

Who Uses Corporate Sustainability Reports?

Suzanne Burzillo

University of Southern California

Matthew Shaffer

University of Southern California

Richard Sloan*

University of Southern California

April 27, 2022

Abstract

Recent years have witnessed growing interest in corporate sustainability reporting. Yet existing research provides mixed and indirect evidence on the information content of such reports to investors. We examine the stock market reaction to the release of corporate sustainability reports. Our examination focuses on reports incorporating SASB metrics that are intended to provide financially material and decision useful information to investors. Using standard measures of information content, we are unable to find compelling evidence that sustainability reports provide a significant amount of decision-useful information to investors. Further tests suggest that the information provided in the reports is either financially immaterial or preempted by traditional financial disclosures. We conclude that sustainability information is demanded by a broad set of stakeholders who are concerned with environmental and social impacts and that a narrow focus on financial materiality to investors is unnecessarily restrictive.

Keywords: Sustainability; Disclosure; Materiality

JEL: G1; M4

*Burzillo (suzanne.burzillo@marshall.usc.edu) is a doctoral student at the University of Southern California. Shaffer (matthew.shaffer@marshall.usc.edu) is an assistant professor at the University of Southern California. Sloan (sloanr@marshall.usc.edu) is the Deloitte and Touche LLP Chair in Accounting and Professor of Accounting, Finance and Business Economics at the University of Southern California. Sloan is a member of the SASB Alliance and a holder of the SASB's FSA Credential. Sloan serves on the Academic Advisory Board of Strategic Global Advisors, an institutional asset management firm, and is a member of the Financial Accounting Standards Advisory Council. We appreciate the comments of workshop participants at the USC Leventhal School Brown Bag Seminar and the data collection assistance of Emma Sloan. We also thank the Corporate Research Project of Good Jobs First for the provision of their Violation Tracker database. The views expressed here are those of the authors alone.

“In (a free) economy, there is one and only one social responsibility of business—to use its resources and engage in activities designed to increase its profits so long as it stays within the rules of the game, which is to say, engages in open and free competition without deception or fraud”

-Milton Friedman, *Capitalism and Freedom*, 1962 ([Friedman, 1962](#))

“Environmental governance depends on good, trustworthy information about stocks, flows, and processes within the resource systems being governed, as well as about the human-environment interactions affecting those systems”

-Thomas Dietz, Elinor Ostrom and Paul Stern, *The Struggle to Govern the Commons*, 2003 ([Dietz, Ostrom, and Stern, 2003](#))

1 Introduction

Recent years have witnessed a surge in corporate sustainability reporting. Annual surveys released by The Governance and Accountability Institute indicate that 92% of S&P 500 companies issued sustainability reports in 2020, up from just 20% in 2011.¹ While such reports are not currently mandated in the US, they have been encouraged by large institutional investors. For example, in his 2020 annual letter to corporate CEOs, Blackrock CEO Larry Fink asked all investee companies to publish disclosures consistent with guidelines issued by the Sustainability Accounting Standards Board (SASB). Fink further noted that Blackrock would use these disclosures to ascertain whether companies are properly managing and overseeing their risks.² More recently, the IFRS Foundation has established an International Sustainability Standard Board (ISSB) to develop standards that meet investors’ information needs.³ The Securities and Exchange Commission (SEC) has also proposed rule changes that would require registrants to include certain climate-related disclosures in their registration statements and periodic reports, including information about climate-related

¹<https://www.ga-institute.com/research/ga-research-collection/sustainability-reporting-trends/2021-sustainability-reporting-in-focus.html>

²<https://www.blackrock.com/corporate/investor-relations/2020-larry-fink-ceo-letter>

³<https://www.ifrs.org/news-and-events/news/2021/11/ifrs-foundation-announces-issb-consolidation-with-cdsb-vrf-publication-of-prototypes/>

risks that are reasonably likely to be financially material.⁴ Meanwhile, Commissioner Hester Peirce indicated that she could not support the proposal because the disclosure of financially material climate risks is already required by existing SEC rules.⁵

