Repeat Offenders: ESG Incident Recidivism and Investor Underreaction

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Abstract

This paper captures poor environmental, social, and governance (ESG) practices based on a firm's history of negative ESG incidents. I find that firms' past ESG incident rates predict more future incidents, weaker profitability, and lower risk-adjusted stock returns. These abnormal returns are consistent with markets underreacting to incidents, as past incident rates also predict larger analyst forecast errors, more negative stock price reactions when firms announce their quarterly earnings or have subsequent incidents, and more pronounced abnormal returns in firms with weaker investor attention. I further document that ESG-aware mutual funds profit from this underreaction. Overall, these findings suggest that the negative long-term value implications of poor ESG practices are not fully reflected in stock prices.

JEL-Classification: G11; G14; M14
Keywords: ESG incidents, Corporate sustainability, Corporate social responsibility, Socially responsible investment, Managerial myopia, Limited investor attention

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1. Introduction

Corporations increasingly integrate environmental, social, and governance (ESG) issues into their business practices.[1] This development has spurred a debate on whether companies can become more profitable by creating societal value,[2] but there is less evidence on the performance implications of poor ESG practices. For example, the case of BP illustrates that a long history of environmental and safety incidents may lead to the Deepwater Horizon oil spill and billions of losses.[3] Given the large negative externalities that can result from poor ESG practices, a more systematic investigation of this topic is needed.

In this paper, I examine how companies with poor ESG practices perform and how these are valued by the stock market. I propose capturing poor ESG practices based on a firm's history of negative ESG incidents. This approach is better at predicting future incidents and hence at identifying companies that neglect their stakeholders than relying on previously used ESG ratings, which often disagree with each other.[4] Using this novel approach, I document that firms with worse ESG practices underperform in terms of both future profitability and risk-adjusted stock returns. These abnormal returns appear to originate from stock markets underestimating the adverse value implications of poor ESG practices, as stock prices react negatively when these firms announce their weaker earnings or have more subsequent incidents. I further show that this underreaction is more pronounced in firms where investor attention is weaker and that ESG-aware mutual funds profit from this market inefficiency.

Theoretically, it is unclear how poor ESG practices impact firm performance. On the one hand, poor ESG practices may arise from a strong shareholder focus and high cost efficiency.

[1] Over 11,000 firms have signed the UN Global Compact, the world's largest corporate sustainability initiative (Compact 2020), and 181 CEOs of the largest US companies declared in 2019 that their companies serve all of their stakeholders and not only their shareholders (Business Roundtable 2019).

[2] Some argue that better corporate sustainability can increase shareholder value (Edmans 2020; Edmans 2011; Dimson, Karakaş, and Li 2015; Flammer 2015; Ferrell, Liang, and Renneboog 2016), but this literature is not without critics (Hong, Kubik, and Scheinkman 2012; Cheng, Hong, and Shue 2016; Masulis and Reza 2015).

[3] In 2007 alone, BP paid US-$ 373 million in lawsuits that result from the Texas City refinery explosion, pipeline leaks in Alaska, and attempts to manipulate the propane market. In 2009, one year before the Deepwater Horizon oil spill, BP was again imposed with US-$ 87 million in penalties for safety violations and unresolved problems at its Texas City refinery. See Cherry and Sneirson (2011) and Shefrin and Cervellati (2011) on the case of BP.

[4] See Chatterji et al. (2016), Berg, Koelbel, and Rigobon (2019), and Gibson Brandon et al. (2019).

A long literature emphasizes that businesses should focus on profits and not on social welfare (Friedman 1970; Jensen 2002). Exaggerating this view, companies may maximize shareholder value by spending less on their stakeholders' needs or on protecting the environment. On the other hand, Bénabou and Tirole (2010) argue that poor ESG practices may be the result of managerial short-termism. While ignoring ESG policies and practices can increase profits over the short term, it may negatively impact long-term value through a higher probability of ESG incidents (Bénabou and Tirole 2010), reputational damage (Fombrun 1996; Fombrun and Shanley 1990), and less social capital and trust (Lins, Servaes, and Tamayo 2017).

Given that the value implications of ESG issues are subject to debate, this paper also considers the potential stock market underreaction to negative ESG information. Valuing poor ESG practices is difficult because investors need to evaluate the costs of ESG investments against increased ESG business risks. Prior literature suggests that capital markets tend to underestimate the value of intangible assets, including certain aspects of corporate sustainability.[5] While stock market efficiency with respect to ESG information should improve with the growing interest in ESG, there are still significant hurdles to ESG investing. Recent evidence shows that US institutional investors do not "walk the talk" with regard to their responsible commitments (Gibson Brandon et al. 2020). Survey data finds that about one-fifth of investment professionals do not use ESG information at all, with lack of comparable and reliable ESG information emerging as the largest barrier (Amel-Zadeh and Serafeim 2017). Research on third-party ESG data confirm substantial disagreement between ESG ratings (e.g., Chatterji et al. 2016).

If poor ESG practices have adverse effects on long-term firm performance and if investors underreact to this link because of the obstacles involved in estimating the economic implications of ESG issues, then firms with worse ESG practices will be overvalued relative to firms with better ESG practices. In this case, we should observe a negative relation between poor ESG practices and both future stock returns and operating performance.

[5]Previous papers find that stock markets underestimate innovation (e.g., Chan, Lakonishok, and Sougiannis 2001; Cohen, Diether, and Malloy 2013; Hirshleifer, Hsu, and Li 2013; Hirshleifer, Hsu, and Li 2018), corporate governance (e.g., Gompers, Ishii, and Metrick 2003), employee satisfaction (Edmans 2011; Edmans, Li, and Zhang 2017), and top management diversity (Manconi, Rizzo, and Spalt 2017).

To test this joint hypothesis, I propose measuring poor ESG practices based on a firm's past incident rate, which quantifies the frequency and severity of negative ESG incidents (e.g., environmental pollution, poor employment conditions, or anti-competitive practices).[6] The incident news comes from RepRisk. My sample has over 80,000 incident news of about 2,900 unique firms listed in US stock markets between 2007 and 2017.

The conceptual advantage of incident-based ESG measures is that these capture poor ESG practices based on firms' past behavior, through realizations of ESG-related business risks and criticism raised by stakeholders themselves. Often past behavior is the best available predictor of future behavior. This idea is applied in many contexts: for example, a bank estimates the default risk of consumers based on their payment history. Prior research on ESG practices, by contrast, mostly uses conventional ESG ratings (e.g., MSCI IVA), but it is unclear what these ratings measure given that these aggregate hundreds of ESG criteria into one company score using different approaches. As a result, these ratings often disagree with each other (e.g., Chatterji et al. 2016) and are not correlated with future corporate misbehavior (Yang 2020).

Consistent with these arguments, I show that there is a strong positive correlation between past incident rates and the realization of future incidents. About half of all new incidents happen at companies that already had high incident rates. When comparing incident rates to conventional ESG ratings, I document that ESG ratings exhibit less predictive power for future incident news. More concerning, conventional ESG ratings become less informative and disagree more when a firm had more incidents.[7] These results emphasize that incident-based measures are a better proxy for poor ESG practices than conventional ESG ratings.

Two main findings emerge from the analysis of firms' incident histories. First, I find that past incident rates predict significantly lower firm profitability over the next year. This finding is robust to different profitability measures, extensive controls, and industry and firm fixed effects.

[6] I do not drop governance incidents, such as tax optimization, misleading communication, or excessive CEO salaries, because these incidents are likely different from what is captured by the shareholder rights indexes in the corporate governance literature (Gompers, Ishii, and Metrick 2003; Bebchuk, Cohen, and Ferrell 2009). Robustness tests show that my results are not driven by differences in shareholder rights.

[7] The rating disagreement may arise because companies with high incident rates offset their higher number of ESG weaknesses with more strengths in other ESG criteria, according to KLD ratings. As a result, companies with more incidents have no lower net KLD score (defined as strengths minus weaknesses).

Negative event returns around news about ESG incidents support this interpretation and alleviate concerns about omitted variable bias.

Second, I find negative long-run stock returns. A value-weighted US portfolio with high ESG incident rates is associated with a negative alpha of about -3.5% per year. The pattern is robust to different risk factors, industry controls, removing outliers, and other checks. Stock-level regressions that control for many return predictors confirm that ESG incident rates predict lower returns. To combat "data-mining" concerns, I run an out-of-sample test based on international stock data and find that a European portfolio with high ESG incident rates also significantly underperforms the markets by -2.5% per year. These findings suggest that firms with poor ESG practices underperform their peers in terms of operating and stock performance.

The remainder of my paper explores the mechanisms behind these negative stock returns. To differentiate between explanations based on differences in risk or stock markets underreacting to ESG incidents, I study analyst forecast errors and investor surprises. The evidence points toward underreaction: Past ESG incident rates predict negative sell-side earnings surprises, suggesting that analysts overestimate the earnings of firms with high incident rates. Consistent with this, two event-study tests provide evidence that investors are negatively surprised when firms with past high ESG incident rates announce their quarterly earnings or have subsequent incident news. These firms exhibit -1.4% p.a. cumulative abnormal returns during quarterly earnings announcements and -0.7% p.a. cumulative abnormal returns during subsequent incident news. Taken together, the two channels can explain about three-fifths of the lower stock returns associated with ESG incident rates—and are consistent with investor surprises.

To interpret the evidence of investor surprises, I hypothesize that investors underreact because they are inattentive to the information contained in a firm's history of ESG incidents. Limited attention theory assumes that investors absorb salient, easily processable information to a higher degree than non-salient information (e.g., Hirshleifer and Teoh 2003). While incident news themselves are salient, processing their value implications is difficult due to ESG rating disagreement, the need to separate material from immaterial ESG information, the long-term nature of ESG, lack of standardized ESG reporting, and potential "greenwashing" activities by corporations (see

e.g., Christensen, Hail, and Leuz 2019).

Limited attention models imply that the stock underreaction increases with a higher fraction of inattentive investors, greater uncertainty about future firm cash flows, and with lower overall investor attention (Hirshleifer, Hsu, and Li 2018). Intuitively, if a firm receives less attention, investors may be less likely to decipher the value of intangible assets that are generally more difficult to value (e.g., ESG practices). I test these implications by using short-term ownership, analyst forecast dispersion, and analyst coverage as proxies for ESG-inattentive shareholders, firm opaqueness, and overall investor attention, respectively. Consistent with all three implications, high ESG incident rates predict more pronounced negative stock returns in firms with more short-term ownership, higher analyst forecast dispersion, and lower analyst coverage. These findings showcase that limited investor attention is a channel that explains the market underreaction.

Do ESG-aware investors profit from this market inefficiency? Pedersen, Fitzgibbons, and Pomorski (2019) point out that if stock markets underreact to certain material ESG information, investors that incorporate the neglected information into their investment decisions should outperform. Consistent with this, I identify two groups of outperforming ESG-aware investors: dedicated ESG mutual funds and retail-institutional twin funds, which previous research identified as more sophisticated funds (Evans and Fahlenbrach 2012). Both groups exhibit less future ESG incident exposure and better fund performance than their peers.

In aggregate, my findings suggest that investors underreact to poor ESG practices because they pay not enough attention toward incidents. Apart from this explanation, taste could explain the underperformance of firms with poor ESG practices. A taste-based explanation relates the negative returns to unexpected increases in investors' preferences for sustainable stocks or customers' tastes for sustainable products (Pedersen, Fitzgibbons, and Pomorski 2019; Lubos, Stambaugh, and Taylor 2019). If sustainability concerns become more important, then controversial firms may face downward price pressure and declining sales.[8] However, this explanation is inconsistent with my findings that ESG incident rates predict more negative stock returns in firms where

[8] An important assumption of this explanation is that firms with high ESG incident rates are uniformly viewed as controversial by a sufficient fraction of investors, which is questionable given that these firms are associated with higher (and not lower) disagreement among conventional ESG ratings.

investor attention is lower and hence are less in the focus of the market. Similarly, ESG incident rates predict more negative profitability in firms with lower customer awareness. My results are therefore more consistent with mispricing rather than with changing tastes.

Non-causal explanations include reverse causality or omitted variables.[9] While I cannot completely rule out these explanations, I provide evidence against them. First, ESG incident news is associated with negative event returns, which are more robust against omitted variables. Second, high ESG incident rates can predict not only future incidents and lower profitability, but also negative stock returns, especially when investor attention is more limited. This suggests that the underperformance is related to a firm fundamental that is difficult to value—with poor ESG practices being the most likely contender given that one-fifth of the negative returns to high ESG incident rates materialize around *new* incident events. Third, insider trading is weakly positively related to high ESG incident rates, suggesting that insiders at firms with poor ESG practices expect a similar or better stock performance in the future. This is inconsistent with a reverse-causality explanation that insiders forecast poor stock performance and hence reduce ESG investments. Finally, my results are robust not only against many controls (such as differences in shareholder rights), but also against unobserved firm, industry, and time fixed effects.

This paper makes three contributions to the literature. The first is related to the debate on whether corporate sustainability impacts shareholder value. These studies either examine shareholder proposals (e.g., Dimson, Karakaş, and Li 2015; Flammer 2015), focus on specific ESG issues (e.g., Edmans 2011), or assess conventional ESG ratings (e.g., Ferrell, Liang, and Renneboog 2016). However, none of these papers look into the implications of a firm's history of ESG incidents. Some papers study the event returns of negative ESG news (e.g., Krüger 2015), but event studies alone allow no inference on the performance of firms with poor ESG practices because the cost to prevent an event may be higher than its damage. I contribute to this literature that firms that had high ESG incident rates are associated with higher ESG rating disagreement, more future incidents, lower profitability, lower risk-adjusted stock returns, and larger investor

[9] Reverse causality may arise when managers predict lower future stock performance and reduce spending on ESG practices as a result. Alternatively, the negative correlation between poor ESG practices and future stock returns might be driven by an unobserved confounding variable.

surprises. My findings update studies that find no underperformance of firms with low ESG ratings in recent years (e.g., Borgers et al. 2013).[10] Overall, my findings are consistent with Bénabou and Tirole (2010)'s hypothesis that poor ESG practices can be a form of short-termism—and simultaneously reduce long-term shareholder value and harm society.

My second contribution relates to a long literature on stock markets mispricing intangibles, such as corporate innovation (e.g., Chan, Lakonishok, and Sougiannis 2001). Several papers document that markets misprice particular types of *upside* ESG factors, such as employee satisfaction (e.g., Edmans 2011) or top management diversity (Manconi, Rizzo, and Spalt 2017). I add to this literature that stock markets tend to also misprice *downside* ESG factors by underreacting to the negative long-term value implications of poor ESG practices. Importantly, I also provide evidence on the friction that drives the underreaction: limited investor attention towards ESG incidents. Consistent with Bénabou and Tirole (2010), these findings provide evidence that poor ESG practices can result in excessive stock valuations and too optimistically forecasted earnings, which in turn may explain why some firms ignore ESG practices.

Finally, my third contribution is related to the literature investigating the benefits and costs of responsible investing.[11] While ESG factors may contain information about firm fundamentals and predict future returns, they may also induce upward price pressure on sustainable stocks due to excessive demand by responsible investors (Pedersen, Fitzgibbons, and Pomorski 2019; Lubos, Stambaugh, and Taylor 2019). I provide evidence that a firm's incident history contains material ESG information that can predict negative returns. A responsible investor may therefore improve her investment performance by screening out firms with high incident rates, assuming that a sufficient fraction of investors continues to neglect incident-based ESG information.

[10] To reconcile the different findings by these studies, I show that the net KLD score, used by Borgers et al. (2013), has no predictive power for future ESG incident news. The reason for this is that while firms with higher incident rates have more KLD weaknesses, they offset those with more strengths in other KLD criteria.

[11] The literature finds mixed evidence on the performance of ESG investing. While many studies find a zero effect (e.g., Bauer, Koedijk, and Otten 2005; Schröder 2007; Galema, Plantinga, and Scholtens 2008; Statman and Glushkov 2009) or a negative effect (e.g., Renneboog, Horst, and Zhang 2008; Hong and Kacperczyk 2009), some studies find evidence that ESG investing improves investment performance (e.g., Edmans 2011; Lins, Servaes, and Tamayo 2017; Edmans, Li, and Zhang 2017).

2. Data and Descriptive Statistics

2.1. ESG Incident Rate Measures

The dataset used in this study comes from RepRisk, a Zurich-based provider of ESG data. RepRisk collects ESG incident news (related to 28 different incidents) and links them to companies.[12] These incidents were chosen based on popular ESG-related international standards.[13] The dataset begins in January 2007 and covers publicly listed and private firms around the world. RepRisk includes every firm into the sample for which it found incident news.[14]

RepRisk uses a five-step process to identify and rate ESG incidents. First, RepRisk screens over 80,000 information sources on ESG news that are related to one of the 28 predefined incidents. These sources include print and online media (including local, national, and international media), NGOs, government agencies, think tanks, social media, and many other sources. Second, every identified incident is checked by a first-level RepRisk analyst who ensures that the incident is ESG-related, meets a severity threshold, and is not a duplicate of an older incident.[15] Third, the incident is analyzed by a second-level RepRisk analyst who considers the severity, reach, novelty, and intensity of the incident. Fourth, every incident undergoes a quality review by a RepRisk senior analyst who ensures that the second and third steps are processed according to RepRisk's rules. Fifth, the incident is quantified by the proprietary RepRisk Index, which is a weighted moving average of a firm's incidents.

The RepRisk Index (RRI) ranges from 0 to 100. According to RepRisk's documentation, a higher number denotes a higher ESG incident rate: an index value of 0–25 indicates a low incident

[12] Appendix A provides a detailed description of the 28 ESG incidents and Table IA1 of the Internet Appendix provides summary statistics. The most frequent incidents are violations of national legislation, impacts on communities, and impacts on ecosystems and landscapes.

[13] ESG standards that were considered include the World Bank Group Environmental, Health, and Safety Guidelines, the IFC Performance Standards, the Equator Principles, the OECD Guidelines for Multinational Enterprises, the ILO Conventions, and the 10 principles of the UN Global Compact.

