_CRISIS*), and when a firm is experiencing losses (*DLOSS*). However, the propensity to issue a cash flow forecast is greater when a firm has a better information environment (*SIZE*) and is more capital-intensive (*CAP_INT*).

In Model 2, the negative and significant *CSIR_REP* coefficient (β=-0.011, p < 0.001) shows that analysts are less likely to issue a cash flow forecast when a firm has a greater level of negative media coverage regarding CSIR. The coefficient on CSIR_REP^2 (β=-0.005, p < 0.001) is also negative and significant, indicating a negative accelerating non-linear effect. In other words, the more negative a firm's CSIR reputation, the less likely an analyst is to issue a cash flow forecast. This result is consistent with the prediction in H1.

Additional Analyses

Addition Analysis I: Moderators of CSiR_REP's effect on the Likelihood of Issuing a Cash Flow Forecast.

The cash flow forecast likelihood model contains control variables affecting cash flow forecast likelihood. Our first additional analysis examined whether these variables moderated the impact of REP_RISK on cash flow forecast likelihood. We also added several firm-related variables associated with firms' characteristics and risks. The addition of these variables decreased the sample size to 34,066.

Cui et al. (2018) found that firm risk (FIRM_RISK) plays a negative mediating role between CSR and information asymmetry. They argue that high-risk firms tend to make more effort to disseminate more information to outside investors by engaging in CSR activities to avoid adverse selection and retain a good reputation, decreasing information asymmetry between insiders and outsiders.

Firms that face more litigation risk in their investment projects may choose to make more CSR investments. These firms may engage in more CSR as insurance against future litigation risks associated with CSIR issues than those with less litigation risk (Chang et al., 2018). Firms with higher litigation risks may invest more in CSR and signal the market by providing more CSR disclosures, reducing the information asymmetry between the firms and stakeholders, including

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investors (Godfrey, 2005). More CSR disclosures give analysts opportunities to process, analyze and create new information in the market, which may increase the propensity of issuing cash flow forecasts. Finally, in terms of risk variables, Chang et al. (2014) showed that institutional CSR strengths are associated with lower firm risk in volatile markets, suggesting that the insurance-like protection from CSR strengths is more salient and more valuable when markets are more volatile for firms.

Cho et al. (2013) found that the negative association between CSR performance and bid-ask spread declines for firms with a high level of institutional investors (INSTITUTIONAL_OWNERSHIP) compared with those with a low level of institutional investors, suggesting that informed investors may exploit their CSR information advantage. The adverse selection problem exists for less informed investors regarding CSR performance. Institutional ownership also captures corporate governance oversight to a degree, an important mechanism in reducing agency problems and disciplining managerial behaviors (Shleifer & Vishny, 1997).

Other firm-related variables are related to a firm's financial performance. Dong et al. (2015) found that the relationship between a reduction in analyst coverage and irresponsible corporate behaviors is driven by firms operating in concentrated industries (HHI). Their finding suggests that higher product market competition means a firm must be more cognizant of its CSIR because customers can easily switch to competitors' offerings. Luo et al. (2015) provided evidence that the effect of financial performance (ROA) on corporate social performance is enhanced when security analysts incorporate firm social performance information. We control for information environment (SIZE) because a richer information environment reduces uncertainty which may reduce the demand for analyst cash flow forecasts (Bilinski, 2014). Prior studies suggest that the managerial skills of companies with high levels of ESG performance are transferable to other firm activities. Tobin's *q* (TOBIN'S_Q) measures firm value as good corporate market activities and obtaining competitive advantages (Freeman, 1997; Schuler & Cording, 2006).

Moderation Model

$P(CFFL)_{it} = \alpha_0 + \alpha_1 SIZE_{it} + \alpha_2 ANALYST\_FOLLOWING_{it} + \alpha_3 BM_{it} + \alpha_4 AGE_{it} + \alpha_5 DLOSS_{it} + \alpha_6 FIN\_CRISIS_{it} + \alpha_7 CFO\_VOL_{it} + \alpha_8 CAP\_INT_{it} + \alpha_9 ABS\_ACCRUALS_{it} + \alpha_{10} ALTMAN\_Z_{it} + \alpha_{11} HETERO\_METHOD_{it} + \alpha_{12} OCF_{it} + \alpha_{13} HIGH\_LITIGATION\_RISK_{it} + \alpha_{14} HHI_{it} + \alpha_{15} INSTITUTIONAL\_OWNERSHIP_{it} + \alpha_{16} ROA_{it} + \alpha_{17} TOBINS\_Q_{it} + \alpha_{18} FIRM\_RISK_{it} + \alpha_{19} HIGH\_VOLATILITY_{it} + \alpha_{20} CSIR\_REP_{it} + \alpha_{21} CSIR\_REP^2{}_{it} + \alpha_{22} CSIR\_REP_{it} \times CFO\_VOL_{it} + \alpha_{23} CSIR\_REP_{it} \times CAP\_INT_{it} + \alpha_{24} CSIR\_REP_{it} \times ABS\_ACCRUALS_{it} + \alpha_{25} CSIR\_REP_{it} \times ALTMAN\_Z_{it} + \alpha_{26} CSIR\_REP_{it} \times HETERO\_METHOD_{it} + \alpha_{27} CSIR\_REP_{it} \times OCF_{it} + \alpha_{28} CSIR\_REP_{it} \times HIGH\_LITIGATION\_RISK_{it} + +\alpha_{29} CSIR\_REP_{it} \times HHI_{it} + \alpha_{30} CSIR\_REP_{it} \times INSTITUTIONAL\_OWNERSHIP_{it} + \alpha_{31} CSIR\_REP_{it} \times ROA_{it} + \alpha_{32} CSIR\_REP_{it} \times SIZE_{it} + \alpha_{33} CSIR\_REP_{it} \times TOBINS\_Q_{it} + \alpha_{34} CSIR\_REP_{it} \times FIRM\_RISK_{it} + \alpha_{35} CSIR\_REP_{it} \times HIGH\_VOLATILITY_{it} + \alpha_{36-46} YEAR\_DUMMIES + \alpha_{47-156} INDUSTRY\_DUMMIES + \varepsilon_{it}$