Despite the practical importance of this topic, academic research investigating whether such disclosures are useful to investors in determining enterprise value provides mixed and indirect results. Several studies document a link between sustainability reports and the cost of capital and/or firm value (e.g., [Dhaliwal, Li, Tsang, and Yang \(2011\)](#), [Plumlee, Brown, Hayes, and Marshall \(2015\)](#), [Barth, Cahan, Chen, and Venter \(2017\)](#)). Another line of research investigates whether good corporate performance on material sustainability issues leads to higher future stock returns, providing mixed results (e.g., [Khan, Serafeim, and Yoon \(2016\)](#), [Berchicci and King \(2021\)](#)). Most directly related to this paper is research examining the stock price reaction to sustainability-related news releases. This research finds some evidence that stock prices respond to good and bad news about sustainability issues reported by information intermediaries, such as the business press (e.g., [Capelle-Blancard and Petit \(2019\)](#); [Serafeim and Yoon \(2021\)](#)). On the other hand, this research finds mixed results on the information content of corporate sustainability news releases. For example, [Griffin and Sun \(2013\)](#) document a positive stock price response to corporate press releases involving greenhouse gas omissions. In contrast, [Capelle-Blancard and Petit \(2019\)](#) classify corporate sustainability news releases into good news and bad news and find no evidence of a systematic stock price reaction on the publication date.

We contribute to previous research by providing a direct assessment of the information content of corporate sustainability reports. Our research design closely follows the approach pioneered by [Beaver \(1968\)](#) to assess the information content of earnings reports. In particular, we test for evidence of higher stock price volatility and higher trading volume around the release of corporate sustainability reports. Our research design also contains several features that are intended to improve test power and specification. First, we restrict our analysis to sustainability reports that incorporate SASB metrics. These metrics are designed to elicit industry-specific information that

⁴<https://www.sec.gov/news/press-release/2022-46>

⁵<https://www.sec.gov/news/statement/peirce-climate-disclosure-20220321>

is both financially material and decision useful. Recent research suggests that they are successful in doing so (see, for example, [Grewal, Hauptmann, and Serafeim \(2021\)](#), [Schiehl and Kollahgar \(2021\)](#), and [Spandel, Schiemann, and Hoepner \(2020\)](#)). Second, we limit our sample to reports that are announced via a press release or similar company announcement. Third, we restrict our analysis to stand-alone sustainability reports, as opposed to integrated reports that combine the release of traditional financial statement metrics with sustainability metrics. Fourth, we restrict our analysis to release dates that do not overlap with traditional financial reports. Together, these features of our research design isolate the financial information content of sustainability data.

Perhaps surprisingly, we are unable to find compelling evidence that sustainability reports provide a significant amount of decision-useful information to investors. The results for sustainability reports stand in stark contrast to the results for earnings reports. For example, we find that stock price volatility is 8% higher than usual around sustainability announcements, an amount that is insignificantly different from zero. In contrast, we find that stock price volatility is 213% higher around quarterly earnings announcements, an amount that is highly significantly different from zero. We find qualitatively similar results using trading volume. Thus, we conclude that corporate sustainability reports do not appear to provide investors with a significant amount of decision-useful information.

In order to better understand our results, we conduct additional tests to discriminate between different explanations for the low information content of sustainability reports. We find no evidence of a delayed repose to information in sustainability reports. Instead, we find that the information contained in such reports is typically financially immaterial. Moreover, in the limited number of cases where it is financially material, we find that it is preempted by other required disclosure documents, such as Form 8-K and From 10-K.

It is important note that our study focuses on the financial materiality of information in sustainability reports to investors. This focus aligns with numerous prominent organizations in the sustainability reporting ecosystem, including the SASB, the Task Force on Climate-related Financial Disclosures (TCFD) and the ISSB. In contrast, other prominent organizations, including the

European Commission and the Global Reporting Initiative (GRI), have adopted a double materiality perspective. The double materiality perspective incorporates both financial materiality and environmental and social materiality. Under the double materiality perspective, companies should disclose their material environmental and social impacts even when they do not have financially material consequences for firm value. In the absence of significant financial penalties for negative environmental and social impacts, it is possible for a firm to have material environmental and social impacts without accompanying material financial impacts for investors.