[14] RepRisk's dataset therefore misses companies that never had any incident news. To rule out that this creates a bias when I compare firms with high ESG incident rates to control firms, I reestimate all panel regressions on the full CRSP-Compustat sample. I assign firms that are not included in the RepRisk sample a non-high incident rate. The untabulated results are qualitatively similar to the presented results.

[15] An old ESG incident is entered again in the database when a new development of an older incident appears, when the incident appears again in a more influential information source, *or* when the incident appears again for the same company in the same country after a six-week period.

rate, 26–50 a medium incident rate, 51–75 a high incident rate, and 76–100 a very high incident rate. The RRI of a firm increases whenever a firm experiences a new ESG incident. How much the index increases depends on the severity and novelty of the incident as well as on the reach and intensity of the news about the incident.[16] A larger increase in the RRI indicates that the firm had more or more severe ESG incidents in that month. Whenever a firm has no new incidents for at least two weeks, then the index decays within a few months to an RRI of 25 and within two years to an RRI of 0.[17]

I use four different ESG incident measures. *Incident score* is RepRisk's "Peak RRI," which is the two-year maximum value of the RRI capturing the long-term ESG incident history of a firm. *High incident score* is a dummy that takes the value of one when the *Incident score* is high according to RepRisk's documentation. *Number of incidents* is the logarithm of the total number of incident news over the past two years. While this measure is a more transparent long-term measure, it does not differentiate between major and minor incidents. *Short-term incident score* is RepRisk's "Current RRI," which reflects a firm's short-term exposure to incident news.

2.2. Descriptive Statistics of the US Sample

This study concentrates on stock markets in the United States but also looks at European stock markets. The US sample contains all publicly listed firms that are traded at the NYSE, the AMEX, or the NASDAQ for which RepRisk's ESG data is available.[18] I match the RepRisk dataset to CRSP, to Standard and Poor's Compustat, to IBES, to FactSet Ownership, to FactSet Insider, and to ESG ratings from KLD (which are now part of MSCI).

Figure 1 plots the evolution of the raw number of ESG incidents. The panels show that the number of incidents per year three-folded from 2010 to 2014, which likely is the result of an increased public awareness toward ESG. Panel A breaks down the number of incidents per ESG

[16] Table IA2 of the Internet Appendix provides a detailed description of these parameters.

[17] Technically, the RRI decays at a rate of 25 every two months *on levels above 25*, and it decays at a rate of 25 every 18 months *on levels equal to or below 25*.

[18] Following Edmans (2011), the sample includes firms with only American Depository Receipts (ADRs) in the United States because an investor constrained to US stock markets may invest in such firms. I find qualitatively similar results when I exclude firms with ADRs.

dimension and highlights that incidents related to multiple dimensions are the most frequent incidents,[19] followed by governance, social, and environmental incidents. Panel B shows the number of incidents per industry and ESG dimension. The three worst industries are manufacturing, finance, and mining. Panel C relates the number of incidents to a firm's lagged *Incident score*. About half of the incidents occur at firms that already had a high ESG incident rate.

Table 1 provides descriptive statistics for the full US sample. The sample is on a firm-month level because I obtained RepRisk's ESG data on a monthly level. Panel A reports pooled summary statistics of the *Incident score* in the main industry sectors based on the SIC1 codes. The table shows that there is a large cross-sectional variation within these industries. The 10th percentile of the variable is 0, its 50th percentile is around 25 (low incident score), and its 90th percentile is around 40 (medium incident score). Panel B shows that the sample has 239,122 firm-month observations belonging to 2,848 unique public firms between January 2007 and December 2017. The average firm in the RepRisk sample has a median market cap of about $2 billion and a median *Incident score* of 24.

Panel C of Table 1 show descriptive statistics for the 184 unique firms that have a *High incident score* at some point during the sample period. The main characteristic of these firms is that they are large, with a median market cap of $37 billion and book assets of $77 billion. The most common industries of these firms are petroleum and natural gas (17 unique firms), business services (17), retail (15), banking (14), trading (11), pharmaceutical products (11), and utilities (10). This indicates that firms with high incident scores are not clustered in a few industries.

2.3. Comparison Between ESG Incident Measures and Conventional ESG Ratings

The main difference between an ESG incident measure and conventional ESG ratings (e.g., KLD, MSCI IVA, Asset4) is that the former is based entirely on past ESG incident news, whereas the latter assess ESG practices by employing analysts that evaluate a predefined set of hundreds of ESG criteria. For example, previous papers often use ESG ratings from KLD, which is now part

[19] Incidents related to multiple dimensions also include miscellaneous incidents, which are not linked to any ESG dimension. Appendix B provides a description of these incidents.

of MSCI ESG Research. KLD assesses the 3,000 largest public firms in the US on more than 100 binary criteria related to ESG strengths and weaknesses.

Three arguments suggest that an incident measure is more suitable to assess the value implications of poor ESG practices than conventional ESG ratings. First, past outcomes are often the best possible predictor of future outcomes. This idea is applied in many contexts. For example, to assess the probability of future car accidents, insurance companies examine a driver's history of accidents and speeding violations. Similarly, the main determinant of credit scores is a person's history of credit payments. Second, identification of the value implications of poor ESG practices is easier with news-based incident events than with annually published ESG ratings from KLD. It also helps that RepRisk distinguishes major from minor ESG incidents. KLD, by contrast, gives each ESG criteria the same weight, which may result in the surprising outcome that a firm with no minority policy has a similar KLD score than a firm that paid substantial fines due to heavy pollution. Third, an incident-based measure should be more objective than ESG ratings as it is based on third-party news incidents, whereas conventional ESG ratings depend more on the underlying rating approach. Every rating provider uses a different methodology to assess companies and therefore, raters often disagree about the sustainability of a company (Gibson Brandon et al. 2019; Chatterji et al. 2016; Berg, Koelbel, and Rigobon 2019).

Table 2 contrasts incident-based measures with conventional ESG ratings. The first two columns explore the relation between firms' past incident rates and the disagreement among conventional ESG ratings. I regress the standard deviation and range of six different ESG ratings[20] on *High incident score* and controls. The results indicate that the disagreement among the six conventional ESG ratings is significantly higher when a firm had a high incident rate.

In the last three columns of the same table, I examine the relation between my incident measure and ESG ratings from KLD. Surprisingly, I find no evidence that high ESG incident rates are associated with a significantly lower net KLD score, defined as KLD strengths minus KLD concerns. The reason for this is that firms with high ESG incident rates tend to offset their KLD concerns

[20] I obtain the ESG disagreement measure from Gibson Brandon et al. (2019). It measures the disagreement among Thomson Reuters Asset 4, Sustainalytics, Inrate, Bloomberg, MSCI KLD, and MSCI IVA. The disagreement measure is available for S&P 500 firms between 2010 and 2017.

with KLD strengths as indicated by columns 4 and 5.

Taken together, these results suggest that firms with high ESG incident rates are associated with higher ESG rating disagreement. The disagreement may arise because companies tend to offset their ESG weaknesses with strengths in other ESG criteria. This behavior could reflect "greenwashing," i.e., pretending to be more sustainable than you are.

3. ESG Incident Rates and Future Firm Performance

This section examines whether firms' past ESG incident rates contain value-relevant information. I first analyze whether past incident rates can predict future incidents. I then study the relation between past ESG incident rates and future operating profits. As discussed previously, high ESG incident rates may either be consistent with a value-maximizing strategy that reduces costs by spending less on stakeholders' needs or be the outcome of managerial short-termism and have detrimental effects on long-term profits through a higher probability of new incidents. Finally, I estimate the event returns of ESG incident news to help with identification.

3.1. ESG Incident Rates and Future Incidents

To examine whether past ESG incident rates can predict future incidents, I regress the number of new ESG incidents in a year on lagged incident rates. The estimation is defined by

$$\textit{Number of new incidents}_{i,t} = b_0 + b_1 \textit{incident rate}_{i,t-1} + b_2 X_{i,t-1} + \eta_{j,t} + \epsilon_{i,t}, \tag{1}$$

where $\textit{Number of new incidents}_{i,t}$ is the logarithm of the total number of incident news of firm i in year t, $\textit{incident rate}_{i,t-1}$ is one of the four ESG incident rate measures (*High incident score*, *Incident score*, *Number of incidents*, or *Short-term incident score*) of firm i in year $t-1$, $X_{i,t-1}$ is a vector of control variables, $\eta_{j,t}$ are two-digit SIC industry-year dummies, and $\epsilon_{i,t}$ is the error term.[21] The control variables include the total book assets, book-to-market ratio, return on assets, dividends, cash holdings, leverage, capital expenditures, tangible assets, R&D expenditures, firm

[21] I use industry-year fixed effects to control for time-varying industry effects.

age, and S&P 500 membership. I double cluster the standard errors on the firm and year level. Appendix A provides definitions of all variables.

Panel A of Table 3 presents the results of this analysis. It shows that every ESG incident measure is positive and significant at the 1% level. In column 1, the coefficient on variable *High incident score* is 1.7424, which indicates that a firm has 4.7 times more incident news in the next year when it had a high ESG incident rate, even after controlling for firm characteristics and industry. In line with this, column 2 shows that a one-standard-deviation increase in the *Incident score* (17) results in 31% more incident news in the next year.[22]

Panel B of Table 3 explores the predictive power of conventional ESG ratings. I document that the disagreement among ESG ratings is a better predictor of future incidents than the net KLD score. In fact, the net KLD score lacks any predictive power, which is consistent with Yang (2020), who finds no evidence that ESG ratings from MSCI IVA can predict future corporate misbehavior. The last two columns reveal that the net KLD score fails to predict future incidents because its components, KLD strengths and KLD concerns, offset each other.

These results suggest that past incident rates strongly predict the realization of new incidents, which emphasizes that incident-based ESG measures are a good proxy for poor ESG practices. Conventional ESG ratings, by contrast, show less predictive power for future incident news.

3.2. ESG Incident Rates and Future Profitability

I next explore the effect of ESG incident rates on future profitability by estimating the following model by a pooled OLS regression

$$\textit{Return on assets}_{i,t} = c_0 + c_1 \textit{incident rate}_{i,t-1} + c_2 X_{i,t-1} + \eta_{j,t} + \epsilon_{i,t}, \tag{2}$$

where $\textit{Return on assets}_{i,t}$ is the return on assets (ROA) of firm i in fiscal year t, variable $\textit{incident rate}_{i,t-1}$ is one of the four ESG incident rate measures of firm i in fiscal year $t-1$,

[22] I conduct several robustness tests in terms of model specification. I find that the results are robust to firm fixed effects (see Table IA3 of the Internet Appendix), although the incident-based measures are very persistent across time. Furthermore, in unreported tests, I find similar results when using a Fama and MacBeth (1973) regression or a Poisson model instead of the OLS model.

$X_{i,t-1}$ is a vector of control variables, $\eta_{j,t}$ are two-digit SIC industry-year dummies, and $\epsilon_{i,t}$ is the error term. I calculate ROA as the ratio of net income over total book assets. Following Gompers, Ishii, and Metrick (2003), I winsorize ROA at the 5% and 95% levels. The control variables are the total book assets, book-to-market ratio, leverage, capital expenditures, tangible assets, R&D expenditures, firm age, and S&P 500 membership.

Table 4 shows that the coefficients on the ESG incident measures are negative and statistically significant at the 1% level in all models. Column 1, for example, documents that firms with a *High incident score* have an ROA that is 2.4% percentage points lower in the next year. Column 2 finds that a one-standard-deviation increase in the *Incident score* (17) is associated with a 6.4% lower standard deviation in next year's ROA. In Tables IA4 and IA5 of the Internet Appendix, I document that the results are robust to firm fixed effects in three of the four specifications and to alternative measures of operating performance.[23]

The findings of this and the previous subsections suggest that firms' past ESG incident rates predict significantly more future ESG incidents and weaker operating profitability. This is consistent with Bénabou and Tirole (2010)'s hypothesis that poor ESG practices negatively impact long-term firm performance.

3.3. Event Returns of ESG Incident News

The relation between ESG incident rates and firm performance is endogenous. To help with identification, I assess the event returns of ESG incident news. If poor ESG practices negatively impact firm performance, then shareholders should respond negatively to ESG incident news under the assumption of rational markets.

I conduct an event study following the methodology explained by MacKinlay (1997). First, I identify the events. Every event is a positive change in a firm's *Short-term incident score*, which indicates that a firm had one or more ESG incidents in that month.[24] To be considered an event,

[23] I use three alternative operating performance measures: return on equity (ROE) is the ratio of net income over the sum of common equity and deferred taxes, one-year sales growth (Growth) is the ratio of sales over sales from the previous fiscal year, and net profit margin (NPM) is the ratio of net income over sales.

[24] I study positive changes in the *Short-term incident score* instead of the individual ESG incident news to better relate the results to those of the ESG incident measures in the other sections.

the positive change in the score has to be higher than a certain threshold. I do this to exclude minor events. Second, for every event, I estimate the firm's normal stock returns in a pre-event window ranging from 299 trading days to 50 trading days prior to the event. The coefficients of the pre-event regression are estimated using either the market model, the four-factor Carhart (1997) model, or the corresponding 48-industry portfolio from Fama and French (1997). Third, I use the saved coefficients from the pre-event regression to calculate the event's cumulative abnormal return (CAR) during the event window covering either 21 or 31 trading days. Fourth, I calculate a t-statistic for the CARs by solving the formula

$$t(CAR) = \frac{\frac{1}{N}\sum_{n=1}^{N} CAR_n}{\sqrt{\frac{1}{N^2}\sum_{n=1}^{N} \text{Var}(CAR_n)}}, \tag{3}$$

where N is the number of events and $\text{Var}(CAR)$ is the variance of the residuals of the pre-event regression multiplied by the number of trading days in the event window.

Table 5 shows that the events are associated with negative CARs. All CARs are statistically significant at the 1% level. For example, an increase in the *Short-term incident score* of higher than 10 points has a significant negative CAR (estimated with the market model over a centered window of 21 trading days) of 0.51%. This amounts to a shareholder value loss of about $49.0 million per event, as a firm in the RepRisk data sample has a mean market capitalization of $9.6 billion.[25] If the *Short-term incident score* increases by at least 30 points (indicating more severe ESG incidents), then the shareholder value loss is about $202.4 million per event.

These results compare to the results of Krüger (2015), who investigates the short-term value effects of severe environmental and social incidents from KLD, such as product safety issues and fraudulent practices. He finds that these events are associated with a mean 11-day (21-day) CAR of −0.88% (−1.31%). In his sample, the negative CARs amount to an average shareholder value loss of $229.5 million ($341.7 million) per event.

The negative event returns suggest that ESG incidents destroy firm value. Given that event studies are more robust against non-causal explanations, this result supports the interpretation of

[25] I show the mean market capitalization and not the median because larger firms have more ESG incidents.

my earlier findings that high incident rates are associated with a lower firm performance.[26]

4. ESG Incident Rates and Future Stock Returns

ESG incident rates may predict not only lower future profits, but also lower stock returns if a substantial fraction of investors underweight material ESG information in their investment decisions (Pedersen, Fitzgibbons, and Pomorski 2019). As discussed in the introduction, this hypothesis is motivated by the uncertainty of whether ESG is material, the difficulty of quantifying the long-term value implications of ESG practices, the high disagreement among ESG rating providers (e.g., Chatterji et al. 2016), evidence that US investors underweight ESG information (Amel-Zadeh and Serafeim 2017; Gibson Brandon et al. 2020), and the tendency of capital markets to misprice intangible assets (e.g., Chan, Lakonishok, and Sougiannis 2001).

Considering a market underreaction is important because it would contribute to myopic behavior at the company level (Stein 1988; Stein 1989; Edmans 2009). It may therefore explain why firms underinvest in ESG practices in the first place. If stock markets do not fully incorporate the negative value implications of poor ESG practices, then corporate managers will find it easier to boost stock prices by ignoring ESG practices.

4.1. Portfolio-Level Regressions

This subsection investigates the returns of US portfolios with different levels of ESG incident rates. I sort the firms into three portfolios based on their *Incident score*. I choose the incident score as the sorting variable because it captures the long-term history of a firm's past ESG incidents and takes into account whether an incident has a higher severity, has a higher reach, or is more novel. Following RepRisk's classification, I create portfolios with low (0–25), medium (26–50), and high (51–100) incident scores.[27] Given that the variable requires a history of two years, I form the three

[26] Note that event studies alone allow no inference on how incident rates impact firm performance as the costs to prevent an incident may be higher than its damage. It is therefore important to interpret the results of the event study together with my earlier findings on incident rates and operating profits.

[27] Note that RepRisk also distinguishes between firms with high (51–75) and very high (76–100) incident scores. I merge both categories because almost no firm has an incident score of equal or higher than 76.

portfolios for the first time in January 2009 and rebalance the portfolios annually. This procedure results in a time series of monthly portfolio returns from January 2009 to December 2017.[28]

To ensure different stock returns are not the result of different risk exposures, I control for the four risk factors of Carhart (1997). The abnormal risk-adjusted returns of the portfolio are therefore estimated by

$$R_t - Rf_t = \alpha + \beta_1 MKT_t + \beta_2 HML_t + \beta_3 SMB_t + \beta_4 MOM_t + \epsilon_t, \tag{4}$$

where α is the abnormal risk-adjusted return, R_t is the portfolio return in month t, Rf_t is the risk-free return from Ibbotson Associates, MKT_t, SMB_t, HML_t, and MOM_t are the returns on the market, size, value, and momentum factors, respectively, and ϵ_t is the error term. I obtain the risk-free rate and the four factors from Kenneth French's homepage.[29]

While the Carhart (1997) factor model is common in the finance literature, it may estimate biased returns for the portfolio with high incident scores. The concern is that firms with high incident scores are larger and more globally oriented firms. These firms may therefore have stock returns that are correlated with international stock markets. US-based asset pricing models might thus be inappropriate to capture all the systematic risk of these multinational firms (Karolyi and Stulz 2003). Rather than choosing a local or global asset pricing model a priori, I follow Bartram, Brown, and Stulz (2012), and extend the regression model stated in equation 4 by a full set of world factors ($WMKT$, $WSMB$, $WHML$, and $WMOM$) and show the results for robustness.