(2)

Results

Adjusted R^2 increased from 89.02% in Model 1 to 89.77% in Model 2, showing that the interactions explained a small additional variance (Appendix D; Table D3). The man effects model (Model 1) shows that the main effect of *CSIR_REP* is negative and significant. *CSiR_REP²* is significant in both models, showing that *CSiR_REP* affects cash flow forecast likelihood in a non-linear manner. Model 2 shows that the main effect of *CSiR_REP* is dependent on many other firm factors. Ten of the fourteen interactions were significant. Four interactions were positive: *CSIR_REP* x *CFO_VOL* ($\beta=0.358$, $p < 0.001$), *CSIR_REP* x *CAP_INT* ($\beta=0.010$, $p < 0.001$), *CSIR_REP* x *HETERO_METHOD* ($\beta=0.026$, $p < 0.001$), and *CSIR_REP* x *FIRM_RISK* ($\beta=0.259$, $p < 0.001$), suggesting that the likelihood for analysts to issue a cash flow forecast is greater for firms with worse CSIR reputations when cash flow volatility, capital intensity, heterogeneity of accounting method, or firm risk are higher.

The negative effect of CSIR_REP on HHI ($\beta=-0.375$, $p < 0.001$) indicates that the likelihood for analysts to issue a cash flow forecast is lower for firms with worse CSIR reputations when firms operate in a more concentrated and less competitive industry. The negative coefficient on CSIR_REP x HIGH_VOLATILITY ($\beta=-0.025$, $p < 0.001$) shows that analysts are less likely to issue cash flow forecasts when markets are more volatile for firms with worse CSI coverage in volatile years. CSIR_REP x ROA ($\beta=-0.022$, $p < 0.001$) and CSIR_REP x SIZE ($\beta=-0.006$, $p < 0.001$), and CSIR_REP x TOBIN'S_Q ($\beta=-0.003$, $p < 0.001$) were negative, indicating that analysts are less likely to issue cash flow forecasts when firms are more profitable, larger, or have greater firm value.

Additional Analysis II: Components of CSIR Reputation

CSIR is not a monolithic measure; it encompasses components that capture a firm's environmental, social, and corporate governance reputation. Knowledge of which specific components of CSIR's reputation drive the results in the cash flow forecast likelihood models will help uncover the determinants of analysts' likelihood to issue cash flow forecasts and the accuracy of those forecasts. There is evidence that analysts focus more on social CSIR (Hsu et al., 2019). To assist with this analysis, the RepRisk database contains variables that measure the environmental, social, and governance components of CSIR's reputation. These scores are not relative to peer industry scores as with *CSIR_REP*. Instead, RepRisk calculates these variables as the ratio of mentions of a particular component to the total number of mentions that create *CSIR_REP*. In other words, these scores capture the news composition for the firm.

Environmental, Social and Governance CSIR Reputation Variables.
To make the component scores comparable across peer companies, we multiply the firm's average environmental, social, or governance percentage by its *CSIR_REP* score to obtain environmental, social, and governance CSIR reputations (Asante-Appiah, 2020).

Models
Due to possible multi-collinearity issues, we repeated the 2SLS regression approach to test H1. However, instead of estimating overall CSIR reputation, we estimated firm-level environmental, social, and governance CSIR reputation scores in separate models. The predicted values of current environmental (*ENV_CSIR_REP*), social (*SOC_CSIR_REP*), and governance (*GOV_CSIR_REP*) reputation scores replaced *CSIR_REP* in Equations 1 and 2. We also used the control variables from Equations 1 and 2.

Results
In terms of cash flow forecast likelihood, *ENV_CSIR_REP* (Appendix D; Table D4; Model 1; β=-0.004, $p < 0.001$), *SOC_CSIR_REP* (Model 2; β=-0.003, $p< 0.001$), and *GOV_CSIR_REP* (Model 3; β=-0.011, $p < 0.001$) are significantly negative. While the environmental CSIR coefficient is smaller than the governance CSR coefficient, the adjusted R^2 is larger for Model 1 than for Model 3. In other words, Model 1, with *ENV_CSIR_REP*, explains a greater amount of the variance in cash flow forecast likelihood than. This pattern of results is the same for Peak RRI and RRI Trend models (Appendix D; Tables D5 and D6, respectively).