While our research design speaks to the financial materiality of sustainability reports, it does not speak to their environmental and social materiality. This limitation is important for two reasons. First, while some investors may use sustainability information solely for financial considerations, others may seek to allocate capital to minimize negative environmental and social impacts.⁶ Second, other stakeholders, including customers, employees, suppliers, regulators, communities and civil society are also likely to consider material environmental and social impacts in making decisions involving the reporting company.

Establishing whether sustainability reports should have a narrow focus on financial materiality or whether they should broaden their scope to encompass environmental and social materiality is a critical issue. The focus on financial materiality aligns with traditional financial reporting frameworks that seeks to provide decision-useful information to investors. This focus, in turn, is reflected in the [Friedman \(1962\)](#) quote at the beginning of this section that the social responsibility of business is to increase profits. Yet other stakeholders demand sustainability information to shape the terms on which they transact with a business, such that sustainability reports can directly impact profits. These stakeholders seek to minimize environmental and social impacts and may refuse to engage with companies that fail to provide full and transparent sustainability disclosures. This

⁶A recent example illustrating this distinction is the November 2020 Department of Labour ruling requiring fiduciaries to select ESG funds based solely on financial considerations. See <https://www.federalregister.gov/documents/2020/11/13/2020-24515/financial-factors-in-selecting-plan-investments>. The Biden administration has since indicated that it will not enforce this ruling (see <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/05/20/executive-order-on-climate-related-financial-risk/>) and the Department of Labor has proposed a new ruling removing barriers to considering ESG factors in fund selection (see <https://www.dol.gov/newsroom/releases/ebsa/ebsa20211013>).

alternative role of sustainability reports is reflected in the [Dietz et al. \(2003\)](#) quote at the beginning of this section that effective environmental governance depends on good, trustworthy information.

Our findings should be of broad interest to parties involved in the production and use of sustainability reports. First, our results should be of interest to sustainability standard setters in establishing the objectives of the standards. Several existing standard-setting frameworks, including those of the SASB and TCFD, and the proposal by ISSB, focus on providing financially material information to investors. We are unable to find compelling evidence that such frameworks provide a significant amount of decision-useful information to investors. Moreover, existing standard-setting frameworks already focus on providing financially material information to investors. Given that other stakeholders demand sustainability information to assess environmental and social impacts, a broader focus on standards that provide such information would seem to better meet the demands of users. Such a focus is already adopted in the standards issued by the GRI and the sustainability disclosure requirements of the European Commission.

Second, our findings should be of interest to corporate reporters who incur costs in preparing and disseminating sustainability reports. By providing evidence on their usefulness to investors, our results should assist in determining the nature and amount of such disclosure. Third, our results should be of interest to users, including investors and creditors, who stand to benefit from the disclosure of information that is incrementally value relevant. Finally, our results should be of interest to regulators such as the SEC and the European Securities and Markets Authority (ESMA) that are charged with overseeing the disclosure of financially material information to investors in public capital markets.

The remainder of the paper proceeds as follows. The next section reviews prior research and develops our hypotheses. [Section 3](#) describes our research design, including data sources, sample construction, variable measurement and empirical tests. [Section 4](#) presents our results and [Section 5](#) concludes.

2 Background, Prior Literature and Hypothesis Development

Recent years have seen rapid growth in the academic literature focused on corporate sustainability reporting (see [Christensen, Hail, and Leuz \(2021\)](#) for a recent review of this literature). Yet despite the practical importance of this topic, findings on whether such disclosures are useful to investors in determining company value are mixed and indirect. Several studies find a link between sustainability reports and the cost of capital and/or firm value. For example, [Dhaliwal et al. \(2011\)](#) finds that firms initiating voluntary disclosure of corporate social responsibility activities and having superior social responsibility performance experience a subsequent reduction in the cost of equity capital, an increase in dedicated institutional investors, an increase in analyst coverage and an increase in analyst forecast accuracy. Subsequent research by [Plumlee et al. \(2015\)](#) and [Barth et al. \(2017\)](#) also finds evidence of a relationship between the quality of sustainability disclosures and firm value.