Table 6 presents the risk-adjusted returns of the portfolios. Panel A shows the estimates for the four-factor US model. Firms with low or medium ESG incident scores are associated with insignificant alphas, whereas firms with high ESG incident scores have significant negative alphas. Columns 3 and 6 of Panel A show that a portfolio with high ESG incident scores has an equal-weighted monthly alpha of -0.58% and a value-weighted monthly alpha of -0.25%, which are significant at the 1% and 5% levels (with t-statistics of -3.4 and -2.5), respectively. Panel B

[28] If a firm delists, I account for delisting returns by using the delisting returns when the delisting payment date is prior to the end of the month. If the delisting payment date is after the end of the month, I aggregate the delisting return and the monthly return when both are available.

[29] See `http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/`.

shows the estimates for the eight-factor world model. Columns 3 and 6 reveal that the negative alpha of the equal-weighted portfolio with high ESG incident scores is likely overstated. When using the eight-factor world model to estimate the abnormal returns, the monthly alpha of the equal-weighted portfolio with high ESG incident rates shrinks to −0.33% (−3.96% annually), approximately half the size of the four-factor alpha. Nevertheless, the negative alpha remains significant at the 1% level. The value-weighted portfolio with high ESG incident scores has a monthly eight-factor alpha of −0.26% (−3.12% annually), which is roughly similar to the alpha estimated with the four-factor US model. These results provide evidence that a US portfolio with high ESG incident scores underperforms its benchmarks by about 3.5% per year.

Table IA6 of the Internet Appendix provides information about the portfolios such as their number of firms and total market capitalizations. The portfolio with high ESG incident scores contains 65 firms and has a market capitalization of $5.3 trillion (which amounts to about one-fifth of the total US stock market) on average. An annual underperformance of 3.5% therefore translates into a yearly shareholder value loss of about $185.5 billion.

Table 7 runs several tests to examine the robustness of the results. My first concern is that the portfolio with high ESG incident scores has a negative alpha because of some underperforming industries. I investigate this problem by creating an industry-adjusted portfolio, using the 48 industry portfolios from Fama and French (1997).[30] The first row of Panel A reveals that the alphas range between −1.56% and −5.16% annually and are statistically significant in three of the four regressions, with the value-weighted portfolio being less significant.

I next investigate an industry-matched long/short portfolio to further rule out industry explanations. I form a portfolio that is long in firms with high ESG incident scores and short in three comparable firms with low incident scores. The matching criteria are the same two-digit SIC industry, similar total book assets, and similar book-to-market ratios (based on the Mahalanobis distance criterion).[31] The second row of Panel A shows that the equal-weighted alphas range

[30] For each stock in the portfolio, I first deduct the returns of the corresponding value-weighted industry portfolio from the stock's raw returns. I then calculate the risk-adjusted stock returns of the industry-matched portfolio.

[31] The results of the long/short strategy are similar when using propensity score matching and when varying the ratio of target firms to control firms between 1:1, 1:3, and 1:5.

between −4.32% and −6.60% annually, whereas the value-weighted alphas are between −3.24% and −4.68% annually. They are statistically significant in three of the four regressions.

The last two rows of Panel A examine outliers and risk-adjustment using weekly factors. The third row winsorizes the stock returns at the 1% and 99% levels before creating the portfolio. It reveals that the winsorized portfolio exhibits significantly negative alphas that range between −2.64% and −6.60% annually. The fourth row indicates that firms with high incident scores have weekly alphas that are comparable in size to their monthly alphas.

In the Internet Appendix, I test for misspecified factor models by estimating other asset pricing models. The first other model is one that consists of the four risk factors from Carhart (1997), the betting-against-beta factor (BAB) from Frazzini and Pedersen (2014), and the liquidity factor (LIQ) from Pástor and Stambaugh (2003).[32] The second other asset pricing model is the five-factor Fama and French (2015) model. Table IA7 of the Internet Appendix shows that the alphas of the two other models are slightly less negative compared to the baseline results. Nevertheless, the negative alphas remain statistically significant at the 5% level in all specifications.

4.2. Out-Of-Sample Test Using European Firms

I next conduct an out-of-sample test with European stock data. I create the European portfolio with high ESG incident rates based on all European firms[33] with a high incident score, similar to the US portfolio. I create the portfolio for the first time in January 2009 and rebalance it every year. This procedure results in a time series of monthly portfolio returns from January 2009 to December 2017. The portfolio contains 47 firms on average.

To calculate the risk-adjusted returns, I regress the portfolio returns on four European risk factors (market, size, value, and momentum), which come from Kenneth French's homepage. For

[32] Including the betting-against-beta factor is important because the equal-weighted portfolio with high ESG incident rates consists of high-beta stocks, as indicated by a market beta of about 1.2 (see the third column of Panel A of Table 6). These high-beta stocks may explain the negative alpha of firms with high ESG incident rates because high-beta stocks underperform their benchmarks (Frazzini and Pedersen 2014).

[33] The European sample contains every firm that is incorporated and listed in one of these countries: Austria, Belgium, Switzerland, Germany, Denmark, Spain, Finland, France, Great Britain, Greece, Ireland, Italy, Netherlands, Norway, Portugal, and Sweden. Stock returns and market capitalizations of the European stocks are obtained from Datastream and are converted into US dollars.

robustness, I regress the portfolio returns also on an eight-factor world model. The eight-factor model consists of four European risk factors and four world risk factors. Panel A of Table 7 presents the equal-weighted and value-weighted alphas of the European portfolio. The alphas range between 0.48% and −3.24% annually, indicating that European firms with high ESG incident rates exhibit negative risk-adjusted stock returns. The negative alphas are statistically significant when the portfolio is value-weighted, with t-statistics ranging between −1.8 and −3.4.

As the portfolio contains only 47 firms on average, I control for outliers. Panel B of Table 7 winsorizes the stock returns at the 1% and 99% levels before creating the portfolio and running the regressions. The winsorized portfolio is associated with large negative alphas ranging between −1.32% and −3.36% annually. The negative alphas are significant at the 10% level with the equal-weighted portfolio (only with the eight-factor model) and at the 5% and 1% levels with the value-weighted portfolio (both models). These results indicate that a European portfolio with high ESG incident rates generates negative risk-adjusted returns, which are smaller than the negative returns of the corresponding US portfolio. This out-of-sample test shows that the negative relationship between ESG incident rates and long-run stock returns holds not only in the United States, but also in Europe.

4.3. Stock-Level Regressions

This section estimates stock-level regressions to address concerns that firms with high ESG incident rates underperform because of an omitted variable. The panel regression is specified by

$$\textit{Stock return}_{i,t} = a_0 + a_1 \textit{Incident rate}_{i,t-2} + a_2 X_{i,t-2} + \theta_t + \epsilon_{i,t}, \tag{5}$$

where $\textit{Stock return}_{i,t}$ is the raw return on stock i in month t, $\textit{Incident rate}_{i,t-2}$ is one of the four ESG incident measures of firm i at the end of month $t-2$, $X_{i,t-2}$ is a vector of control variables of firm i known at the end of month $t-2$, θ_t are month dummies, and $\epsilon_{i,t}$ is the error term. The stock returns $R_{i,t}$ are winsorized at the 1% and 99% levels to account for outliers. I double cluster

the standard errors on the firm and time level.[34]

Following Brennan, Chordia, and Subrahmanyam (1998) and Edmans (2011), the vector of control variables includes market capitalization, book-to-market, dividend yield, past stock returns, stock trading volume, and stock price. I also control for idiosyncratic volatility, investment, and profitability because these variables can predict stock returns (Ang et al. 2009; Aharoni, Grundy, and Zeng 2013; Novy-Marx 2013). Appendix A provides definitions for all variables. Variables that require accounting data are calculated each July based on accounting data as of the last fiscal year and are held constant through the following June. All independent variables used to predict the stock returns of month t are known at the end of month $t-2$.

Table 8 presents the results of the panel regressions. Column 1 shows that the variable *High incident score* has a coefficient of -0.00323. This indicates that firms with high ESG incident rates have 3.9% lower stock returns per year, which is in size comparable to the negative alpha found in the portfolio analyses. The coefficient is statistically significant at the 10% level (with a t-statistic of -1.9).[35] Column 2 shows a negative correlation between *Incident score* and subsequent stock returns. The correlation is statistically significant at the 1% level. It is also economically significant, as a one-standard-deviation increase in the *Incident score* (17) results in 1.59% lower stock returns per year. Column 3 also finds a negative association between *Number of incidents* and future stock returns. In column 4, I investigate the *Short-term incident score*. This variable gives me the advantage of not losing the first two years of the sample period that I require when I calculate the more long-term incident measures. Therefore, the sample period in column 4 is from March 2007 to December 2017. The *Short-term incident score* is also significantly negatively loaded.

To rule out industry correlations explaining the results, I repeat the analysis with industry-adjusted stock returns. Specifically, from each stock return, I deduct the return of the corresponding

[34] I do not use the Fama and MacBeth (1973) approach because it is robust only against time but not against firm effects (Petersen 2009). Instead, I estimate a pooled OLS panel regression with time dummies and double-clustered standard errors, which results in very conservative standard errors. For the sake of completeness, I show the Fama and MacBeth (1973) regression in Table IA8 of the Internet Appendix.

[35] The large standard errors result from noisy stock returns, a small sample size (eight years), and substantial multicollinearity between the independent variables. Gompers, Ishii, and Metrick (2003) suffer from similar problems when they study the effect of corporate governance on stock returns (see Table XIII of their study).

industry. The industry returns are the returns of the value-weighted 48-industry portfolios from Fama and French (1997). For brevity, I present the results in Table IA9 of the Internet Appendix. The results on most incident measures are roughly similar to the results shown in Table 8, but the coefficient on variable *High incident score* is lower. With a coefficient of −0.00213, firms with high ESG incident rates have 2.56% lower stock returns per year. The coefficient is slightly below the significance hurdle of 10%, with a t-statistic of −1.6. The remaining incident measures are significant at the 5% and 1% levels, though.

In the Internet Appendix, I further test whether weak corporate governance can explain the negative correlation between ESG incident rates and stock returns. Earlier studies find that weak shareholder rights predict negative returns (Gompers, Ishii, and Metrick 2003). I measure corporate governance based on a dummy indicating whether the CEO is also the Chair of the board and on the entrenchment index of Bebchuk, Cohen, and Ferrell (2009). Table IA10 of the Internet Appendix presents the results. As the corporate governance variables are available only for a small subsample, I also present baseline results on the restricted sample. The table reveals that including the governance variables into the regressions does not change the coefficients of the ESG incident rate measures, suggesting that weaker shareholder rights do not drive the underperformance of firms with high ESG incident rates.

4.4. Disentangling ESG Dimensions

I next examine whether the results on the aggregated ESG incident rate are driven by either environmental, social, or governance incidents. Two difficulties emerge when differentiating between the three dimensions. First, about one-third of the incident news in the RepRisk database are linked to either more than one dimension or are not linked to any dimension (the miscellaneous incidents). Second, the median firm with a high incident score has 40% exposure to social incidents, 33% exposure to governance incidents, and 15% exposure to environmental incidents. This shows that firms with high incident rates experience incidents in all ESG dimensions.

I disentangle the three dimensions by creating an interaction between the ESG incident measures and dummies that captures whether a company has more than 50% exposure to one particular

ESG dimension. Table IA11 of the Internet Appendix regresses raw stock returns on lagged ESG incident measure, on the interactions, and on controls. Looking at the three interactions with *High incident score* in Panel A, I find that the incident dummy is significantly more negative when a firm has more than 50% exposure to environmental incidents, while it is significantly less negative with 50% exposure to governance incidents. In the remaining panels, the only significant interaction is the environmental interaction. More importantly, I observe that the aggregated ESG incident measures remain significantly negatively loaded in most specifications even after controlling for the three ESG dimensions.

I therefore conclude that the aggregated level of the ESG incident rate matters more for return prediction than individual exposure to one of three ESG dimensions.

5. Risk Versus Investor Surprise Explanations

The findings presented thus far have shown that firms' past ESG incident rates predict future incidents, weaker profits, and lower risk-adjusted stock returns. The two main competing explanations for negative stock returns are differences in risk or investor surprises.

A risk-based explanation attributes the negative returns to lower systematic risks. Firms with high ESG incident rates may bear *lower* systematic risks than peers and hence show lower returns. While my findings are robust to common risk factors, it is possible that these firms are associated with lower risks that are not captured by traditional factor models. Alternatively, an investor surprise explanation implies that stock markets underreact to the adverse effects that poor ESG practices have on long-term firm value (e.g., reputational damage). Poor ESG practices will lead to lower stock returns once elevated ESG business risks manifest in tangible outcomes, such as lower earnings or new ESG incident news.

5.1. ESG Incident Rates and Analysts Earnings Forecasts

To examine an investor surprise explanation, one would ideally compare investors' expectations to actual firm outcomes. However, as investors' expectations are not observable, I resort to analysts' earnings forecasts, which capture the views of informed market participants. If stock markets

underestimate the negative effects of high ESG incident rates, then there should be negative surprises when lower earnings are announced.

Following Core, Guay, and Rusticus (2006) and Giroud and Mueller (2011), I investigate analyst earnings surprises by estimating the pooled OLS regression

$$\textit{Forecast error}_{i,t} = d_0 + d_1 \textit{Incident rate}_{i,t-1} + d_2 X_{i,t-1} + \eta_{j,t} + \epsilon_{i,t}, \tag{6}$$

where $\textit{Forecast error}_{i,t}$ is the one-year earnings surprise of firm i at fiscal year t, $\textit{Incident rate}_{i,t-1}$ is one of the four ESG incident rates measured at the end of fiscal year $t-1$, $X_{i,t-1}$ is a vector of control variables, $\eta_{j,t}$ are two-digit SIC industry-year dummies, and $\epsilon_{i,t}$ is the error term. The one-year earnings surprise is calculated as the difference between the actual earnings per share for fiscal year t and the median IBES analyst forecast, scaled by the stock price at the end of fiscal year t. Following the literature, I remove all observations that have a forecast error of larger than 10% of the stock price.[36] The consensus forecast for the fiscal year-end is estimated eight months earlier. The ESG incident rates are measured 12 months prior to the end of the fiscal year—that is, four months before the analysts make their estimates. This ensures that analysts have enough time to gain information about a firm's ESG incident rate before they estimate the earnings. The control variables are the logarithm of the market capitalization and the logarithm of the book-to-market ratio.

Panel A of Table 9 presents the results. Column 1 shows that the coefficient on variable *High incident score* is negative and significant at the 1% level, indicating that analysts overestimate the earnings of firms with high ESG incident rates. The remaining columns reveal that the other incident measures are also significantly negative.[37]

Panel B repeats the test on an analyst level. This allows me to control for industry-year and analyst-year fixed effects to rule out explanations based on industry or analyst characteristics even when they are time varying. The dependent variable in these tests is the difference between

[36] For example, see Lim (2001), Teoh and Wong (2002), or Giroud and Mueller (2011).

[37] The results are similar when I restrict the analysis to firms with a minimum of five analysts or when I use mean earnings surprises instead of median earnings surprises.

actual earnings and an analyst's forecast. The results are slightly weaker but remain significantly negative. This provides evidence that the same analyst at the same point in time issues too optimistic forecasts on firms with high incident rates.

In the Internet Appendix, I explore the horizon of the analysts' forecast errors. If the forecast error is related to long-term ESG information, then their long-horizon earnings forecasts should be more biased than their short-horizon forecasts. I test this prediction by exploiting the fact that analysts make multiple earnings forecasts (for different future fiscal years) at the same point in time. This test design ensures that their short- and long-term forecasts are based on the same information set. Any differences in the two forecasts thus arise from how much weight analysts place on the short- versus long-term outlook. Table IA13 of the Internet Appendix contrasts the earnings surprises of fiscal year $t+1$ with the earnings surprises of fiscal year $t+2$. The regressions are similar to the test described by equation 6. I restrict the analysis to observations where both forecasts (for year $t+1$ and year $t+2$) are available. The results suggest that analysts suffer from a short-term bias when processing ESG information.

The negative sell-side earnings surprises suggest that the negative returns to ESG incident rates represent market underreaction rather than differences in risks.

5.2. ESG Incident Rates and Investors' Reactions on Information-Release Days

If the stock markets indeed underreact to ESG incident rates, then the negative returns should be concentrated around corporate news that signal a lower firm performance than expected. I test this implication by studying quarterly earnings announcements and subsequent ESG incident news of firms with high ESG incident rates.

I start with earnings announcements events. For each quarterly earnings announcement, I calculate the three-day (t_{-1}, t_0, t_{+1}) cumulative abnormal return in excess of a market model.[38] Following Edmans (2011), the market model is estimated on a pre-event window ranging from 300 trading days to 46 trading days prior to the event. To account for outliers, I winsorize the

[38] In untabulated robustness checks, I find similar results when using a five-day event window instead of a three-day event window or when using the Carhart (1997) four-factor model instead of the market model to estimate the normal returns during the pre-event window.

CARs at the 1% and 99% levels. I regress the estimated abnormal returns on an ESG incident measure, on firm controls, and on year dummies. All independent variables are measured 12 months before the quarterly earnings announcement. The control variables are the logarithm of the market capitalization and the logarithm of the book-to-market ratio.

Panel A of Table 10 shows the results of this analysis. Column 1 shows that the coefficient on variable *High incident score* is negative and significant at the 5% level, indicating that firms with high ESG incident rates have lower earnings announcement returns than their peers. The abnormal announcement returns amount to −0.34% per quarter or −1.4% per year. While the remaining variables are mostly negatively correlated with abnormal earnings announcement returns, they are not statistically significant, which could be the result of noisy estimated announcement returns.

I next examine subsequent ESG incident news. If investors underestimate the probability of new ESG incidents, then the materialization of new ESG incidents should lead to negative event returns. I investigate this hypothesis by studying the event returns of incident news that happen at firms that already had high past incident rates. To reduce the impact of outliers in the smaller sample, I delete events with very large CARs (at the 1% and 99% percentiles).[39]

Panel B of Table 10 presents the results of the event study. The results show that ESG incidents from firms with high ESG incident rates are associated with negative CARs, which range between −0.31% and −0.67% per event. The negative CARs are statistically significant in four of the six event studies. Given that a firm with high past ESG incident rates has on average 1.4 *new* incidents per year and the average event return is −0.49% (third row), this channel accounts for stock returns of approximately −0.7% per year.