Additional Analysis III: CSIR Reputation in Lag Years
To examine whether a firm's *CSIR_REP* from prior years affects an analyst's likelihood to issue a cash flow forecast, we performed three additional analyses to examine the effects of lagged *CSIR_REP* (i.e., year *t-1*, *t-2*, and *t-3*). The correlation coefficient between one-year lagged *CSIR_REP* and two-year lagged *CSIR_REP* is 0.997 and highly significant. The correlation coefficient between one-year lagged *CSIR_REP* and three-year lagged *CSIR_REP* is 0.995 and highly significant. The correlation coefficient between two-year lagged *CSIR_REP* and three-year lagged *CSIR_REP* is 0.997 and highly significant. Overall, all three lagged *CSIR_REP* scores are positively correlated with each other. The variables and modeling approach is the same as those in Equation (1) and (2).

Model Results
According to Table 8, the sample size decreases for each model. There is a strong negative effect of each lagged *CSIR_REP* on the likelihood of issuing a cash flow forecast (Appendix D; Table D7; Model 1; β=-0.005, $p<0.001$, Model 2; β=-0.005, $p<0.001$, Model 3; β=-0.005, $p<0.001$). These results indicate that past CSIR reputation has a long-term effect on the likelihood of issuing a cash flow forecast.

Additional Analysis IV: When CSIR_REP is -1
A single variable may not accurately capture the difference between when *CSIR_REP* is -1 (i.e., *CSIR_REP* was never greater than 0) and *CSIR_REP* if 0 (i.e., CSIR_REP was greater than 0 at some point in the past). Thus, we added a dummy variable to the model, *CSIR_NEG*, that takes the value of 1 when CSIR_REP=-1 and 0 otherwise.

Model Results
The results are similar to Table 3 (H1). The results for H1 still hold; that is, firms with worse CSIR reputations are less likely to have analysts issue cash flow forecasts. The sign, significance, and magnitude of the CSiR coefficients are the same (Appendix D; Table D8, Model 1, and Model 2). The *CSIR_NEG* coefficient is negative and significant (β=-0.020, $p < 0.001$), indicating a reduced chance of cash flow forecast likelihood if CSiR was never above zero. However, the adjusted R-square increased from 80.77% to 80.78%, meaning that *CSIR_NEG* only explains very little variance.

DISCUSSIONS
The paper explores the association between financial analysts' forecast behavior and CSR reputation. Based on a large panel sample with over 50,000 firm-year observations over 12 years, the paper finds that analysts are less likely to provide cash flow forecasts for firms with poor CSR reputations. Additional analyses document that firm- and industry-related factors moderate this relationship.

We examine the issuance of cash flow forecasts from the analysts' supply side. An opposing viewpoint may suggest that a low CSIR reputation would increase investors' demand for analysts' cash flow forecasts. However, our results indicate that analysts may need to pay more attention to any increase in demand and are less likely to issue cash flow forecasts for firms with low CSIR reputations. Even if one adopted a demand-side perspective, it needs to be clarified whether CSR reputation is just another empirical proxy for the same conceptual construct (e.g., risk of earnings manipulation) that has already been examined by prior literature (DeFond & Hung, 2003). For example, the discussion of Kim et al. (2012), who find that poor CSR is associated with a higher likelihood of earnings management, supports such an interpretation. In sum, there is strong evidence that the uncertainty associated with a negative CSIR reputation affects the supply of cash flow forecasts. These findings add to the literature correlating cash flow forecasts with firms with underlying financial concerns (DeFond & Hung, 2007).

Our study is important for several reasons. First, we investigate reputation rather than firm-controlled disclosures. This distinction is important because stakeholders' perception of firm CSR activities may not align with firm actions (e.g., Peloza et al., 2012), and stakeholder sanctions are situationally dependent (Nardella et al., 2020). Thus, even if FASB mandated reporting of CSIR issues, it still would be important to monitor the reputational impact of these activities.

Second, our results contribute to the knowledge base of accounting CSIR literature. This stream of literature is important due to the salience of CSIR (Dhaliwal et al., 2014) and its effects on the firm (Bozzolan et al., 2015). Our third and closely intertwined contribution regards cash flows. Our results show that CSIR's reputation is an important metric to analysts regarding cash flow statements, a sentiment echoed by existing research on CSIR's reputation and audit efforts (Asante-Appiah, 2020) and audit fees (Burke et al., 2019). Researchers have found that cash flow surprises (i.e., incorrect cash flow forecasts) affect the value of firms (e.g., Brown et al., 2013) and their bonds (Kim et al., 2015). Therefore, investors may wish firms to apprise them of CSIR's reputation's role in determining a company's earnings. Past research has found that cash flow forecasts increase firm tax avoidance activities (Ayers et al., 2018) and decrease auditor fees (Mao & Yu, 2015). Thus, governing bodies such as the SEC may wish to make information about CSIR's reputation more readily available to the general public through mandatory or integrated reporting (Zhou et al., 2017).