Another line of research investigates whether good corporate performance on material sustainability is associated with higher future stock returns. Early research was unable to find a robust relation (e.g., [Renneboog, Ter Horst, and Zhang \(2008\)](#)). More recently, [Khan et al. \(2016\)](#) find a positive relation between performance on material sustainability issues and future stock returns. The key innovation in [Khan et al. \(2016\)](#) is to identify material sustainability issues using the SASB's materiality map. However, a recent paper by [Berchicci and King \(2021\)](#) finds that the results in [Khan et al. \(2016\)](#) are not robust to other reasonable empirical assumptions and model specifications. They conclude that the results in [Khan et al. \(2016\)](#) are probably a statistical artifact.

Most directly related to this paper is research examining the stock price reaction to sustainability-related news releases. This research finds mixed results on the stock price responses to news about sustainability issues reported by companies, the business press and other information intermediaries. [Griffin and Sun \(2013\)](#) and [Griffin, Lont, and Sun \(2017\)](#) find that the stock market responds to voluntary corporate disclosures relating to greenhouse gas emissions. [Naughton, Wang, and Yeung \(2019\)](#) find that firms' announcements of CSR activities generate positive abnormal returns

during periods when investors place a valuation premium on CSR performance. [Giorgino, Supino, and Barnabè \(2017\)](#) find that the release of integrated reports following the International Integrated Reporting Committee (IIRC) framework has a significant impact on stock prices. Note that since such reports also contain traditional financial statement information, the results cannot be uniquely attributed to sustainability disclosures. [Capelle-Blancard and Petit \(2019\)](#) classify sustainability news releases into good news and bad news. They find evidence of a negative reaction to bad news releases by the media, but they do not find evidence of systematic stock price reaction to good and bad news releases by firms or NGOs. [Krüger \(2015\)](#) also finds evidence of a negative reaction to bad sustainability news released by the media and additionally finds a weak negative response to good news. More recently, [Serafeim and Yoon \(2021\)](#) examine the stock price response to sustainability news issued by the media. They further classify news releases into financially material and financially immaterial using the SASB's materiality map. They find evidence of significant positive stock price reactions for good news that is financially material.

Finally, a number of papers have either directly or indirectly analyzed the SASB reporting framework. For example, [Busco, Consolandi, Eccles, and Sofra \(2020\)](#) analyze a sample of companies reporting using SASB standards and find the quality of the reporting to be "good to very good." Several studies also find that the SASB's financial materiality mapping can be used to improve the assessment of sustainability performance. Examples include [Khan et al. \(2016\)](#), [Spandel et al. \(2020\)](#) and [Madison and Schiehl \(2021\)](#). Finally studies by [Grewal et al. \(2021\)](#) and [Schiehl and Kollahgar \(2021\)](#) find that the disclosure of SASB-classified financially material sustainability metrics is associated with increased stock price informativeness. Thus, this research generally corroborates the value relevance and decision usefulness of SASB metrics.

In summary, evidence on the value relevance of sustainability disclosures is mixed, with some evidence suggesting that metrics identified as material by the SASB are more value relevant. To our knowledge, we are the first to directly examine the stock price impact around the announcement of standalone corporate sustainability reports containing SASB metrics.

2.1 Hypothesis Development

Our primary purpose is to determine whether corporate sustainability reports convey incrementally value relevant information to investors. We emphasize at the outset that corporate sustainability reporting also seeks to fulfill other objectives. This is reflected in the double materiality perspective adopted by the European Commission in its Non Financial Reporting Directive, whereby disclosure choices should be influenced by both financial materiality and environmental and social materiality ([European Commission \(2019\)](#), p.4).

Financial materiality encompasses sustainability metrics that are useful in determining firm value and is the primary focus of numerous organizations providing sustainability disclosure guidance, including the SASB, the TCFD and the ISSB. For example, the SASB's three objectives are to identify information that is (i) financially material, (ii) decision useful and (iii) cost effective. The SASB defines information to be financially material if omitting, misstating, or obscuring it could reasonably be expected to influence investment or lending decisions ([SASB \(2020\)](#), p.7). In order to focus on sustainability reports that provide financially material information, we restrict our analysis to reports incorporating SASB metrics.