Taken together, the negative returns to quarterly earnings announcement (−1.4% per year) and to new ESG incidents (−0.7% per year) can explain about three-fifths of the negative returns of firms with high ESG incident rates. These results are consistent with a market underreaction.

[39] In this event study, I investigate primarily small increases in the *Short-term incident score*. The reason for this is that RepRisk takes a firm's history of ESG incidents into account when rating new incidents. Firms with high ESG incident rates are less sensitive to new incidents. As a result, even small increases indicate severe incidents.

5.3. ESG Incident Rates and Limited Investor Attention

Analyst and investor surprises suggest a bias, but the question as to *why* markets underreact remains. In this section, I conduct cross-sectional tests to explore whether limited investor attention can explain the underreaction. A limited attention explanation becomes more compelling if it can be related to a particular group of investors that are ex-ante more likely to underreact (Hirshleifer, Hsu, and Li 2018). Previous research has emphasized the role of investor horizon in processing ESG information by showing that short-term institutional investors have lower ESG preferences (Starks, Venkat, and Zhu 2017; Gibson Brandon, Krueger, and Mitali 2020).

Guided by this research, I examine whether the return predictive power of past ESG incident rates is more pronounced in firms with higher short-term ownership. I test this by regressing stock returns on lagged ESG incident measures within subsamples (see equation 5). I split the subsamples based on the short-term ownership median, which I recalculate every month to ensure balanced subsamples.[40] Panel A of Table 11 finds that ESG incident rates are associated with more negative future returns in firms with higher short-term ownership. Economically, firms with a *High incident score* have -11.1% annualized lower returns in the next month when short-term ownership is high versus -0.9% annualized lower returns when short-term ownership is low. This subsample test suggests that the stock underreaction is related to short-term investors.

Limited attention models also predict that the stock underreaction is more pronounced in firms with larger uncertainty about future cash flows (Hirshleifer, Hsu, and Li 2018). Intuitively, if a firm is more opaque, investors may be less likely to decipher the value implications of firm characteristics that are ex-ante more difficult to value. I test this implication by measuring valuation uncertainty based on analyst forecast dispersion (Hirshleifer, Hsu, and Li 2018). Consistent with limited attention theory, Panel B of Table 11 finds that the return predictive power of ESG incident rates is stronger in firms with higher analyst forecast dispersion.

Another implication of limited attention models is that the stock underreaction increases with

[40] Following Gaspar, Massa, and Matos (2005), I calculate short- and long-term ownership in two steps. I first classify institutional investors into short-term and long-term investors based on whether they are in the top or bottom tercile of the portfolio churn ratio calculated over the last four quarters. I then create the ownership variables by dividing the shares of the investor group (short- or long-term investors) by the firm's total outstanding shares.

lower overall investor attention. Following Hirshleifer, Hsu, and Li (2013), I proxy overall investor attention by analyst coverage. In line with this prediction, Panel C of Table 11 finds that the returns to ESG incident rates are more negative in firms with lower analyst coverage.

Taken together, the three tests suggest that the lower abnormal returns associated with ESG incident rates are more pronounced when investor attention is more limited, consistent with behavioral market inefficiencies.

5.4. ESG Incident Rates and ESG-aware Funds

If the stock market underreacts to negative ESG information on average, investors that do incorporate the neglected information into their investment decisions should outperform their peers (Pedersen, Fitzgibbons, and Pomorski 2019). This section utilizes fund data from Morningstar and fund holdings data from CRSP to explore this implication. I use fund holding data instead of institutional holding data to allow for more precise measures of fund performance.

I explore two types of mutual funds that are more likely to pay attention towards ESG incidents. The first group is dedicated ESG mutual funds, which incorporate ESG information and impact companies on sustainability issues. The second group is retail-institutional twin mutual funds, which are funds with the same manager and same performance sold to both retail and institutional clients. Evans and Fahlenbrach (2012) provide evidence that these twin funds exhibit better fund performance, more managerial effort, lower expenses, and less agency problems from greater monitoring. Due their sophisticated nature, these twin funds may be more likely to incorporate ESG information that is material but difficult to quantify.

I first examine whether these mutual fund types hold companies that are less likely to suffer from ESG incidents. I construct three holdings-based measures of ESG incident exposure by calculating the weighted average incident exposure of a fund's equity positions. The measures are forward looking, meaning that I multiply the weights at the beginning of a quarter with the stocks' incident rates at the end of a quarter. I regress these fund measures on dummies for ESG funds and twin non-ESG funds, control variables, and style-month fixed effects. Panel A of Table 12 shows that both ESG funds and twin non-ESG funds have significantly lower ESG

incident exposure compared to conventional funds. The effect is larger for ESG funds than for twin non-ESG funds. These findings suggest that both fund types pay more attention towards ESG incident information than their peers.

I then explore whether these mutual funds exhibit a better fund performance. I measure fund performance based on fund raw returns, benchmark-adjusted returns, and four-factor abnormal fund returns. I calculate the four-factor abnormal returns by taking the difference between a fund's returns and its factor exposure, estimated over the previous 36 months. Panel B of Table 12 illustrates that ESG and twin non-ESG funds have a significantly better fund performance than conventional funds.

This evidence suggests that ESG-aware mutual funds profit from the market inefficiency associated with incident-based ESG information.

6. Additional Alternative Explanations

While the evidence presented thus far points toward limited investor attention rather than differences in risk, there are also additional alternative explanations. In this section, I discuss five other explanations:

A. The overvaluation is the result of limits to arbitrage—i.e., that investors cannot short stocks with high ESG incident rates because it is not possible to borrow their stocks.

B. An unexpected increase in non-pecuniary investor demand for sustainable stocks leads to lower stock returns at firms with high ESG incident rates.

C. An unexpected increase in customer demand for sustainable products leads to lower profits and returns at firms with high ESG incident rates.

D. The relation between poor ESG incident rates and lower stock returns is driven by reverse causality, meaning that managers who predict a bad future stock performance implement lower ESG standards.

E. The lower returns are due to an omitted variable correlated with ESG incident rates.

Hypothesis A investigates whether the overvaluation of firms with high ESG incident rates can be attributed to limits to arbitrage. Limits to arbitrage could arise if overvalued stocks cannot be borrowed. I test this by analyzing the returns of a portfolio with high ESG incident rates that is likely not subject to short-selling constraints. This portfolio includes only firms with high ESG incident rates that have an institutional ownership of higher than 25%, a stock price of higher than \$5, and a market capitalization of at least \$1 billion. I choose these rules based on the findings by D'Avolio (2002), who describes the market for borrowing and lending US equities. He finds that most stocks can be borrowed, except those from firms with low market capitalization, low institutional ownership, and stock prices under \$5. Table IA12 of the Internet Appendix shows that this portfolio is associated with negative abnormal returns ranging between -2.16% and -3.72% per year. These results are close to the baseline results presented in Table 6, suggesting that limits to arbitrage cannot explain the lower returns to high ESG incident rates.

Hypothesis B states that the stock underperformance could be driven by an unexpected shift in non-pecuniary investor demand toward sustainable stocks over the sample period (Pedersen, Fitzgibbons, and Pomorski 2019; Lubos, Stambaugh, and Taylor 2019). If a sufficient fraction of investors unexpectedly implement a uniform non-financial preference against "controversial" firms, then these firms will underperform relative to their benchmarks. However, my findings are inconsistent with a non-pecuniary channel. First, given that firms with high ESG incident rates are associated with higher (and not lower) ESG rating disagreement, it is unlikely that a sufficient fraction of investors reach a uniform non-financial preference against these firms. Second, while an investor taste-based explanation predicts negative stock returns, it cannot explain my other findings that high ESG incident rates are associated with lower operating profits and negative earnings surprises. In fact, about two-fifths of the negative returns to high ESG incident rates arise from negative earnings announcement returns, which points toward a financial rather than a non-financial channel. Finally, the returns to ESG incident rates are more negative when limited attention is more likely, which is difficult to reconcile with an investor taste-based channel. A taste-based explanation implies more negative returns when investor attention is higher.

Hypothesis C explores a customer taste-based explanation involving unexpected positive shifts

in customer's ESG preferences over the sample period (Lubos, Stambaugh, and Taylor 2019). If customers unexpectedly demand goods of more sustainable companies, then controversial firms will experience lower profits and lower stock returns. To test for this channel, I explore the relation between ESG incident rates and future operating profits within subsamples of low and high customer awareness. A customer taste-based explanation would predict a more negative profit relation when customer awareness is high. Using advertising intensity as a proxy for customer awareness (Servaes and Tamayo 2013), I find that ESG incident rates predict more negative profits in firms with lower customer awareness (see Table IA14 in the Internet Appendix). This finding is inconsistent with a customer taste-based explanation.

Hypothesis D conjectures that the stock underperformance to high ESG incident rates is driven by reverse causality, implying that managers who predict lower future stock returns implement lower ESG standards today. While I could not identify a quasi-experiment to rule this explanation out, I test it by investing insider trading (following Gompers, Ishii, and Metrick 2003). I collect data on insider trading from FactSet Insiders and calculate an insider trading variable by summing the value of the net insider purchases and dividing it by the firm's market capitalization measured at the end of the previous year. Similar to Gompers, Ishii, and Metrick (2003), I only consider insiders' directly held securities (rather than derivatives) traded at open stock markets. Table IA15 of the Internet Appendix shows that insider trading is weakly positively correlated with high ESG incident rates, suggesting that insiders expect a similar or even better stock performance. This is inconsistent with a reverse causality explanation implying that insiders predict lower returns.

Hypothesis E puts forward that the negative relation between ESG incident rates and future stock returns may be attributed to an omitted variable. Absent of a quasi-experiment, I make my results as robust as possible by employing different empirical strategies. First, ESG incident events are associated with negative event returns, which establishes that incidents negatively impact firm value. While the event study alleviates concerns about omitted variable bias or reverse causality, it is only a necessary but not a sufficient condition for the interpretation that poor ESG practices negatively impact firm value. Second, high ESG incident rates can predict not only future incidents and lower profits, but also negative long-run stock returns, especially when

investor attention is more limited. This suggest that the underperformance is related to a firm fundamental that is difficult to value, with poor ESG practices being the most likely contender. In fact, I provide evidence that one-fifth of the negative returns to high ESG incident rates arise from negative event returns associated with the materialization of subsequent ESG incident news. Finally, my results are robust not only against numerous controls, including book assets, corporate financials, business operation variables, corporate governance, and stock measures, but also against unobserved firm, industry, and time fixed effects.

7. Conclusions

This paper uses ESG incident news data to study the value and return implications of poor ESG practices. I find that firms with high ESG incident rates are associated not only with more future incidents and weaker profitability, but also with lower risk-adjusted stock returns. A portfolio with high ESG incident rates generates abnormal stock returns of -3.5% per year in the United States and -2.5% per year in Europe, even when controlling for risk factors, industries, and firm characteristics. Negative analyst surprises suggest that these abnormal returns arise from markets underreacting to firms' past ESG incident rates. In line with this, about three-fifths of the underperformance of firms with high ESG incident rates materializes around earnings announcements and subsequent ESG incident news. Exploring the mechanisms of the market surprises, I find evidence that the negative returns are more pronounced in firms with lower investor attention, consistent with behavioral biases. Finally, I provide evidence that ESG-aware funds profit from this bias: dedicated ESG funds and institutional-retail twin funds exhibit lower incident exposure and have a better fund performance than their peers.

From a corporate perspective, these findings emphasize the long-term costs of poor ESG practices and suggest that stock markets underreact to these value implications due to limited investor attention. The market underreaction results in stock overvaluations and too optimistically forecasted earnings for firms with high ESG incident rates, which in turn may explain why these firms ignore ESG practices. Taken together, the evidence is consistent with Bénabou and Tirole

(2010)'s hypothesis that while poor ESG practices can boost stock prices over the short term, they may negatively impact long-term value through a higher probability of future incidents.

From an investor perspective, my findings emphasize the materiality of incident-based ESG information and call for increased attention toward a firm's history of ESG incident news. Furthermore, excluding firms with high ESG incident rates from a portfolio may result in a better investment performance if a sufficient fraction of investors continues to neglect incident-based ESG information.

Appendix A Variables Description

	ESG incident measures and ESG ratings
High incident score	A dummy indicating whether a firm has a high ESG incident score according to RepRisk's "Peak RRI."
Incident score	RepRisk's "Peak RRI": The measure quantifies a firm's highest exposure to ESG incident news over the past two years. It takes values between 0 and 100, where a higher value indicates that the firm experienced more (or more severe, more novel, or with a higher reach) ESG incidents in the past. Table IA2 of the Internet Appendix describes the parameters of the score. Technically, RepRisk calculates the "Peak RRI" as the two-year maximum value of the "Current RRI."
Number of incidents	The natural log of the total number of a firm's ESG incident news in the RepRisk database over the past two years.
Short-term incident score	RepRisk's "Current RRI": A short-term measure of a firm's history of ESG incident news. The score increases when a company has a new incident, and it decays when there are no new incidents to a low incident score within a maximum of 6 months.
Std(disagreement) Range(disagreement)	The standard deviation or range of a firm's ESG ratings from Asset 4, Sustainalytics, Bloomberg, Inrate, MSCI KLD, and MSCI IVA. The measures are provided by Gibson Brandon et al. (2019) and capture the disagreement between these ESG ratings.
Net KLD	The net KLD is the difference between KLD strengths and KLD concerns.
KLD strengths KLD concerns	KLD strengths are the sum of all KLD strengths, which are binary ESG criteria assessing a firm's ESG-related strengths along multiple dimensions. Similarly, KLD concerns are the sum of a firm's ESG-related weaknesses.
	Stock-level variables
Market cap	The natural log of the stock's market capitalization from CRSP in billions.
Book-to-market$_{FY}$	The book-to-market ratio measured at fiscal year-end. It is calculated as the ratio of the common equity (Compustat item 60) plus deferred taxes (Compustat item 74) over the market value of common stock (Compustat items 24×25).
Book-to-market$_{CY}$	The natural log of the book-to-market ratio. Book value is the sum of book common equity (Compustat item 60) and deferred taxes (Compustat item 74) from the most recent fiscal year before calendar year-end. Market value is price multiplied by shares outstanding (from CRSP) measured at calendar year-end.
Dividend yield	The ratio of common dividends (Compustat item 21) in the fiscal year over market capitalization measured at calendar year-end.
Returns t-X to -X	The natural log of the cumulative stock returns measured over months t-X to -X from CRSP.
Dollar volume	The natural log of the dollar trading volume from CRSP in millions.

Stock price	The natural log of the reciprocal of the stock price from CRSP.
Idiosyncratic volatility	The natural log of idiosyncratic volatility relative to market-wide variation. The variable is calculated each month based on daily stock returns from CRSP.
	Firm-level variables
Total book assets	The natural log of the total book assets (Compustat item 6).
Investment	The percentage growth in total book assets (Compustat item 6) between two fiscal years.
Profitability	The ratio of revenue (Compustat item 12) minus costs of goods sold (Compustat item 41) over total book assets.
Return on assets	The ratio of net income (Compustat item 172) over total book assets.
Dividends	The ratio of common dividends (Compustat item 21) over total book assets.
Cash holdings	The ratio of cash holdings (Compustat item 1) over total book assets.
Leverage	The sum of the long-term debt (Compustat item 9) and current debt (Compustat item 34) over total book assets.
CAPEX	The ratio of capital expenditures (Compustat item 128) over total book assets.
PPE	The ratio of total net property, plant, and equipment (Compustat item 8) over total book assets.
RD	The ratio of research and development expenditures (Compustat item 46) over total book assets.
Firm age	The natural log of the time in years since the stock first appeared in CRSP.
SP 500	A dummy indicating whether a firm is a member of the S&P 500.
X missing	A dummy indicating whether variable X is missing in Compustat.
	Ownership and analyst variables
Short-term IO	The percentage of outstanding shares held by short-term institutional investors. Short-term investors are investors with a portfolio churn ratio (see Gaspar, Massa, and Matos 2005) in the third tercile. Investor holdings data is obtained from FactSet Ownership.
Forecast error	The difference between the actual earnings and the median analyst consensus from IBES measured eight months ago, scaled by the stock price at the end of the fiscal year.
Actual - Forecast	The difference between the actual earnings and the earnings forecast of an analyst measured eight months ago, scaled by the stock price at the end of the fiscal year.
Earnings announcement returns	The earnings announcement returns are the three-day cumulative abnormal returns of quarterly earnings announcements, estimated with the market model and winsorized at the 1% and 99% levels.
Analyst forecast dispersion	The standard deviation of the analyst's earnings forecasts divided by the absolute value of the mean forecast.
Analyst coverage	The number of analysts that cover a stock.

Mutual fund variables

Fund incident score Fund number of incidents Fund short-term incident score	Aggregated measures of a fund's future incident exposure. I calculate the measure as the value-weighted average of the 3-month forward ESG incident rates of the positions of a fund. The stock-level incident rate measures are described under "ESG incident measures and ESG ratings." The fund holding data is obtained from the CRSP database.
ESG fund	A dummy indicating whether a fund is flagged as an ESG fund by Morningstar or if the fund has one of the following keywords in its name: ESG, responsible, impact, fossil, SRI, sustainable.
Twin non-ESG fund	A dummy indicating whether a fund is an institutional-retail fund that is not also an ESG fund.
Total net assets	The natural logarithm of the total net assets of a mutual fund from Morningstar.
Family net assets	The natural logarithm of the total net assets of a fund family.
Expense ratio	The net expense ratio of a mutual fund.
Fund turnover	The turnover of a mutual fund.
Fund returns	The raw returns of a mutual fund.
Fund benchmark-adj returns	The benchmark-adjusted returns of a mutual fund. I calculate the variable as the difference between the raw returns of a fund and the returns of its benchmark group.
Fund 4-factor alpha	The 4-factor alpha of a mutual fund. For each fund-month, I regress the excess fund returns on four US factors (MKT, SMB, HML, MOM) using the previous 36 months of return data. Using these estimated factor loadings, I subtract the fund's expected return from the realized fund returns to obtain the fund's 4-factor alpha in each month.