CONCLUSIONS

The irresponsible social behavior of a firm is a concern important to numerous stakeholders, including those interested in firm finances, namely investors (Gloßner, 2017), tax regulators (Hasan et al., 2017), bond rating agencies (Chiang et al., 2017), and auditors (Asante-Appiah, 2020). Our study extends this literature stream by offering insights into CSIR's reputation's role in the likelihood of analysts' issuance of cash flow forecasts. The results indicate that analysts are less likely to issue a cash flow forecast as a firm's CSIR reputation worsens. This decrease in cash flow forecast issuance likelihood occurs, even if the poor CSIR reputation is from as long ago as three years prior or is due to environmental, social, or governance issues. Moreover, increases in cash flow volatility and capital intensity positively moderate the likelihood of issuing a cash flow forecast, while increases in ROA and Tobin's q negatively moderate the likelihood of issuing a cash flow forecast.

The importance and reporting of intangible assets have increased as countries have shifted to information and service economies (Castilla-Polo & Gallardo-Vázquez, 2016). Indeed, traditional financial statements do not fully inform management and investors about the value of a firm reputation, quality, brand equity, safety, workplace culture, strategies, and other assets that are more significant than ever in a knowledge-based global economy. Intangible assets account for a significant proportion of the value of a company, especially in the long term (e.g., Clout & Willett, 2016). Part of RepRisks' methodology accounts for the quantity of media-generated information. While this methodology can capture the breadth and depth of information surrounding a firm's CSIR, it also may indicate a firm's actual CSIR activities. Cash flow forecast accuracy improves as CSIR's reputation worsens, which indicates that CSIR's reputation plays an information asymmetry-reducing role akin to CSR (Cui et al., 2018).

Cash flow forecasts in and of themselves are not indications of a firm's financial or social health. Nor does CSIR's reputation necessarily capture a firm's true CSIR activities. Thus, our research does not comment on the negative firm or societal effects of CSIR's reputation with cash flow forecasts. However, a poor CSIR reputation is associated with a decrease in cash flow forecast likelihood (this paper), increases in firm risk (Kölbel et al., 2017), and decreases in stock returns (Gloßner, 2017). Future research can explore the association between CSIR's reputation and more salient metrics covered by analysts, such as revenue forecasts.

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APPENDICES

Appendix A: Scope of CSIR Issues

RepRisk category	Issues
Environmental footprint	Global pollution and climate change
	Local pollution
	Impact on ecosystems and landscapes
	Overuse and wasting of resources
	Waste issues
	Animal mistreatment
Community relations	Human rights abuses, corporate complicity
	Impact on communities
	Local participation issues
	Social discrimination
Employee relations	Forced labor
	Child labor
	Freedom of association and collective bargaining
	Discrimination in employment
	Health and safety issues
	Poor employment conditions
Corporate governance	Corruption, bribery, extortion, money laundering
	Executive compensation
	Misleading communication, e.g., greenwashing
	Fraud
	Tax evasion
	Anti-competitive practices
Cross-category	Controversial products and services
	Products (health and environmental issues)
	Violation of international standards
	Violation of national legislation
	Supply chain (environmental, social, and legal issues)

The scope of pre-defined issues was in accordance with international standards and norms, including the UN Global Compact's Ten Principles, the Universal Declaration of Human Rights, the Conventions of the International Labour Organization (ILO), the UN Convention against Corruption, the World Bank Environmental, Health, and Safety Guidelines, and the Organization for Economic Co-operation and Development (OECD) Guidelines for Multinational Enterprises (Kölbel et al., 2017).

Appendix B: RepRisk CSIR Reputation Measurements

CSIR proxy	Definition
RepRisk Index (RRI)	RRI is based on RepRisk's proprietary algorithm that captures and measures reputational risk exposure associated with CSIR.
Current RRI	Current RRI denotes the current level of media and stakeholder exposure of a company related to CSIR. Current RRI varies between zero (lowest exposure) and 100 (highest exposure). The higher the value, the higher the risk exposure.
RRI Trend	Difference in the RRI between the current date and 30 days ago. RRI Trend or change monitors the progress of the risk exposure of a company related to CSIR, or as an indication of when a risk incident has occurred for a company.
Peak RRI	Peak RRI represents the highest level of reputational risk exposure related to CSIR over the last 2 years. It shows the overall CSIR-related reputational risk exposure is the main metric used in analyzing the risk exposure of a company.