Appendix B ESG Incidents in the RepRisk Dataset

Environmental Incidents

- Impacts on ecosystem/landscapes, such as contamination of groundwater, forests, rivers, or seas, deforestation, or impacts on wildlife.
- Global pollution and climate change, which includes atmospheric pollution and criticism related to climate change, carbon, and other greenhouse gas emissions.
- Local pollution, which is pollution into local air, water, and soil.
- Overuse and wasting of resources, which includes inefficient use or waste of renewable or nonrenewable resources, such as water, energy, or commodities.
- Waste issues, such as inappropriate disposal or handling of waste.
- Animal mistreatment, which includes torture, mistreatment, or abuse of animals, through experiments, husbandry, or trophy hunting.

Social Incidents

- Impacts on communities, such as land- or water-grabbing, negative impacts on a community's livelihood or employment opportunities, relocation of communities, safety impacts, or access to lifesaving drugs.
- Human rights abuses and corporate complicity, such as violence against humans, human trafficking, organ trafficking, privatization of water sources, supporting oppressive regimes, or supporting terrorist organizations.
- Local participation issues, which arise when local communities or individuals are not consulted about the firm's activities or when they do not benefit appropriately, and when critics are silenced by unethical tactics.
- Social discrimination, which refers to treating people differently because of certain characteristics, such as gender, race, ethnicity, or religion.
- Child labor, which also includes child prostitution, pornography, and trafficking.
- Forced labor, such as bonded labor, prison labor, exploitative practices, restrictions on freedom of movement, or withholding of wages.
- Occupational health and safety issues, such as lack of safety for employees at work or negligence resulting in work-related accidents.
- Discrimination in employment, which is social discrimination against employees.

Social Incidents (continued)

- Poor employment conditions, such as "slave-like" working conditions, issues with labor contracts or pay, or spying on employees.
- Freedom of association and collective bargaining, which refers to violations of workers' rights to organize and collectively bargain.

Governance Incidents

- Corruption, bribery, extortion, and money laundering, which includes slush funds, aggressive lobbying, overcharging, and nepotism.
- Fraud, which is intentional deception for personal gain or damage to another individual, including counterfeiting, false advertising, misleading investors, or stock price manipulations.
- Tax evasion, such as not paying taxes by illegal means and the use of tax havens.
- Tax optimization, which is the non-illegal practice of minimizing tax liability.
- Anti-competitive practices, which are practices that prevent, reduce, or manipulate competition in markets, such as bid rigging, dumping, exclusive dealing, or price fixing.
- Executive compensation issues, such as excessive salaries or bonuses.
- Misleading communication, such as "greenwashing," false advertising, off-label marketing, or "astroturfing."

Miscellaneous Incidents

- Products and services issues resulting in health or environmental damage, such as toxic or dangerous products, contaminated food, and medical treatments with unintended health consequences.
- Controversial products and services, which refer to the sale of products or services that provoke strong disagreement or disapproval (e.g., alcohol, weapons, gambling).
- Supply chain issues, which refer to problems at suppliers, vendors, or subcontractors.
- Violation of international standards, set by international governmental organizations or treaties with a global nature and international customary law.
- Violation of national legislation, which refers to the violation of national and state legislation related to environmental, social, and governance issues.

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Figure 1: Descriptive statistics about ESG incidents

Panel A shows the number of ESG incident news per year and ESG dimension. Panel B shows the number of ESG incident news per industry and ESG dimension. Panel C shows the number of new ESG incident news per lagged *Incident score*, which takes higher values if a firm had a higher ESG incident rate in the past. Values of 0–25, 26–50, and 51–100 indicate low, medium, and high incident scores, respectively. This panel shows that about half of all new incidents happen at firms that already had high incident scores. Industry classification is based on SIC1 codes and contains the following industries: manufacturing, finance, mining, transportation and utilities, services, retail trading, government, wholesale trading, agriculture, and construction. The sample period is from January 2007 to December 2017. The ESG incident news data is obtained from RepRisk.

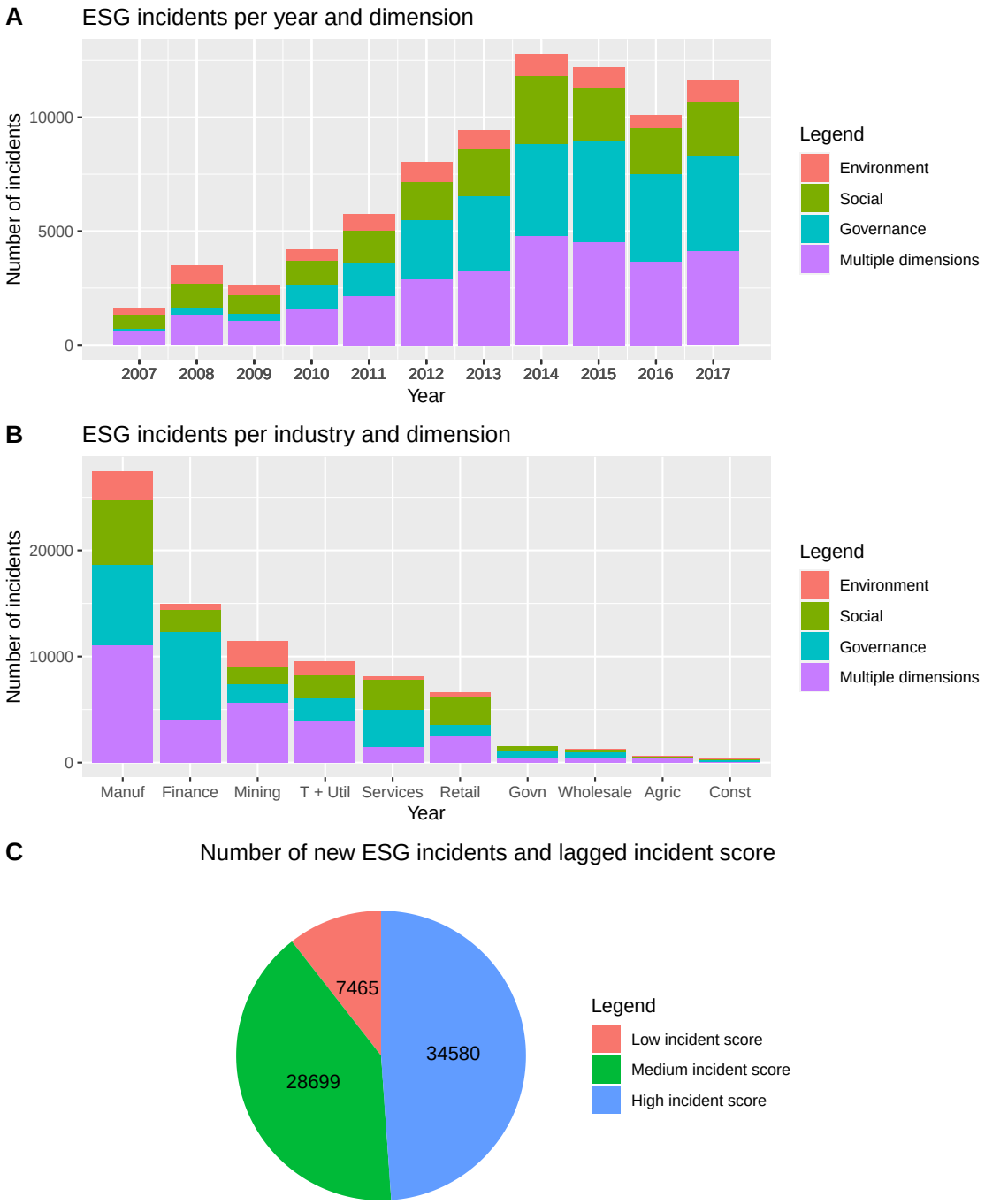

Table 1: Descriptive statistics of the US sample

This table presents the mean, median, standard deviation (Std), 10%-quantile (St10), 90%-quantile (St90), the number of observations (Obs) of different variables in the US sample. Panel A shows statistics for the *Incident score* per industry. Panel B shows statistics for the full sample and Panel C shows all firms with high incident scores. Appendix A provides definitions of all variables. Market cap and total book assets are in billions of US dollars.

Panel A: Incident score per industry

Industry	Mean	Median	Std	St10	St90	Obs
Agriculture	18.264	19	18.491	0	52	636
Mining	21.582	25	17.870	0	45	15,200
Construction	18.356	23	15.204	0	36	2,489
Manufacturing	20.160	25	17.261	0	40	58,460
Transport and utilities	22.267	25	15.435	0	40	22,050
Wholesale retail	16.138	19	14.825	0	35	4,182
Retail	22.419	25	17.378	0	42	13,846
Finance	17.821	20	16.807	0	37	28,633
Services	16.216	19	16.135	0	36	24,186
Government	15.497	14	16.455	0	36	7,950

Panel B: Full sample from January 2007 to December 2017

Variable	Mean	Median	Std	St10	St90	Obs
Incident score	19.540	24	16.878	0	40	198,024
Short-term incident score	9.410	0	12.402	0	25	239,122
Number of incidents	6.757	1	25.610	0	14	198,024
Market cap	9.589	1.998	29.185	0.163	20.467	239,122
Total book assets	26.565	2.877	143.967	0.241	36.042	229,683
Book-to-market$_{FY}$	0.597	0.494	0.963	0.132	1.206	214,775
Dividend yield	0.097	0.006	2.261	0	0.057	228,262

Panel C: Firms with high incident scores

Variable	Mean	Median	Std	St10	St90	Obs
Incident score	58.483	58	5.382	52	66	7,439
Short-term incident score	42.431	44	13.968	24	60	7,439
Number of incidents	96.039	65	88.690	23	224	7,439
Market cap	80.922	36.859	107.134	1.927	220.080	7,439
Total book assets	315.052	77.478	603.198	8.848	938.555	7,300
Book-to-market$_{FY}$	0.621	0.491	0.542	0.146	1.252	6,631
Dividend yield	0.199	0.026	0.685	0	0.412	7,194

Table 2: High ESG incident rates and conventional ESG ratings

This table regresses ESG ratings on *High incident score*, a dummy that takes the value of one when a company had a high ESG incident rate over the past two years. The dependent variables in the first two columns are the standard deviation and the range of six different conventional ESG ratings: Asset 4, Sustainalytics, Bloomberg, Inrate, MSCI KLD, and MSCI IVA. The dependent variables in the last three columns are the net KLD score, the KLD strengths score, and the KLD concerns score. Appendix A provides definitions of the variables. Robust standard errors double clustered at the firm level and year level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:				
	Std(disagreement)	Range(disagreement)	Net KLD	KLD strengths	KLD concerns
	(1)	(2)	(3)	(4)	(5)
High incident score	0.0279***	0.0649***	0.1736	2.5344***	2.3608***
	(0.0076)	(0.0178)	(0.3114)	(0.3536)	(0.3163)
Total book assets	0.0043	0.0105	0.4204***	0.7664***	0.3461***
	(0.0029)	(0.0073)	(0.1129)	(0.0684)	(0.0682)
Book-to-market$_{FY}$	0.0122*	0.0296*	−0.0715	−0.1297**	−0.0583***
	(0.0064)	(0.0152)	(0.0473)	(0.0392)	(0.0165)
Leverage	−0.0112	−0.0398	−0.3739*	−0.5042**	−0.1304
	(0.0140)	(0.0349)	(0.1772)	(0.1777)	(0.0861)
CAPEX	−0.0709	−0.1083	2.1084*	1.3572	−0.7512
	(0.0938)	(0.2399)	(0.9228)	(0.7620)	(0.4775)
CAPEX missing	−0.0098	−0.0561	−0.7618**	−0.7925***	−0.0307
	(0.0209)	(0.0416)	(0.3166)	(0.2199)	(0.2701)
PPE	0.0255	0.0484	−0.5820*	−0.2216	0.3604*
	(0.0270)	(0.0698)	(0.2695)	(0.2323)	(0.1835)
PPE missing	0.0518	0.1029	−0.2415	−0.7322*	−0.4907**
	(0.0293)	(0.0554)	(0.3238)	(0.3251)	(0.1962)
RD	0.0744	0.1494	2.1037**	2.3904***	0.2867
	(0.1040)	(0.2336)	(0.6657)	(0.5372)	(0.2189)
RD missing	0.0008	−0.0035	−0.4672***	−0.5519***	−0.0847
	(0.0100)	(0.0258)	(0.1133)	(0.1048)	(0.0605)
Firm age	−0.0013	0.0013	0.1154**	0.2021***	0.0867**
	(0.0032)	(0.0079)	(0.0485)	(0.0435)	(0.0372)
SP 500	0.0056	0.0186	1.4419***	1.5730***	0.1311
	(0.0061)	(0.0139)	(0.2744)	(0.2599)	(0.1164)
Industry-year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	2,944	2,944	11,508	11,508	11,508
Adjusted R^2	0.1150	0.1047	0.3383	0.5079	0.5081

Table 3: ESG incident rates and future incidents

Panel A regresses the logarithm of the total number of new ESG incidents in the next year on lagged ESG incident measures and firm controls. The four ESG incident measures are a dummy indicating whether a firm has a high ESG incident rate (*High incident score*), the ESG incident rate over the past two years (*incident score*), the logarithm of the total number of ESG incident news (*Number of incidents*), and a short-term version of the incident score (*Short-term incident score*). All measures take higher values when a company had more ESG incident news in the past. Panel B regresses the number of next year's incidents either on the lagged disagreement among conventional ESG ratings or on lagged ESG ratings from KLD, using similar controls. Appendix A provides definitions for the variables. Robust standard errors double clustered at the firm level and year level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Predictive power of incident measures

	Dependent variable:			
	Number of new incidents in t+1			
	(1)	(2)	(3)	(4)
High incident score	1.7424***			
	(0.0824)			
Incident score		0.0184***		
		(0.0007)		
Number of incidents			0.5994***	
			(0.0153)	
Short-term incident score				0.0355***
				(0.0014)
Total book assets	0.2574***	0.2461***	0.1061***	0.1917***
	(0.0194)	(0.0227)	(0.0117)	(0.0187)
Book-to-market$_{FY}$	−0.0140**	−0.0112**	−0.0060**	−0.0098**
	(0.0049)	(0.0045)	(0.0025)	(0.0039)
Return on assets	−0.4074***	−0.3947***	−0.1464**	−0.3112***
	(0.1011)	(0.1113)	(0.0618)	(0.0810)
Dividends	0.6157**	0.6518**	0.2855**	0.4223**
	(0.2107)	(0.1946)	(0.1091)	(0.1534)
Cash	0.4529***	0.4732***	0.2038***	0.3649***
	(0.0620)	(0.0688)	(0.0327)	(0.0495)
Leverage	−0.0754	−0.1026*	−0.0280	−0.0859*
	(0.0602)	(0.0517)	(0.0263)	(0.0448)
CAPEX	0.0526	0.1713	0.1877**	0.0386
	(0.1553)	(0.1404)	(0.0678)	(0.1254)
CAPEX missing	0.0951	0.0494	−0.0055	0.0472
	(0.1750)	(0.1945)	(0.1191)	(0.1416)
PPE	0.0543	0.0189	−0.0295	0.0279
	(0.0697)	(0.0659)	(0.0284)	(0.0520)
PPE missing	−0.4547***	−0.3763***	−0.1784***	−0.2921***
	(0.0943)	(0.1006)	(0.0525)	(0.0841)
RD	0.0200	0.0596	0.0396	0.0023
	(0.0657)	(0.0734)	(0.0423)	(0.0758)
RD missing	−0.0727**	−0.1075***	−0.0564***	−0.0822***
	(0.0266)	(0.0273)	(0.0106)	(0.0211)
Firm age	0.0190*	0.0117	−0.0066	0.0126
	(0.0089)	(0.0093)	(0.0049)	(0.0074)
SP 500	0.2880***	0.2103***	0.0856***	0.1720***
	(0.0379)	(0.0416)	(0.0177)	(0.0321)
Industry-year FE	*Yes*	*Yes*	*Yes*	*Yes*
Observations	13,837	13,837	13,837	15,774
Adjusted R^2	0.5974	0.5729	0.7296	0.6275

Table 3: ESG incident rates and future incidents (contd.)

Panel B: Predictive power of conventional ESG ratings

	Dependent variable:				
	Number of new incidents in t+1				
	(1)	(2)	(3)	(4)	(5)
Std(disagreement)	1.3732***				
	(0.3134)				
Range(disagreement)		0.5325***			
		(0.1290)			
Net KLD			0.0105		
			(0.0064)		
KLD strengths				0.0810***	
				(0.0074)	
KLD concerns					0.1334***
					(0.0176)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Industry-year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	2,514	2,514	13,855	13,855	13,855
Adjusted R^2	0.6157	0.6154	0.5159	0.5469	0.5586

Table 4: ESG incident rates and future profitability

The table regresses return on assets (ROA) on lagged ESG incident measures and firm controls. The four ESG incident measures are the *High incident score*, *Incident score*, *Number of incidents*, and *Short-term incident score*. The dependent variable is winsorized at the 5% and 95% levels. All coefficients are multiplied by 100. Appendix A provides definitions for the variables. Robust standard errors double clustered at the firm level and year level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:			
	Return on assets in t+1			
	(1)	(2)	(3)	(4)
High incident score	-2.408^{***}			
	(0.629)			
Incident score		-0.045^{***}		
		(0.009)		
Number of incidents			-0.976^{***}	
			(0.192)	
Short-term incident score				-0.057^{***}
				(0.012)
Total book assets	1.636^{***}	1.732^{***}	1.884^{***}	1.712^{***}
	(0.212)	(0.210)	(0.248)	(0.206)
Book-to-market$_{FY}$	-1.092^{***}	-1.099^{***}	-1.110^{***}	-1.258^{***}
	(0.291)	(0.289)	(0.291)	(0.352)
Leverage	-5.307^{***}	-5.290^{***}	-5.411^{***}	-5.805^{***}
	(1.423)	(1.457)	(1.467)	(1.435)
CAPEX	9.428^{*}	9.298^{*}	9.309^{*}	9.246^{**}
	(5.120)	(5.149)	(5.106)	(4.499)
CAPEX missing	-3.006^{***}	-2.986^{***}	-2.895^{***}	-1.749
	(0.964)	(0.968)	(0.894)	(1.242)
PPE	0.077	0.132	0.132	0.339
	(1.291)	(1.299)	(1.300)	(1.216)
PPE missing	-1.970^{**}	-2.182^{***}	-2.431^{***}	-2.251^{***}
	(0.776)	(0.788)	(0.764)	(0.787)
RD	-43.118^{***}	-43.034^{***}	-42.643^{***}	-44.890^{***}
	(9.764)	(9.733)	(9.675)	(9.403)
RD missing	-0.869^{**}	-0.845^{**}	-0.917^{**}	-0.911^{**}
	(0.405)	(0.412)	(0.407)	(0.404)
Firm age	0.732^{***}	0.760^{***}	0.768^{***}	0.657^{***}
	(0.228)	(0.226)	(0.232)	(0.205)
SP 500	0.352	0.524	0.691^{*}	0.573
	(0.403)	(0.396)	(0.367)	(0.364)
Industry-year FE	*Yes*	*Yes*	*Yes*	*Yes*
Observations	13,896	13,896	13,896	15,851
Adjusted R^2	0.302	0.304	0.305	0.288

Table 5: Event returns of ESG incident news

This table presents the results of several event studies. An event is a positive change in the *Short-term incident score* indicating that a firm had one or more ESG incident news in that month. A higher increase indicates ESG incidents that are more severe, have a higher reach, or are more novel. The columns show the minimum increase in the *Short-term incident score* (Increase), the length of the event window (Window), the number of events (Events), the mean of the cumulative abnormal returns (CAR), and the *t*-statistic (t-stat). Panel A uses the market model to estimate the firm's normal stock returns, Panel B uses the four-factor Carhart (1997) model, and Panel C uses the corresponding 48-industry Fama and French (1997) model. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Market model

Increase	Window	Events	CAR	t-stat
Short-term incident score(>=10)	[-10;+10]	6780	−0.514	-3.79^{***}
Short-term incident score(>=10)	[-15;+15]	6766	−0.628	-3.81^{***}
Short-term incident score(>=20)	[-10;+10]	3282	−0.737	-3.41^{***}
Short-term incident score(>=20)	[-15;+15]	3273	−0.816	-3.11^{***}
Short-term incident score(>=30)	[-10;+10]	1375	−2.108	-5.97^{***}
Short-term incident score(>=30)	[-15;+15]	1371	−2.353	-5.50^{***}
Short-term incident score(>=40)	[-10;+10]	228	−3.641	-4.47^{***}
Short-term incident score(>=40)	[-15;+15]	226	−2.910	-2.98^{***}

Panel B: Four-factor model

Increase	Window	Events	CAR	t-stat
Short-term incident score(>=10)	[-10;+10]	6780	−0.478	-3.67^{***}
Short-term incident score(>=10)	[-15;+15]	6766	−0.687	-4.34^{***}
Short-term incident score(>=20)	[-10;+10]	3282	−0.735	-3.53^{***}
Short-term incident score(>=20)	[-15;+15]	3273	−0.877	-3.47^{***}
Short-term incident score(>=30)	[-10;+10]	1375	−2.042	-5.97^{***}
Short-term incident score(>=30)	[-15;+15]	1371	−2.406	-5.81^{***}
Short-term incident score(>=40)	[-10;+10]	228	−3.627	-4.62^{***}
Short-term incident score(>=40)	[-15;+15]	226	−2.666	-2.83^{***}

Panel C: Industry model

Increase	Window	Events	CAR	t-stat
Short-term incident score(>=10)	[-10;+10]	6780	−0.458	-3.51^{***}
Short-term incident score(>=10)	[-15;+15]	6766	−0.599	-3.78^{***}
Short-term incident score(>=20)	[-10;+10]	3282	−0.643	-3.05^{***}
Short-term incident score(>=20)	[-15;+15]	3273	−0.747	-2.92^{***}
Short-term incident score(>=30)	[-10;+10]	1375	−1.978	-5.72^{***}
Short-term incident score(>=30)	[-15;+15]	1371	−2.191	-5.23^{***}
Short-term incident score(>=40)	[-10;+10]	228	−3.735	-4.70^{***}
Short-term incident score(>=40)	[-15;+15]	226	−3.037	-3.19^{***}

Table 6: ESG incident rates and future returns—portfolio-level regressions

This table presents the results of monthly time-series regressions of portfolios with different ESG incident rates on risk factors. Panel A shows the results for the four US Carhart (1997) factors, and Panel B shows the results for the four US and four world Carhart (1997) factors. The first three columns show equal-weighted portfolios, and the last three columns show value-weighted portfolios. I create the portfolios based on the *Incident score*. Index values of 0–25, 26–50, and 51–100 indicate low, medium, and high incident scores, respectively. Appendix A describes the variable in more detail. Standard errors calculated according to Newey and West (1987) are reported in parenthesis. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Four-factor US model

	Dependent variable:					
	Equal-weighted portfolio			Value-weighted portfolio		
	Low	Mid	High	Low	Mid	High
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	−0.0001	−0.0012	−0.0058***	0.00001	−0.0001	−0.0025**
	(0.0012)	(0.0010)	(0.0017)	(0.0007)	(0.0004)	(0.0010)
MKT	1.0676***	1.0691***	1.2049***	1.0333***	0.9691***	1.0502***
	(0.0223)	(0.0271)	(0.0596)	(0.0195)	(0.0112)	(0.0230)
SMB	0.6692***	0.3544***	−0.2454***	0.2457***	−0.0444**	−0.4434***
	(0.0445)	(0.0432)	(0.0759)	(0.0237)	(0.0191)	(0.0530)
HML	0.0590	0.0854**	0.0691	−0.0764***	−0.0480***	0.1389***
	(0.0609)	(0.0373)	(0.0507)	(0.0236)	(0.0149)	(0.0368)
MOM	−0.2816***	−0.2150***	−0.1741***	−0.0474***	−0.0187**	0.0588**
	(0.0404)	(0.0186)	(0.0322)	(0.0123)	(0.0074)	(0.0256)
Observations	108	108	108	108	108	108
Adjusted R^2	0.9724	0.9675	0.9122	0.9801	0.9876	0.9357

Panel B: Eight-factor world model

	Dependent variable:					
	Equal-weighted portfolio			Value-weighted portfolio		
	Low	Mid	High	Low	Mid	High
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	−0.0004	−0.0011	−0.0033***	0.0006	−0.0001	−0.0026**
	(0.0011)	(0.0009)	(0.0011)	(0.0007)	(0.0004)	(0.0011)
MKT	0.9854***	0.8809***	0.3946**	0.8357***	0.9627***	0.9322***
	(0.0940)	(0.0928)	(0.1645)	(0.0760)	(0.0514)	(0.1443)
SMB	0.5775***	0.3243***	−0.1071	0.3304***	−0.0338	−0.5049***
	(0.0574)	(0.0622)	(0.0987)	(0.0444)	(0.0292)	(0.0930)
HML	0.0219	0.0390	0.2192*	−0.0351	−0.0947**	0.2535***
	(0.1021)	(0.0832)	(0.1214)	(0.0565)	(0.0364)	(0.0947)
MOM	−0.2711***	−0.2141***	−0.0613	−0.0923***	−0.0415*	0.0708
	(0.0504)	(0.0440)	(0.0863)	(0.0329)	(0.0226)	(0.0576)
WMKT	0.1149	0.2035**	0.7731***	0.1721***	0.0054	0.1344
	(0.0998)	(0.0904)	(0.1657)	(0.0649)	(0.0460)	(0.1299)
WSMB	0.2589***	0.1430	−0.0852	−0.1566**	−0.0188	0.1703
	(0.0886)	(0.0918)	(0.1752)	(0.0726)	(0.0409)	(0.1351)
WHML	0.1120	0.1326	−0.1364	−0.0527	0.0817	−0.1563
	(0.1444)	(0.1175)	(0.2010)	(0.0757)	(0.0519)	(0.1457)
WMOM	0.0282	0.0445	−0.0617	0.0722*	0.0338	0.0127
	(0.0741)	(0.0563)	(0.1187)	(0.0409)	(0.0306)	(0.0717)
Observations	108	108	108	108	108	108
Adjusted R^2	0.9755	0.9713	0.9330	0.9814	0.9876	0.9376

Table 7: ESG incident rates and future returns—portfolio-level robustness

Panel A presents robustness checks to the baseline results on the US portfolio with high ESG incident rates. The 4-factor model has the four US Carhart (1997) factors, and the 8-factor model has the four US and four world Carhart (1997) factors. In the first row, I construct an industry-adjusted portfolio by deducting the returns of the value-weighted 48-industry portfolios of Fama and French (1997) from the raw stock returns. In the second row, I match each high-incident-score firm with three comparable low-incident-score firms. The matching is based on the sic2 industry, the logarithm of the total book assets, and the logarithm of the book-to-market ratio, using the Mahalanobis distance criterion. In the third row, I winsorize the firm's raw stock returns at the 1% and 99% levels before creating the portfolio. In the fourth row, I estimate the portfolio regression based on weekly returns. Panel B performs out-of-sample tests using European stock data. The 4-factor model has the four European Carhart (1997) factors, and the 8-factor model has the four European and four world Carhart (1997) factors. I show the alphas for an unwinsorized portfolio in the first row and for a winsorized portfolio (at the 1% and 99% levels) in the second row. Standard errors calculated according to Newey and West (1987) are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Portfolio robustness

	Equal-weighted		Value-weighted	
	4-factor	8-factor	4-factor	8-factor
	(1)	(2)	(3)	(4)
Industry-adjusted returns	-0.0043^{***}	-0.0028^{***}	-0.0013	-0.0016^{*}
	(0.0010)	(0.0006)	(0.0008)	(0.0009)
Industry-matched long/short portfolio	-0.0055^{***}	-0.0036^{***}	-0.0027	-0.0039^{**}
	(0.0008)	(0.0011)	(0.0017)	(0.0019)
Winsorized portfolio	-0.0055^{***}	-0.0031^{**}	-0.0022^{**}	-0.0023^{*}
	(0.0019)	(0.0012)	(0.0010)	(0.0012)
Weekly returns (473 observations)	-0.0010^{***}	-0.0007^{**}	-0.0006^{**}	-0.0006^{**}
	(0.0003)	(0.0003)	(0.0002)	(0.0003)

Panel B: Out-of-sample tests

	Equal-weighted		Value-weighted	
	4-factor	8-factor	4-factor	8-factor
	(1)	(2)	(3)	(4)
European portfolio	0.0004	-0.0014	-0.0014^{*}	-0.0027^{***}
	(0.0015)	(0.0015)	(0.0008)	(0.0008)
European portfolio (winsorized)	-0.0011	-0.0024^{*}	-0.0018^{**}	-0.0028^{***}
	(0.0012)	(0.0013)	(0.0007)	(0.0008)

Table 8: ESG incident rates and future returns—stock-level regressions

This table regresses raw stock returns on lagged ESG incident measures and firm and stock controls. The four ESG incident measures are the *High incident score*, *Incident score*, *Number of incidents*, and *Short-term incident score*. The dependent variable is winsorized at the 1% and 99% levels. Appendix A provides definitions of the variables. Standard errors double clustered at the firm level and month level are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:			
	Stock return in t+2			
	(1)	(2)	(3)	(4)
High incident score	-0.003233^{*}			
	(0.001667)			
Incident score		-0.000078^{***}		
		(0.000028)		
Number of incidents			-0.001167^{**}	
			(0.000537)	
Short-term incident score				-0.000065^{*}
				(0.000036)
Market cap	0.001988	0.002218	0.002417^{*}	0.002066^{*}
	(0.001440)	(0.001410)	(0.001373)	(0.001227)
Book-to-market$_{CY}$	0.000507	0.000676	0.000769	0.000445
	(0.000691)	(0.000686)	(0.000685)	(0.000616)
Dividend yield	−0.000127	−0.000118	−0.000102	−0.000092
	(0.000084)	(0.000082)	(0.000080)	(0.000075)
Returns t-3 to -2	0.000392	0.000113	0.000044	0.003976
	(0.009318)	(0.009333)	(0.009324)	(0.008132)
Returns t-6 to -4	−0.003447	−0.003728	−0.003798	−0.003960
	(0.008527)	(0.008554)	(0.008563)	(0.007675)
Returns t-12 to -7	0.001598	0.001359	0.001332	0.002377
	(0.005640)	(0.005649)	(0.005649)	(0.005173)
Dollar volume	−0.001682	−0.001629	−0.001678	-0.001803^{*}
	(0.001142)	(0.001142)	(0.001139)	(0.001027)
Stock price	−0.000762	−0.000667	−0.000602	−0.001127
	(0.000838)	(0.000839)	(0.000840)	(0.000782)
Idiosyncratic volatility	−0.000518	−0.000502	−0.000484	−0.000701
	(0.000492)	(0.000489)	(0.000483)	(0.000503)
Investment	0.000097	0.000088	0.000091	−0.000077
	(0.000244)	(0.000246)	(0.000247)	(0.000148)
Profitability	0.006905^{**}	0.007099^{**}	0.007092^{**}	0.007399^{***}
	(0.002993)	(0.002991)	(0.002987)	(0.002637)
Month FE	*Yes*	*Yes*	*Yes*	*Yes*
Observations	161,757	161,757	161,757	194,433
Adjusted R^2	0.191007	0.191075	0.191060	0.205890

Table 9: ESG incident rates and analysts' forecast errors

This table regresses analysts' forecast errors on lagged ESG incident rates and firm controls. Panel A looks at the median forecast error, defined as the difference between the actual earnings and the analyst consensus, scaled by the stock price at the end of the fiscal year. Panel B looks at the individual forecast errors of analysts. Forecast errors of larger than 10% of the stock price are deleted. Appendix A provides definitions of the variables. All coefficients are multiplied by 100. Standard errors double clustered at the firm level and year level are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: With industry and year FE (IBES Summary)

	Dependent variable:			
	Forecast error in t+1			
	(1)	(2)	(3)	(4)
High incident score	-0.412^{***}			
	(0.140)			
Incident score		-0.003^{*}		
		(0.002)		
Number of incidents			-0.081^{***}	
			(0.030)	
Short-term incident score				-0.006^{***}
				(0.002)
Total book assets	0.095^{***}	0.096^{***}	0.114^{***}	0.084^{***}
	(0.017)	(0.020)	(0.020)	(0.025)
Book-to-market$_{CY}$	-0.103^{***}	-0.106^{***}	-0.107^{***}	-0.107^{***}
	(0.037)	(0.038)	(0.038)	(0.039)
Industry-year FE	*Yes*	*Yes*	*Yes*	*Yes*
Observations	11,301	11,301	11,301	12,747
Adjusted R^2	0.061	0.060	0.061	0.066

Panel B: With analyst-year and industry-year FE (IBES Detail)

	Dependent variable:			
	(Actual – Forecast) in t+1			
	(1)	(2)	(3)	(4)
High incident score	-0.301^{***}			
	(0.081)			
Incident score		-0.003^{*}		
		(0.002)		
Number of incidents			-0.060^{***}	
			(0.017)	
Short-term incident score				-0.004^{***}
				(0.001)
Total book assets	0.071^{***}	0.067^{***}	0.085^{***}	0.063^{***}
	(0.011)	(0.019)	(0.017)	(0.017)
Book-to-market$_{CY}$	-0.043	-0.044	-0.048	-0.047
	(0.031)	(0.031)	(0.032)	(0.040)
Analyst-year FE	*Yes*	*Yes*	*Yes*	*Yes*
Industry-year FE	*Yes*	*Yes*	*Yes*	*Yes*
Observations	134,623	134,623	134,623	156,921
Adjusted R^2	0.166	0.165	0.166	0.173

Table 10: ESG incident rates and investors' reactions on information-release days

This table presents results on how investors react to information-release events. Panel A regresses quarterly earnings announcement returns on lagged ESG incident measures and firm controls. The cumulative abnormal announcement returns are estimated with the market model and are winsorized at the 1% and 99% levels. The market model is calibrated on a pre-event window ranging from 300 trading days to 46 trading days prior to the event. All coefficients are multiplied by 100. Appendix A provides definitions of the variables. Standard errors double clustered at the firm level and quarter level are presented in parentheses. Panel B shows event studies of *new* ESG incidents at firms with past high incident scores (see Table 5 for a description of the columns). *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Quarterly earnings announcements

	Dependent variable:			
	Earnings announcement return in t+1			
	(1)	(2)	(3)	(4)
High incident score	-0.341^{**}			
	(0.164)			
Incident score		−0.001		
		(0.002)		
Number of incidents			−0.019	
			(0.027)	
Short-term incident score				0.001
				(0.003)
Total book assets	0.024	0.016	0.021	−0.011
	(0.031)	(0.032)	(0.034)	(0.034)
Book-to-market$_{CY}$	−0.018	−0.016	−0.017	0.012
	(0.044)	(0.044)	(0.044)	(0.043)
Quarter FE	Yes	Yes	Yes	Yes
Observations	45,226	45,226	45,226	55,240
Adjusted R^2	0.002	0.002	0.002	0.004

Panel B: New ESG incidents at firms with high ESG incident rates

Increase	Window	Events	CAR	t-stat
Short-term incident score(>=3)	[-10;+10]	1808	−0.309	−1.64
Short-term incident score(>=3)	[-15;+15]	1806	−0.340	−1.50
Short-term incident score(>=5)	[-10;+10]	1131	−0.487	-2.06^{**}
Short-term incident score(>=5)	[-15;+15]	1130	−0.579	-2.04^{**}
Short-term incident score(>=7)	[-10;+10]	793	−0.630	-2.18^{**}
Short-term incident score(>=7)	[-15;+15]	792	−0.669	-1.91^{*}

Table 11: ESG incident rates and future returns—subsample regressions

This table forms subsamples and regresses raw stock returns on lagged ESG incident measures and controls. Panel A divides the sample based on the median institutional ownership by short-term investors. I calculate investor horizon based on the portfolio churn ratio and define short-term investors as investors in the highest tercile. Panel B divides the sample based on the median analyst forecast dispersion, defined by the standard deviation of the analysts' earnings forecasts divided by the absolute value of the mean forecast. Panel C divides the sample based on the median analyst coverage. The dependent variable is winsorized at the 1% and 99% levels. Appendix A provides definitions for the variables. Standard errors double clustered at the firm level and month level are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Short-term institutional ownership

	Dependent variable:							
	Stock return in t+2							
	Low	High	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High incident score	−0.000747	−0.009214**						
	(0.001785)	(0.004574)						
Incident score			−0.000063*	−0.000060				
			(0.000033)	(0.000036)				
Number of incidents					−0.000647	−0.001305*		
					(0.000599)	(0.000676)		
Short-term incident score							−0.000029	−0.000102**
							(0.000040)	(0.000045)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	73,003	69,852	73,003	69,852	73,003	69,852	87,222	84,098
Adjusted R^2	0.173903	0.209716	0.173965	0.209686	0.173927	0.209705	0.186509	0.224965

Panel B: Analyst forecast dispersion

	Dependent variable:							
	Stock return in t+2							
	Low	High	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High incident score	0.001366	−0.007379**						
	(0.001907)	(0.002867)						
Incident score			−0.000030	−0.000103**				
			(0.000029)	(0.000048)				
Number of incidents					0.000070	−0.001660*		
					(0.000550)	(0.000851)		
Short-term incident score							0.000011	−0.000088
							(0.000035)	(0.000059)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	62,897	58,045	62,897	58,045	62,897	58,045	77,758	71,105
Adjusted R^2	0.258174	0.229327	0.258187	0.229351	0.258167	0.229351	0.269481	0.238880

Table 11: ESG incident rates and future returns—subsample regressions (contd.)