Source: https://wrds-www.wharton.upenn.edu/pages/about/data-vendors/reprisk/

Appendix C1: Variable Definitions

All models		
CSIR reputation	CSIR_REP	Current RRI (RepRisk). A -1 score indicates that the firm has never had a CSIR_REP score above 0. A 0 score indicates that the current score is 0 but was once above 0.
Age	AGE	Firm age (based on year added to Compustat).
Firm size	SIZE	Natural log (1 + equity market capitalization) (Compustat).
Book-to-Market	BM	Equity book value divided by equity market value (Compustat).
Industry dummies	Industry FE	Industry dummies based on SIC classification (Compustat).
Year dummies	Year FE	Calendar-year dummies (Compustat).
Cash flow volatility	CFO_VOL	The firm-specific standard deviation of the operating cash flows divided by lagged assets. The previous 8 years are used to calculate the standard deviation (minimum 4 years) (Compustat).
Operating cash flows	OFF	Operating cash flows / (average total assets from beginning to end of the period) (Compustat).
Cash flow forecast issuance likelihood model: First stage		
Current CSIR Rep. Average	CSIR_REP_AVG	Current RRI mean-adjusted value (RepRisk).
Peak CSIR Rep. Average	PEAK_CSIR_REP_AVG	Peak RRI mean-adjusted value (RepRisk).
CSIR Rep. Change Average	CSIR_REP_CHG_AVG	RRI Trend mean-adjusted value (RepRisk).
Cash flow forecast issuance likelihood model: Second stage		
Likelihood of cash flow forecast	CFF_LIKELIHOOD	Indicator variable that takes the value of one if at least one cash flow forecast is issued by analysts during the fiscal quarter, and zero otherwise (I/B/E/S).
Accruals	ABS_ACCRUALS	|earnings minus operating cash flows divided by average total assets|. Earnings are income before extraordinary items (Compustat).
Capital intensity	CAP_INT	Gross property, plant, & equipment / average assets (Compustat).
Altman Z-score	ALTMAN_Z	1.2 (net working capital / total assets) + 1.4 (retained earnings / total assets) + 3.3 (earnings before interest and taxes / total assets) + 0.6 (market value of equity / book value of liabilities) + 1.0 (sales / total assets) (Compustat).
Accounting method heterogeneity	HETERO_METHOD	An index ranging from 0 to 1 that captures the comparability of a firm's accounting choice with its industry peers. The index is computed by assigning a value of one to each firm whose accounting choice differs from the most frequently chosen method in that firm's industry group, for each of the following five accounting choices: (1) inventory valuation; (2) investment tax credit; (3) depreciation; (4) successful-efforts vs. full-cost for companies with extraction activities; and (5) purchase vs. pooling. If a firm has no information or a missing value for a given accounting choice, the choice is coded as zero. The score for each firm is summed and then scaled by the number of accounting choices in the industry: 5 for firms in the petroleum and natural gas industry (because they are eligible for all 5 choices); 3 for firms in banking, insurance, real estate, and trading industries (because they have no inventory choice and are not extractive industries); and 4 for firms in all other industries (because they are not extractive industries).
Analyst following	ANALYST_FOLLOWING	Natural log of the number of analysts following the firm (I/B/E/S).
Loss	GLOSS	Indicator variable equals one if earnings before extraordinary items and discontinued operations are negative and zero otherwise (Compustat).
Financial crisis	FIN_CRISIS	An indicator for the financial-crisis period (2007-2009; BEA).

Appendix C2: Additional Variable Definitions

Moderator variables		
Litigation Risk	HIGH_LITIGATION_RISK	Indicator variable that is equal to one if a firm is in litigious industries (i.e., Chemicals, Industrial and Commercial Machinery, Electronic and other Electrical Equipment, Retail Trade), and zero otherwise.
Herfindal-Hirschman Index		the industrial Herfindal-Hirschman Index (HHI). For each two-digit SIC industry, j, the concentration level of the sales for each year t is calculated.
Institutional Ownership	INSTITUTIONAL_OWNERSHIP	the standardized percentage of institutional ownership for firm i at the end of the fiscal year.
Return on Assets	ROA	EBIT/total assets
Firm Size	SIZE	Log of total assets
Growth	TOBIN'S_Q	The sum of market value of the company's equity and book values of its debt minus book value of total assets divided by total assets
Firm Risk	FIRM_RISK	The annual average of the standard deviation of monthly stock returns.
Volatile Years	HIGH_VOLATILITY	Indicator variable equal to 1 if the year is during the recession years between 2007 and 2009 and dot.com bubble burst years between 2000 and 2002 and 0 in other years.
Additional analyses models		

Environmental CSIR reputation	ENV_CSIR_REP	Firm average environmental percentage for the fiscal year multiplied by its CSIR_REP (RepRisk).
Social CSIR reputation	SOC_CSIR_REP	Firm average social percentage for the fiscal year multiplied by its CSIR_REP (RepRisk).
Governance CSIR reputation	GOV_CSIR_REP	Firm average governance percentage for the fiscal year multiplied by its CSIR_REP (RepRisk).