Panel C: Analyst coverage

	Dependent variable:							
	Stock return in t+2							
	Low	High	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High incident score	−0.003257	−0.002558						
	(0.003396)	(0.001984)						
Incident score			−0.000101**	−0.000032				
			(0.000040)	(0.000034)				
Number of incidents					−0.002321***	−0.000268		
					(0.000855)	(0.000606)		
Short-term incident score							−0.000114**	−0.000023
							(0.000055)	(0.000039)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	69,629	72,001	69,629	72,001	69,629	72,001	84,933	89,373
Adjusted R^2	0.178807	0.254368	0.178921	0.254360	0.178984	0.254348	0.190006	0.264769

Table 12: ESG incident rates and ESG-aware mutual funds

This table regresses fund measures on indicator variables of ESG funds and twin non-ESG funds and controls. *ESG fund* is a mutual fund that is marketed as an ESG fund, and *Twin non-ESG fund* is an institutional-retail fund that is not also a dedicated ESG fund. The dependent variables are the funds' forward-looking value-weighted incident exposures in Panel A and fund performance measures in Panel B. Appendix A provides definitions of the variables. Both panels control for style-month fixed effects. Standard errors double clustered at the fund level and month level are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Fund's future ESG incident exposure

	Dependent variable:		
	Fund incident score in t+3	Fund number of incidents in t+3	Fund short-term incident score in t+3
	(1)	(2)	(3)
ESG fund	-1.2056^{***}	-0.0897^{***}	-1.3375^{***}
	(0.3540)	(0.0205)	(0.3320)
Twin non-ESG fund	-0.2969^{**}	-0.0183^{**}	-0.2700^{**}
	(0.1437)	(0.0078)	(0.1303)
Total net assets	0.0769^{*}	0.0024	0.0521
	(0.0408)	(0.0022)	(0.0365)
Family net assets	0.0336	0.0033^{*}	0.0532^{*}
	(0.0309)	(0.0017)	(0.0277)
Expense ratio	−0.2668	-0.0213^{**}	-0.3110^{*}
	(0.1823)	(0.0100)	(0.1670)
Fund turnover	−0.0011	−0.0001	−0.0008
	(0.0008)	(0.00004)	(0.0007)
Style x Month FE	Yes	Yes	Yes
Observations	261,509	261,509	261,509
Adjusted R^2	0.8914	0.8674	0.8793

Table 12: ESG incident rates and ESG-aware mutual funds (contd.)

Panel B: Fund's investment performance

	Dependent variable:		
	Fund returns in t+1	Fund benchmark-adj returns in t+1	Fund 4-factor alpha in t+1
	(1)	(2)	(3)
ESG fund	0.0006^{***}	0.0008^{***}	0.0005^{**}
	(0.0002)	(0.0002)	(0.0002)
Twin non-ESG fund	0.0004^{***}	0.0003^{***}	0.0001
	(0.0001)	(0.0001)	(0.0001)
Total net assets	-0.0001^{**}	-0.00005	0.000003
	(0.00003)	(0.00003)	(0.00004)
Family net assets	0.0002^{***}	0.0001^{***}	0.00005^{*}
	(0.00003)	(0.00003)	(0.00002)
Expense ratio	-0.0009^{***}	-0.0007^{***}	-0.0009^{***}
	(0.0002)	(0.0002)	(0.0002)
Fund turnover	-0.000002	-0.000002^{*}	-0.000002^{*}
	(0.000001)	(0.000001)	(0.000001)
Style x Month FE	Yes	Yes	Yes
Observations	363,259	358,651	329,837
Adjusted R^2	0.9270	0.1260	0.2434

INTERNET APPENDIX

Table IA1: Number and frequency of news-based ESG incidents

This table presents the number and frequency of the 28 different ESG incidents tracked by RepRisk. RepRisk collects negative ESG news and links it to single or multiple ESG incidents shown in the table. Column 1 gives the dimension of the incident (an X indicates miscellaneous incidents). Column 3 indicates the total number of incidents. Columns 4 to 9 indicate the relative frequency per industry.

Dim	Incident	Number	Manufact	Finance	Mining	Utility	Service	Retail
X	Violation of national legislation	36,475	32	24	12	11	11	7
S	Impacts on communities	20,213	33	12	25	19	3	3
E	Impacts on ecosystems and landscapes	18,352	34	10	31	16	2	4
E	Local pollution	14,281	35	7	31	21	2	2
S	Human rights abuses and corporate complicity	12,545	33	14	13	7	17	11
G	Fraud	11,797	24	44	7	7	9	4
X	Controversial products and services	9,809	40	38	4	5	4	4
G	Corruption, bribery, extortion, and money laundering	9,649	32	26	19	8	7	3
X	Supply chain (ESG issues)	9,068	43	3	3	3	9	34
E	Global pollution (including climate change)	8,484	25	16	29	22	3	3
S	Poor employment conditions	8,241	38	8	7	9	12	22
X	Products (health and environmental issues)	7,539	59	2	1	3	6	22
G	Anti-competitive practices	7,478	35	18	5	14	21	3
S	Occupational health and safety issues	7,131	43	5	21	8	5	13
G	Misleading communication	4,743	42	14	13	8	7	9
E	Waste issues	4,572	34	6	31	18	3	5
S	Local participation issues	3,416	26	12	39	15	2	3
G	Tax optimization	3,361	32	17	5	9	20	9
S	Freedom of association and collective bargaining	2,602	41	6	11	9	7	22
X	Violation of international standards	2,532	34	24	19	7	5	6
S	Forced labor	2,390	44	9	7	2	7	27
G	Tax evasion	2,364	25	36	7	8	15	5
G	Executive compensation issue	2,263	27	31	8	12	13	6
S	Discrimination in employment	2,147	31	13	4	10	16	23
S	Child labor	2,095	52	10	5	2	7	19
E	Overuse and wasting of resources	1,585	36	7	37	9	3	5
S	Social discrimination	1,143	15	48	3	10	11	10
E	Animal mistreatment	682	38	7	1	5	13	32

Table IA2: Parameters of the RepRisk Index

This table describes the parameters used to calculate the RepRisk Index (RRI). The RRI quantifies a firm's history of ESG incidents and has two main parameters. *Incident score* is the two-year maximum of the RRI and *Short-term incident score* is the current value of the RRI.

Parameters of the RRI

- News Value: The value of the news depends on the reach, severity, and novelty of an incident.
  - Incident Severity: The severity of an incident depends on three questions. First, what are the consequences of the incident with respect to health and safety? Second, what is the extent of the incident in terms of affected people or regions? Third, is the incident the result of an accident, of negligence, or of intention?
  - Incident Reach: The reach of the information source, in which the ESG incident appeared, depends on RepRisk's own rating of sources. Low-influence sources include local media, smaller NGOs, local government bodies, blogs, and internet sites. Medium-influence sources include national and regional media, international NGOs, and state, national, and international governmental bodies. High-influence sources are the international media, such as the *Financial Times*, the *New York Times*, and others.
  - Incident Novelty: The novelty of an incident depends on whether the firm had similar incidents in the past. For example, if a firm had many workplace injuries in the past, new workplace injuries would not be considered novel incidents.
- News Intensity: The intensity of the news about the incident depends on the frequency and timing of the information. The sequence of the news, however, is no parameter in the calculation of the index.

Table IA3: ESG incident rates and future incidents with firm fixed effects

This table regresses the logarithm of the total number of new ESG incidents in the next year on ESG incident measures and firm controls. The four ESG incident measures are a dummy indicating whether a firm has a high ESG incident rate (*High incident score*), the ESG incident rate over the past two years (*incident score*), the logarithm of the total number of ESG incident news (*Number of incidents*), and a short-term version of the incident score (*Short-term incident score*). All measures take higher values when a company had a higher ESG incident rate in the past. Appendix A provides definitions for the variables. Robust standard errors double clustered at the firm level and year level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:			
	Number of new incidents in t+1			
	(1)	(2)	(3)	(4)
High incident score	0.4019***			
	(0.1105)			
Incident score		−0.0008		
		(0.0013)		
Number of incidents			0.1488*	
			(0.0700)	
Short-term incident score				0.0074***
				(0.0021)
Total book assets	0.1179***	0.1223***	0.1032***	0.1075***
	(0.0202)	(0.0208)	(0.0193)	(0.0175)
Book-to-market$_{FY}$	0.0013	0.0010	0.0018	−0.0011
	(0.0040)	(0.0042)	(0.0037)	(0.0041)
Return on assets	−0.0833	−0.0853	−0.0396	−0.0810
	(0.0815)	(0.0855)	(0.0779)	(0.0684)
Dividends	0.0810	0.0861	0.0742	0.0153
	(0.1273)	(0.1285)	(0.1214)	(0.0832)
Cash	0.2592**	0.2754**	0.2223**	0.2360***
	(0.0830)	(0.0839)	(0.0861)	(0.0657)
Leverage	0.0514	0.0482	0.0452	0.0535
	(0.0646)	(0.0659)	(0.0605)	(0.0530)
CAPEX	−0.1061	−0.0993	−0.0760	−0.0749
	(0.1375)	(0.1387)	(0.1325)	(0.1215)
CAPEX missing	−0.0281	−0.0706	−0.0670	−0.0027
	(0.1426)	(0.1641)	(0.1574)	(0.1485)
PPE	0.1335	0.1428	0.0979	0.0847
	(0.1054)	(0.1131)	(0.0975)	(0.0961)
PPE missing	−0.2655*	−0.2738*	−0.2159	−0.1894
	(0.1338)	(0.1412)	(0.1247)	(0.1176)
RD	0.0651	0.0731	0.0643	0.0458
	(0.1031)	(0.1054)	(0.0936)	(0.0828)
RD missing	0.0044	0.0072	0.0148	−0.0101
	(0.0542)	(0.0567)	(0.0537)	(0.0543)
Firm age	−0.0303	−0.0325	−0.0367	−0.0439**
	(0.0203)	(0.0247)	(0.0199)	(0.0169)
SP 500	0.1559***	0.1509***	0.1259***	0.1680***
	(0.0376)	(0.0386)	(0.0361)	(0.0405)
Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Firm FE	*Yes*	*Yes*	*Yes*	*Yes*
Observations	13,837	13,837	13,837	15,774
Adjusted R^2	0.7751	0.7726	0.7779	0.7682

Table IA4: ESG incident rates and future profitability with firm fixed effects

This table regresses return on assets (ROA) on lagged ESG incident measures and firm controls. The four ESG incident measures are the *High incident score*, *Incident score*, *Number of incidents*, and *Short-term incident score*. The dependent variable is winsorized at the 5% and 95% levels. All coefficients are multiplied by 100. Appendix A provides definitions for the variables. Robust standard errors double clustered at the firm level and year level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:			
	Return on assets in t+1			
	(1)	(2)	(3)	(4)
High incident score	0.692			
	(0.515)			
Incident score		-0.019^{***}		
		(0.006)		
Number of incidents			-0.345^{**}	
			(0.138)	
Short-term incident score				-0.013^{*}
				(0.007)
Total book assets	-1.830^{***}	-1.787^{***}	-1.795^{***}	-2.436^{***}
	(0.620)	(0.624)	(0.621)	(0.716)
Book-to-market$_{FY}$	-1.109^{***}	-1.110^{***}	-1.111^{***}	-1.248^{***}
	(0.371)	(0.371)	(0.372)	(0.424)
Leverage	-3.082^{**}	-3.084^{**}	-3.070^{**}	-2.319^{*}
	(1.434)	(1.433)	(1.425)	(1.374)
CAPEX	2.837	2.838	2.790	7.424
	(4.160)	(4.172)	(4.167)	(4.885)
CAPEX missing	0.221	0.136	0.145	−0.375
	(0.668)	(0.649)	(0.663)	(1.081)
PPE	-6.441^{**}	-6.395^{**}	-6.398^{**}	-6.826^{**}
	(3.231)	(3.219)	(3.216)	(2.788)
PPE missing	−4.536	−4.722	−4.672	−5.711
	(3.264)	(3.196)	(3.232)	(5.538)
RD	−9.362	−9.272	−9.329	-11.692^{*}
	(6.851)	(6.842)	(6.819)	(6.688)
RD missing	−0.947	−0.971	−0.949	−1.016
	(0.680)	(0.675)	(0.681)	(0.701)
Firm age	0.054	0.106	0.048	0.119
	(0.361)	(0.365)	(0.362)	(0.377)
SP 500	0.577	0.631^{*}	0.617^{*}	0.147
	(0.376)	(0.376)	(0.371)	(0.438)
Year FE	*Yes*	*Yes*	*Yes*	*Yes*
Firm FE	*Yes*	*Yes*	*Yes*	*Yes*
Observations	13,896	13,896	13,896	15,851
Adjusted R^2	0.632	0.632	0.632	0.594

Table IA5: ESG incident rates and future profitability using alternative profitability measures

This table regresses operating performance measures on lagged ESG incident measures and firm controls. One-year sales growth is the ratio of sales over sales from the previous fiscal year, net profit margin is the ratio of net income over sales, and return on equity is the ratio of net income over the sum of common equity and deferred taxes. The dependent variables are winsorized at the 5% and 95% levels. All coefficients are multiplied by 100. The controls are similar to the ones in Table 4. Robust standard errors double clustered at the firm level and year level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:											
	One-year sales growth in t+1				Net profit margin in t+1				Return on equity in t+1			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
High incident score	-2.744^{***}				-7.856^{***}				-4.085^{***}			
	(0.903)				(2.626)				(1.527)			
Incident score		-0.083^{***}				-0.156^{***}				-0.069^{***}		
		(0.022)				(0.032)				(0.016)		
Number of incidents			-0.066^{***}				-0.217^{***}				-0.086^{***}	
			(0.018)				(0.045)				(0.026)	
Short-term incident score				-1.259^{***}				-3.488^{***}				-1.275^{***}
				(0.385)				(0.723)				(0.348)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Industry-year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	13,751	13,751	15,681	13,751	13,896	13,896	15,851	13,896	13,756	13,756	15,691	13,756
Adjusted R^2	0.204	0.206	0.217	0.206	0.319	0.320	0.313	0.322	0.120	0.121	0.119	0.121

Table IA6: Descriptive statistics of the US portfolios

This table presents the number of firms and market capitalization of the three US portfolios used in this study. The portfolios are formed based on a firm's *Incident score*. The first column shows the dates on which the portfolios are formed. The remaining columns present the number of firms included in the portfolios (N), the portfolio's market capitalization in billions of US dollars (Mcap) and the portfolios' percentage market capitalizations as of total US stock market (%Mcap).

	Low incident score			Medium incident score			High incident score		
Date	N	Mcap	%Mcap	N	Mcap	%Mcap	N	Mcap	%Mcap
Jan 2009	1,328	2,780	24	407	4,471	38	33	1,616	14
Jan 2010	1,270	3,616	23	465	6,118	39	36	2,084	13
Jan 2011	1,205	4,015	20	528	7,563	38	38	2,823	14
Jan 2012	1,064	3,357	17	605	7,246	37	57	3,859	20
Jan 2013	996	3,705	17	647	8,043	36	58	4,486	20
Jan 2014	910	4,104	16	676	8,962	34	78	6,297	24
Jan 2015	815	3,797	13	740	9,770	34	95	7,672	26
Jan 2016	1,240	4,660	17	807	8,274	31	100	8,097	30
Jan 2017	1,194	5,497	17	765	10,411	33	90	8,425	26

Table IA7: Portfolio regressions with additional risk factors

This table presents monthly time-series regressions of the stock returns of a US portfolio with high ESG incident rates (an *Incident score* of above 50) on several risk factors. The first three columns show the results for the equal-weighted portfolio, and the last three columns show the results for the value-weighted portfolio. The first and fourth columns present the four-factor Carhart (1997) model. The second and fifth columns present the four-factor Carhart (1997) model extended by the Pástor and Stambaugh (2003) liquidity factor *LIQ* and the Frazzini and Pedersen (2014) betting-against-beta factor *BAB*. The third and sixth columns present the five-factor Fama and French (2015) model, which introduces the profitability factor *RMW* and the investment factor *CMA*. Standard errors calculated according to Newey and West (1987) are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:					
	Equal-weighted portfolio			Value-weighted portfolio		
	(1)	(2)	(3)	(4)	(5)	(6)
Constant	-0.0058^{***}	-0.0042^{**}	-0.0053^{***}	-0.0025^{**}	-0.0023^{**}	-0.0023^{**}
	(0.0017)	(0.0016)	(0.0018)	(0.0010)	(0.0011)	(0.0011)
MKT	1.2049^{***}	1.2053^{***}	1.2310^{***}	1.0502^{***}	1.0494^{***}	1.0306^{***}
	(0.0596)	(0.0441)	(0.0540)	(0.0230)	(0.0234)	(0.0210)
SMB	-0.2454^{***}	-0.3454^{***}	-0.2426^{***}	-0.4434^{***}	-0.4521^{***}	-0.4520^{***}
	(0.0759)	(0.0716)	(0.0736)	(0.0530)	(0.0567)	(0.0600)
HML	0.0691	0.0897	0.2643^{***}	0.1389^{***}	0.1376^{***}	0.1852^{***}
	(0.0507)	(0.0554)	(0.0973)	(0.0368)	(0.0388)	(0.0454)
MOM	-0.1741^{***}	-0.1536^{***}		0.0588^{**}	0.0619^{**}	
	(0.0322)	(0.0327)		(0.0256)	(0.0276)	
LIQ		0.1955^{***}			0.0142	
		(0.0603)			(0.0410)	
BAB		-0.1495^{**}			-0.0220	
		(0.0710)			(0.0539)	
RMW			-0.0742			-0.0656
			(0.0972)			(0.0764)
CMA			-0.2090			-0.0783
			(0.1942)			(0.1045)
Observations	108	108	108	108	108	108
Adjusted R^2	0.9122	0.9248	0.8920	0.9357	0.9347	0.9343

Table IA8: Fama-Macbeth stock-level regressions

This table presents the results of monthly regressions of raw stock returns on lagged variables of ESG incident measures and on a broad set of firm characteristics. The coefficients presented in the table are the averages of the cross-sectional coefficients. The four ESG incident measures are the *High incident score*, *Incident score*, *Number of incidents*, and *Short-term incident score*. The dependent variable is winsorized at the 1% and 99% levels. Appendix A provides definitions for the variables. Standard errors calculated according to Newey and West (1987) are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:			
	Stock return in t+2			
	(1)	(2)	(3)	(4)
High incident score	-0.003478^{***}			
	(0.001291)			
Incident score		-0.000065^{***}		
		(0.000019)		
Number of incidents			-0.001057^{***}	
			(0.000357)	
Short-term incident score				-0.000056^{*}
				(0.000033)
Market cap	0.001175	0.001343	0.001533	0.001595
	(0.001288)	(0.001267)	(0.001292)	(0.001113)
Book-to-market$_{CY}$	0.000219	0.000338	0.000408	-0.000139
	(0.000601)	(0.000596)	(0.000594)	(0.000557)
Dividend yield	0.000197	0.000291	0.000295	0.001171
	(0.000756)	(0.000777)	(0.000780)	(0.001069)
Returns t-3 to -2	0.011180^{**}	0.010911^{*}	0.010931^{**}	0.014492^{***}
	(0.005504)	(0.005509)	(0.005501)	(0.005128)
Returns t-6 to -4	0.002470	0.002293	0.002206	0.004219
	(0.003923)	(0.003954)	(0.003964)	(0.004386)
Returns t-12 to -7	0.006776^{*}	0.006616	0.006580	0.007280^{**}
	(0.004003)	(0.004009)	(0.003998)	(0.003661)
Dollar volume	-0.001217	-0.001170	-0.001220	-0.001540^{*}
	(0.000990)	(0.000985)	(0.000985)	(0.000868)
Stock price	-0.000605	-0.000544	-0.000483	-0.001173
	(0.000768)	(0.000768)	(0.000762)	(0.000733)
Idiosyncratic volatility	-0.000328	-0.000301	-0.000278	-0.000208
	(0.000309)	(0.000308)	(0.000305)	(0.000340)
Investment	-0.001233^{*}	-0.001283^{*}	-0.001284^{*}	-0.000909
	(0.000688)	(0.000692)	(0.000686)	(0.000611)
Profitability	0.007176^{**}	0.007341^{**}	0.007295^{**}	0.007460^{***}
	(0.003078)	(0.003077)	(0.003079)	(0.002781)
Observations	161,757	161,757	161,757	194,433

Table IA9: Stock-level regressions with industry-adjusted returns

This table presents the results of OLS panel regressions of industry-adjusted stock returns on lagged ESG incident measures and controls. I calculate industry-adjusted returns by deducting the returns of the value-weighted 48-industry portfolios of Fama and French (1997) from the raw stock returns. The dependent variable is winsorized at the 1% and 99% levels. Standard errors double-clustered at the firm level and month level are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:			
	Industry-adjusted stock return in t+2			
	(1)	(2)	(3)	(4)
High incident score	−0.002132			
	(0.001324)			
Incident score		−0.000069***		
		(0.000023)		
Number of incidents			−0.000855**	
			(0.000431)	
Short-term incident score				−0.000067**
				(0.000029)
Market cap	0.001647	0.001884	0.001973*	0.001787*
	(0.001145)	(0.001145)	(0.001114)	(0.000984)
Book-to-market$_{CY}$	0.000710	0.000882	0.000911	0.000731
	(0.000586)	(0.000578)	(0.000590)	(0.000509)
Dividend yield	−0.000113	−0.000105	−0.000095	−0.000073
	(0.000087)	(0.000086)	(0.000084)	(0.000080)
Returns t-3 to -2	−0.000449	−0.000722	−0.000715	0.004339
	(0.008078)	(0.008081)	(0.008080)	(0.006958)
Returns t-6 to -4	−0.005396	−0.005670	−0.005663	−0.005231
	(0.007983)	(0.007997)	(0.008009)	(0.006958)
Returns t-12 to -7	−0.000211	−0.000442	−0.000414	0.000963
	(0.004855)	(0.004859)	(0.004871)	(0.004326)
Dollar volume	−0.001297	−0.001257	−0.001296	−0.001460*
	(0.000938)	(0.000941)	(0.000938)	(0.000835)
Stock price	−0.000556	−0.000458	−0.000434	−0.001238
	(0.000830)	(0.000827)	(0.000830)	(0.000766)
Idiosyncratic volatility	−0.000373	−0.000356	−0.000346	−0.000492
	(0.000375)	(0.000373)	(0.000369)	(0.000357)
Investment	0.000186	0.000179	0.000182	−0.000026
	(0.000270)	(0.000272)	(0.000272)	(0.000153)
Profitability	0.005273**	0.005474**	0.005425**	0.004701**
	(0.002291)	(0.002294)	(0.002303)	(0.001900)
Month FE	*Yes*	*Yes*	*Yes*	*Yes*
Observations	157,595	157,595	157,595	190,266
Adjusted R^2	0.020813	0.020893	0.020855	0.019299

Table IA10: Stock-level regressions with ISS governance controls

This table presents the results of OLS panel regressions of raw stock returns on lagged variables of ESG incident measures, corporate governance variables, a broad set of firm characteristics, and month fixed effects. The corporate governance variables are a dummy indicating whether the CEO is also the Chair of the board (*Dual CEO-Chair*) and the entrenchment index (*E-Index*) from Bebchuk, Cohen, and Ferrell (2009). The dependent variable is winsorized at the 1% and 99% levels. The control variables are similar to those in Table 8. Standard errors double clustered at the firm level and month level are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:							
	Stock return in t+2							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High incident score	−0.001608	−0.001805						
	(0.001972)	(0.001971)						
Incident score			−0.000054*	−0.000056*				
			(0.000028)	(0.000029)				
Number of incidents					−0.000469	−0.000536		
					(0.000517)	(0.000516)		
Short-term incident score							−0.000028	−0.000030
							(0.000033)	(0.000033)
Dual CEO-Chair		0.001414**		0.001450**		0.001452**		0.001301**
		(0.000671)		(0.000671)		(0.000665)		(0.000575)
E-index		−0.000125		−0.000140		−0.000131		0.000232
		(0.000334)		(0.000335)		(0.000334)		(0.000309)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	89,482	89,482	89,482	89,482	89,482	89,482	106,835	106,835
Adjusted R^2	0.242355	0.242389	0.242402	0.242438	0.242362	0.242399	0.257261	0.257289

Table IA11: Stock-level regressions with different ESG dimensions

This table regresses raw stock returns on lagged ESG incident measures and controls. Panel A shows the results for *High incident score*, Panel B shows the *Incident score*, Panel C shows the *Number of incidents*, and Panel D shows the *Short-term incident score*. *Environmental*, *Social*, and *Governance* are dummies that take the value of one when a company's incident exposure is above 50% in one of the three ESG dimensions. The dependent variable is winsorized at the 1% and 99% levels. The control variables are similar to those in Table 8. Appendix A provides definitions of the variables. Standard errors double clustered at the firm level and month level are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

Panel A: High incident score

	Dependent variable:				
	Stock return in t+2				
	(1)	(2)	(3)	(4)	(5)
High incident score	−0.003233*	−0.002300	−0.002993*	−0.005395***	−0.004478**
	(0.001667)	(0.001670)	(0.001755)	(0.001928)	(0.002191)
High incident score x Environmental		−0.009380**			−0.007173
		(0.004288)			(0.004545)
High incident score x Social			−0.000948		0.000413
			(0.002650)		(0.002890)
High incident score x Governance				0.006557**	0.005621**
				(0.002523)	(0.002603)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	161,757	161,757	161,757	161,757	161,757
Adjusted R^2	0.191007	0.191025	0.191002	0.191030	0.191033

Panel B: Incident score

	Dependent variable:				
	Stock return in t+2				
	(1)	(2)	(3)	(4)	(5)
Incident score	−0.000078***	−0.000066**	−0.000084***	−0.000087***	−0.000075**
	(0.000028)	(0.000028)	(0.000029)	(0.000031)	(0.000032)
Incident score x Environmental		−0.000114*			−0.000106*
		(0.000060)			(0.000054)
Incident score x Social			0.000019		0.000011
			(0.000029)		(0.000030)
Incident score x Governance				0.000027	0.000015
				(0.000039)	(0.000039)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	161,757	161,757	161,757	161,757	161,757
Adjusted R^2	0.191075	0.191132	0.191074	0.191078	0.191124

Table IA11: Stock-level regressions with different ESG dimensions (contd.)

Panel C: Number of incidents

	Dependent variable:				
	Stock return in t+2				
	(1)	(2)	(3)	(4)	(5)
Number of incidents	−0.001167**	−0.000902*	−0.001294**	−0.001353**	−0.001181*
	(0.000537)	(0.000530)	(0.000561)	(0.000586)	(0.000605)
Number of incidents x Environmental		−0.001975**			−0.001700**
		(0.000922)			(0.000809)
Number of incidents x Social			0.000444		0.000363
			(0.000477)		(0.000491)
Number of incidents x Governance				0.000673	0.000501
				(0.000688)	(0.000686)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	161,757	161,757	161,757	161,757	161,757
Adjusted R^2	0.191060	0.191129	0.191062	0.191072	0.191127

Panel D: Short-term incident score

	Dependent variable:				
	Stock return in t+2				
	(1)	(2)	(3)	(4)	(5)
Short-term incident score	−0.000065*	−0.000043	−0.000072*	−0.000084**	−0.000057
	(0.000036)	(0.000036)	(0.000038)	(0.000042)	(0.000045)
Short-term incident score x Environmental		−0.000184**			−0.000171***
		(0.000075)			(0.000065)
Short-term incident score x Social			0.000024		0.000009
			(0.000042)		(0.000044)
Short-term incident score x Governance				0.000057	0.000030
				(0.000054)	(0.000055)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Month FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	194,433	194,433	194,433	194,433	194,433
Adjusted R^2	0.205890	0.205950	0.205888	0.205898	0.205944

Table IA12: Portfolio with high ESG incident rates and no short-selling constraints

This table presents monthly time-series regressions of the stock returns of a US portfolio with a high *Incident score* on several risk factors. The portfolio includes only stocks with high incident scores that are not subject to short-selling constraints (i.e., institutional ownership is higher than 25%, stock price is higher than $5, *and* market capitalization is higher than $1 billion). The first and second columns show the equal-weighted portfolio alpha estimated with the four-factor US model and with the eight-factor world model, and the third and fourth columns show the value-weighted portfolio alpha estimated with the four-factor US model and with the eight-factor world model. Standard errors calculated according to Newey and West (1987) are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:			
	Equal-weighted portfolio		Value-weighted portfolio	
	(1)	(2)	(3)	(4)
Constant	-0.0031^{**}	-0.0021^{**}	-0.0018^{*}	-0.0024^{**}
	(0.0013)	(0.0010)	(0.0010)	(0.0012)
MKT	1.1236^{***}	0.7327^{***}	1.0070^{***}	1.0188^{***}
	(0.0485)	(0.1896)	(0.0251)	(0.1477)
SMB	-0.2304^{***}	-0.1984^{**}	-0.4559^{***}	-0.5468^{***}
	(0.0790)	(0.0929)	(0.0591)	(0.0942)
HML	0.1292^{***}	0.3599^{***}	0.1551^{***}	0.2687^{***}
	(0.0419)	(0.1257)	(0.0426)	(0.1019)
MOM	-0.1074^{***}	-0.0676	0.0626^{*}	0.0437
	(0.0320)	(0.0740)	(0.0320)	(0.0589)
WMKT		0.3767^{*}		0.0119
		(0.1966)		(0.1311)
WSMB		0.0140		0.1958
		(0.1690)		(0.1377)
WHML		-0.3315^{*}		-0.1716
		(0.1897)		(0.1525)
WMOM		-0.0117		0.0409
		(0.0980)		(0.0685)
Observations	108	108	108	108
Adjusted R^2	0.9173	0.9218	0.9268	0.9282

Table IA13: ESG incident rates and analysts' short- and long-horizon forecast errors

This table regresses analysts' forecast errors on lagged ESG incident rates and firm controls. Columns 1 to 4 look at the one-year-ahead median forecast error, defined as the difference between the actual earnings and the analyst consensus measured 8 months before, scaled by the stock price at the end of the fiscal year. Columns 5 to 8 look at the two-year-ahead median forecast error, which compares actual earnings and the analyst consensus measured 20 months before. Columns 9 to 12 is the difference between the two-year-ahead and the one-year-ahead median forecast error. Forecast errors of larger than 10% of the stock price are deleted. The control variables are the same as in Table 9. All coefficients are multiplied by 100. Standard errors double clustered at the firm level and year level are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:											
	Forecast error 1-FY				Forecast error 2-FY				Diff(Forecast error)			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
High incident score	-0.248^{*}				-0.541^{***}				-0.289^{**}			
	(0.134)				(0.193)				(0.125)			
Incident score		−0.002				−0.001				0.001		
		(0.002)				(0.002)				(0.002)		
Number of incidents			-0.051^{**}				-0.101^{**}				−0.050	
			(0.024)				(0.043)				(0.033)	
Short-term incident score				-0.005^{***}				-0.007^{***}				−0.002
				(0.002)				(0.002)				(0.003)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Industry-year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	8,573	8,573	8,573	9,754	8,573	8,573	8,573	9,754	8,573	8,573	8,573	9,754
Adjusted R^2	0.061	0.061	0.061	0.063	0.102	0.101	0.101	0.121	0.073	0.073	0.073	0.094

Table IA14: ESG incident rates and future profitability—customer awareness subsamples

This table regresses ROA on lagged ESG incident measures and firm controls within subsamples of low and high customer awareness. I measure customer awareness by advertising intensity (advertisement expenses divided by total book assets). The four ESG incident measures are the *High incident score*, *Incident score*, *Number of incidents*, and *Short-term incident score*. The dependent variable is winsorized at the 5% and 95% levels. All coefficients are multiplied by 100. The control variables are similar to those in Table 4. Appendix A provides definitions for the variables. Robust standard errors double clustered at the firm level and year level are reported in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:							
	Return on assets in t+1							
	Low	High	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
High incident score	-3.847^{***}	-1.945^{**}						
	(0.956)	(0.818)						
Incident score			-0.062^{***}	-0.034^{**}				
			(0.011)	(0.017)				
Number of incidents					-1.508^{***}	-0.590^{*}		
					(0.233)	(0.323)		
Short-term incident score							-0.089^{***}	-0.035^{*}
							(0.016)	(0.021)
Controls	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Industry-year FE	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*	*Yes*
Observations	8,210	5,686	8,210	5,686	8,210	5,686	9,326	6,525
Adjusted R^2	0.345	0.186	0.348	0.187	0.352	0.187	0.333	0.183

Table IA15: ESG incident rates and insider trading

This table regresses *Net insider purchases* on ESG incident measures and firm controls. The dependent variable is calculated as the value of insider's net purchases (directly held securities traded at open markets) divided by a firm's market capitalization measured at the end of the previous calendar year. Appendix A provides definitions of the variables. All coefficients are multiplied by 100. Standard errors double clustered at the firm level and year level are presented in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels, respectively.

	Dependent variable:			
	Net insider purchases			
	(1)	(2)	(3)	(4)
High incident score	0.333			
	(0.281)			
Incident score		0.013		
		(0.009)		
Number of incidents			0.245**	
			(0.107)	
Short-term incident score				0.024***
				(0.004)
Total book assets	−0.127**	−0.168**	−0.198**	−0.201***
	(0.064)	(0.070)	(0.079)	(0.060)
Book-to-market$_{FY}$	−0.009	−0.009	−0.009	−0.009
	(0.010)	(0.010)	(0.010)	(0.010)
Leverage	−0.622*	−0.630*	−0.608*	−0.756**
	(0.336)	(0.333)	(0.328)	(0.339)
CAPEX	−0.691	−0.686	−0.697	−1.236
	(1.191)	(1.181)	(1.185)	(1.172)
CAPEX missing	0.575**	0.590*	0.563*	0.765***
	(0.287)	(0.305)	(0.292)	(0.278)
PPE	2.731***	2.725***	2.729***	2.616***
	(0.875)	(0.878)	(0.877)	(0.814)
PPE missing	1.451	1.516	1.570	1.370
	(1.153)	(1.114)	(1.124)	(1.049)
RD	2.079***	2.016***	1.957***	2.191***
	(0.757)	(0.730)	(0.704)	(0.782)
RD missing	−0.445	−0.438	−0.422	−0.349
	(0.420)	(0.427)	(0.428)	(0.394)
Firm age	1.077***	1.067***	1.066***	1.046***
	(0.141)	(0.138)	(0.139)	(0.121)
SP 500	0.245	0.198	0.156	0.243
	(0.170)	(0.177)	(0.175)	(0.161)
Industry-year FE	*Yes*	*Yes*	*Yes*	*Yes*
Observations	16,408	16,408	16,408	18,421
Adjusted R^2	0.061	0.061	0.061	0.058