Appendix D: Supporting Tables

Table D1. Sample selection (number of observations)

	CFFL Model
All Compustat observations from 2007 to 2016	317,624
Matched Compustat and RepRisk observations	288,163
Matched Compustat, RepRisk and Institutional Ownership observations	147,776
Matched Compustat, RepRisk, Institutional Ownership, and IBES observations	84,754
Total observations used in the main multivariate analyses	50,365

Table D2. The first-stage regression to predict CSIR_REP

Variables	Coeff.		S.E.
Intercept	-11.695	***	0.087
CSIR_REP_AVG	0.949	***	0.005
PEAK_CSIR_REP_AVG	-0.07	***	0.001
CSIR_REP_CHG_AVG	-0.002		0.005
SIZE	1.529	***	0.01
AGE	0.042	***	0.002
Year FE		Yes	
Industry FE		Yes	
No. of obs.		313,701	
Adjusted R^2		67.88%	

Variables definitions are in Appendix C. Robust standard errors are corrected for firm-level clustering and heteroskedasticity. *, **, *** denote significance at 10%, 5%, and 1% levels, respectively.

Table D3. Additional Analysis I: The Moderating Role of Earnings Volatility, Capital Intensity, Financial Health, and Operating Cash Flow

Variables	Model 1: Main Effects		Model 2: Interactions	
	Coeff.	S.E.	Coeff.	S.E.
Intercept	0.743 ***	0.142	0.578 ***	0.133
SIZE	0.118 ***	0.004	0.126 ***	0.014
ANALYST_FOLLOWING	-0.365 ***	0.001	-0.370 ***	0.001
BM	-0.009	0.009	-0.014 *	0.008
AGE	-0.013 ***	0.001	-0.015 ***	0.001
GLOSS	-0.039 ***	0.005	-0.013 **	0.006
FIN_CRISIS	0.045 ***	0.006	0.045 ***	0.006
CFO_VOL	0.751 ***	0.093	1.360 ***	0.089
CAP_INT	0.086 ***	0.011	0.126 ***	0.014
ABS_ACCRUALS	-0.558 ***	0.080	-0.864 ***	0.053
ALTMAN_Z	0.009 ***	0.001	0.008 ***	0.001
OFF	0.067 **	0.028	0.035 *	0.021
HETERO_METHOD	-0.038 ***	0.010	-0.078 ***	0.010
HIGH_LITIGATION_RISK	-0.825 ***	0.168	-0.547 ***	0.160
HI	-2.880 ***	0.872	-2.885 ***	0.955
INSTITUTIONAL_OWNERSHIP	-0.040 ***	0.011	0.008	0.012
ROA	-0.033	0.043	-0.116	0.107
TOBIN'S Q	-0.021 ***	0.003	-0.031 ***	0.003
FIRM_RISK	0.668 ***	0.110	0.320 ***	0.109
HIGH_VOLATILITY	-0.234 ***	0.026	-0.231 ***	0.026
CSIR_REP	-0.028 ***	0.001	-0.002	0.006
CSIR_REP^2	-0.008 ***	0.000	-0.005 ***	0.000
CSIR_REP x CFO_VOL			0.358 ***	0.030
CSIR_REP x CAP_INT			0.010 ***	0.002
CSIR_REP x ABS_ACCRUALS			-0.195 ***	0.025
CSIR_REP x ALTMAN_Z			0.001	0.000
CSIR_REP x OCF			0.012	0.010
CSIR_REP x HETERO_METHOD			0.026 ***	0.004
CSIR_REP x HIGH_LITIGATION_RISK			0.005	0.009
CSIR_REP x HHI			-0.375 ***	0.132
CSIR_REP x INSTITUTIONAL_OWNERSHIP			-0.002	0.003
CSIR_REP x ROA			-0.022 **	0.011
CSIR_REP x SIZE			-0.006 ***	0.001

	Coeff.		S.E.
CSIR_REP x TOBIN'S_Q	-0.003	***	0.001
CSIR_REP x FIRM_RISK	0.259	***	0.039
CSIR_REP x HIGH_VOLATILITY	-0.025	***	0.002
Year FE	Yes		Yes
Industry FE	Yes		Yes
No. of obs.	34,066		34,066
Adjusted R^2	89.02%		89.77%

Variable definitions are in Appendix C. Robust standard errors are corrected for firm-level clustering and heteroskedasticity. *, **, *** denote significance at 10%, 5%, and 1% levels, respectively. Increase in CSIR_REP = greater irresponsible perception. Lower CFF_LIKELIHOOD = less likely to issue a forecast.

Table D4. Additional Analysis II: Components of CSIR Reputation and Current RRI

	Model 1: ENV_CSIR_REP			Model 2: SOC_CSIR_REP			Model 3: GOV_CSIR_REP		
Variables	Coeff.		S.E.	Coeff.		S.E.	Coeff.		S.E.
Intercept	0.302	***	0.062	0.002		0.103	-0.023		0.103
SIZE	0.108	***	0.002	0.121	***	0.002	0.122	***	0.002
ANALYST_FOLLOWING	-0.335	***	0.001	-0.298	***	0.002	-0.298	***	0.002
BM	0.003		0.004	0.014	***	0.004	0.012	***	0.004
AGE	-0.003	***	0.000	-0.004	***	0.000	-0.004	***	0.000
GLOSS	-0.026	***	0.005	0.004		0.005	0.000		0.005
FIN_CRISIS	-0.126	***	0.011	-0.138	***	0.012	-0.128	***	0.012
CFO_VOL	0.173		0.125	0.232	**	0.108	0.227	**	0.105
CAP_INT	0.050	***	0.007	0.060	***	0.008	0.059	***	0.008
ABS_ACCRUALS	-0.185	***	0.047	-0.179	***	0.046	-0.186	***	0.047
ALTMAN_Z	0.000		0.000	-0.003	***	0.001	-0.003	***	0.001
OFF	0.152	***	0.029	0.106	***	0.022	0.109	***	0.024
HETERO_METHOD	0.049	***	0.009	0.118	***	0.011	0.115	***	0.011
CSIR_REP_X	-0.004	***	0.000	-0.003	***	0.000	-0.011	***	0.001
CSIR_REP_X^2	0.000	**	0.000	0.000	***	0.000	-0.001	***	0.000
Year FE	Yes			Yes			Yes		
Industry FE	Yes			Yes			Yes		
No. of obs.	50,365			50,164			50,164		
Adjusted R^2	80.08%			71.30%			71.44%		

Variables definitions are in Appendix C. Robust standard errors are corrected for firm-level clustering and heteroskedasticity. *, **, *** denote significance at 10%, 5%, and 1% levels, respectively. Increase in CSIR_REP=worse CSIR reputation. Lower CFF_LIKELIHOOD=less likely to issue a forecast.

Table D5. Additional Analysis II: Components of CSIR Reputation and Peak RRI

	Model 1: ENV_CSIR_REP			Model 2: SOC_CSIR_REP			Model 3: GOV_CSIR_REP		
Variables	Coeff.		S.E.	Coeff.		S.E.	Coeff.		S.E.
Intercept	0.297	***	0.063	-0.001		0.103	-0.016		0.102
SIZE	0.108	***	0.002	0.121	***	0.002	0.121	***	0.002
ANALYST_FOLLOWING	-0.334	***	0.001	-0.297	***	0.002	-0.298	***	0.002
BM	0.003		0.004	0.014	***	0.004	0.013	***	0.004
AGE	-0.003	***	0.000	-0.004	***	0.000	-0.004	***	0.000
GLOSS	-0.025	***	0.005	0.004		0.005	0.003		0.005
FIN_CRISIS	-0.119	***	0.011	-0.135	***	0.012	-0.134	***	0.012
CFO_VOL	0.182		0.129	0.243	**	0.112	0.227	**	0.106
CAP_INT	0.051	***	0.007	0.061	***	0.008	0.060	***	0.008
ABS_ACCRUALS	-0.175	***	0.048	-0.178	***	0.046	-0.164	***	0.045
ALTMAN_Z	0.000		0.000	-0.002	***	0.001	-0.003	***	0.001
OFF	0.160	***	0.031	0.110	***	0.023	0.110	***	0.023
HETERO_METHOD	0.050	***	0.009	0.116	***	0.011	0.117	***	0.011
CSIR_REP_X	-0.004	***	0.000	-0.004	***	0.000	-0.006	***	0.000
CSIR_REP_X^2	0.000	***	0.000	0.000	***	0.000	0.000	***	0.000
Year FE	Yes			Yes			Yes		
Industry FE	Yes			Yes			Yes		
No. of obs.	50,365			50,164			50,164		
Adjusted R^2	80.05%			71.33%			71.40%		

Variables definitions are in Appendix C. Robust standard errors are corrected for firm-level clustering and heteroskedasticity. *, **, *** denote significance at 10%, 5%, and 1% levels, respectively. Increase in CSIR_REP=worse CSIR reputation. Lower CFF_LIKELIHOOD=less likely to issue a forecast.

Table D6. Additional Analysis II: Components of CSIR Reputation and RRI Trend

	Model 1: ENV_CSIR_REP			Model 2: SOC_CSIR_REP			Model 3: GOV_CSIR_REP		
Variables	Coeff.		S.E.	Coeff.		S.E.	Coeff.		S.E.
Intercept	0.305	***	0.062	0.006		0.103	-0.014		0.103

SIZE	0.108	***	0.002	0.120	***	0.002	0.122	***	0.002
ANALYST_FOLLOWING	-0.336	***	0.001	-0.298	***	0.002	-0.299	***	0.002
BM	0.003		0.004	0.014	***	0.004	0.012	***	0.004
AGE	-0.003	***	0.000	-0.004	***	0.000	-0.004	***	0.000
GLOSS	-0.023	***	0.005	0.005		0.005	0.002	*	0.005
FIN_CRISIS	-0.126	***	0.011	-0.140	***	0.012	-0.130	***	0.012
CFO_VOL	0.172	***	0.125	0.233	**	0.109	0.224	**	0.105
CAP_INT	0.050	***	0.007	0.060	***	0.008	0.059	***	0.008
ABS_ACCRUALS	-0.176	***	0.048	-0.174	***	0.046	-0.172	***	0.046
ALTMAN_Z	0.000		0.000	-0.003	***	0.001	-0.003	***	0.001
OFF	0.158	***	0.030	0.110	***	0.023	0.114	***	0.024
HETERO_METHOD	0.049	***	0.009	0.118	***	0.011	0.115	***	0.011
CSIR_REP_X	-0.003	***	0.000	-0.003	***	0.000	-0.009	***	0.001
CSIR_REP_X^2	0.000	***	0.000	0.000	***	0.000	0.000	***	0.000
Year FE		Yes			Yes			Yes	
Industry FE		Yes			Yes			Yes	
No. of obs.		50,365			50,164			50,164	
Adjusted R^2		80.06%			71.30%			71.42%	

Variables definitions are in Appendix C. Robust standard errors are corrected for firm-level clustering and heteroskedasticity. *, **, *** denote significance at 10%, 5%, and 1% levels, respectively. Increase in CSIR_REP=worse CSIR reputation. Lower CFF_LIKELIHOOD=less likely to issue a forecast.

Table D7. Additional Analysis III: CSIR Reputation in Lag Years

	Model 1: CSIR_REP t-1		Model 2: CSIR_REP t-2		Model 3: CSIR_REP t-3	
Variables	Coeff.	S.E.	Coeff.	S.E.	Coeff.	S.E.
Intercept	0.692 ***	0.062	0.698 ***	0.062	0.689 ***	0.064
SIZE	0.089 ***	0.003	0.090 ***	0.004	0.091 ***	0.004
ANALYST_FOLLOWING	-0.348 ***	0.001	-0.348 ***	0.001	-0.349 ***	0.001
BM	0.022 ***	0.008	0.025 ***	0.008	0.029 ***	0.006
AGE	-0.017 ***	0.001	-0.017 ***	0.001	-0.018 ***	0.001
GLOSS	-0.005 ***	0.007	-0.005	0.007	-0.005	0.007
FIN_CRISIS	-0.293 ***	0.031	-0.285 ***	0.024	-0.284 ***	0.023
CFO_VOL	1.176 ***	0.144	1.187 ***	0.167	1.212 ***	0.190
CAP_INT	0.045 ***	0.012	0.041	0.011	0.041	0.011
ABS_ACCRUALS	-0.515 ***	0.114	-0.531 ***	0.117	-0.571	0.124
ALTMAN_Z	0.001	0.001	0.002 **	0.001	0.003 ***	0.001
OFF	0.072 **	0.034	0.070 ***	0.033	0.071 **	0.033
HETERO_METHOD	0.005	0.010	0.003	0.010	0.003	0.010
CSIR_REP	-0.005 ***	0.000	-0.005 ***	0.000	-0.005 ***	0.000
CSIR_REP^2	0.000 ***	0.000	0.000 ***	0.000	0.000 ***	0.000
Year fixed effect	Yes		Yes		Yes	
Industry fixed effect	Yes		Yes		Yes	
N	31,745		31,698		31,592	
Adjusted R^2	82.48%		82.50%		82.55%	

Variables definitions are in Appendix C. Robust standard errors are corrected for firm-level clustering and heteroskedasticity. *, **, *** denote significance at 10%, 5%, and 1% levels, respectively. Increase in CSIR_REP=worse CSIR reputation. Lower CFF_LIKELIHOOD=less likely to issue a forecast.

Table D8. Additional Analysis IV: When CSIR_REP is -1

	Model 1: Table 7 Main Effect		Model 2: Additional of CSIR_NEG	
Variables	Coeff.	S.E.	Coeff.	S.E.
Intercept	0.278 ***	0.062	0.352 ***	0.063
SIZE	0.120 ***	0.002	0.112 ***	0.003
ANALYST_FOLLOWING	-0.339 ***	0.001	-0.339 ***	0.001
BM	0.003 ***	0.003	0.003 ***	0.003
AGE	-0.002 ***	0.000	-0.003 ***	0.000
GLOSS	-0.021 ***	0.005	-0.022 ***	0.005
FIN_CRISIS	-0.122 ***	0.011	-0.116 ***	0.011
CFO_VOL	0.196 ***	0.135	0.196 ***	0.135
CAP_INT	0.060 ***	0.007	0.060 ***	0.007
ABS_ACCRUALS	-0.179 ***	0.045	-0.182 ***	0.045
ALTMAN_Z	0.053 ***	0.008	-0.001 ***	0.000
OFF	0.100 ***	0.026	0.100 ***	0.026
HETERO_METHOD	-0.001 ***	0.000	0.053 ***	0.008
CSIR_REP (H1)	-0.011 ***	0.001	-0.007 ***	0.002
CSIR_REP^2	-0.005 ***	0.001	-0.005 ***	0.000
CSIR_NEG			-0.020 ***	0.004
Year FE	Yes		Yes	
Industry FE	Yes		Yes	
No. of obs.	50,365		50,365	

Adjusted R^2	80.77%	80.78%

Variables definitions are in Appendix C. Robust standard errors are corrected for firm-level clustering and heteroskedasticity. *, **, *** denote significance at 10%, 5%, and 1% levels, respectively. Increase in CSIR_REP = worse CSIR reputation. Lower CFF_LIKELIHOOD = less likely to issue a forecast.