Environmental and social materiality encompasses how corporations contribute to the improvement or deterioration of environmental and social conditions. Such information is of interest to citizens, consumers, employees, business partners, communities and civil society organisations ([European Commission \(2019\)](#), p.4). Material environmental and social impacts do not necessarily translate into material financial impacts. Thus, our evidence does not speak to the environmental and social materiality of sustainability reports. We note that while the SASB and the TCFD focus on financial materiality, other organizations providing sustainability disclosure guidance also incorporate environmental and social materiality. For example, the GRI defines material topics as those that represent the reporting organization's most significant impacts on the economy, environment and people, including impacts on their human rights. ([Global Reporting Initiative, 2022](#)).

Given our focus on financial materiality, we employ the standard procedure for assessing the information content of financial reports pioneered by [Beaver \(1968\)](#). This procedure involves test-

ing for a stock price impact when the information is released to the market:

Prediction 1: *The release of a corporate sustainability report containing SASB metrics is associated with a significant stock price reaction.*

Note that following [Beaver \(1968\)](#), we are agnostic as to the direction of the stock price reaction. That is, we do not seek to classify reports into ‘good news’ and ‘bad news’ in the vein of [Ball and Brown \(1968\)](#). Instead, we seek to determine whether the stock price volatility on report release days is higher than on other days.

Even if information in a report does not have a significant impact on firm value, it could provide information on the characteristics of a security that affect its investor clientele. For example, a report identifying a reduction in a firm’s risk profile could make it more attractive to risk averse investors and less attractive to risk seeking investors. This would lead to an increase in trading volume, as risk seeking investors trade with risk averse investors. Thus, following [Beaver \(1968\)](#), we also test for abnormal trading volume around report release dates.

Prediction 2: *The release of a corporate sustainability report containing SASB metrics is associated with abnormally high trading volume.*

Finally, in order to calibrate our findings, we compare the magnitudes of the price and volume impacts of sustainability reports to the corresponding impacts of quarterly earnings reports. Following [Beaver \(1968\)](#), a long literature shows that earnings announcements have significant price and volume impacts. Moreover, recent research shows that these impacts have significantly increased in recent years ([Beaver, McNichols, and Wang, 2018](#)). Given that financial reports are specifically designed to provide financially material and decision useful information to investors, we do not expect the supplemental information in corporate sustainability reports to be as informative. Nevertheless, standard financial reports are issued every quarter, while sustainability reports are typically released only annually. This allows more time for the accumulation of any financially material sustainability information. By comparing the price and volume reactions of the two sets of reports, we can calibrate the relative information content of sustainability reports.

Prediction 3: *When compared to quarterly earnings reports, the release of corporate sustainability reports containing SASB metrics is associated with a relatively smaller stock price impact.*

Prediction 4: *When compared to quarterly earnings reports, the release of corporate sustainability reports containing SASB metrics is associated with relatively lower abnormal trading volume.*

3 Empirical Design

3.1 Sample Construction and Variable Measurement

Our research design requires us to construct a sample of corporate sustainability reports incorporating SASB metrics. We must also locate a concurrent press release or similar company announcement identifying the date of the report and ensure that this announcement date does not overlap with announcement dates for traditional financial statement information.

The SASB provides a regularly updated list of reports prepared using SASB standards on its website.⁷ This list contains links to the associated reports and provides additional information, including the country in which the company is domiciled, the type of report and the year in which the report was issued. As of September 2, 2021 the list contained links to 1,695 reports issued between 2015 and 2021. We start with this list and further restrict our analysis to companies domiciled in the United States. We make this choice for two reasons. First, the SEC currently requires little in the way of formal sustainability disclosures in the mandatory financial filings of US registrants. This allows us to cleanly separate the information content of sustainability reports from the information content of traditional financial filings. Second, the stock market data required for our empirical tests is readily available for US companies and has been widely studied in previous research.

We next manually search for the following information on each report:

⁷<https://www.sasb.org/company-use/sasb-reporters/>

-
- We search for a dated press release or similar announcement made by the company announcing the release of the report identified by the SASB link. Our default method is to use a Google search on the company name and the name and year of the report identified from the SASB link. We then scan the first page of search results for an announcement related to the report. For many cases, we are unable to locate an announcement. It is possible that an announcement was made, but was not uncovered by our search. Next, we carefully examine the wording in the announcements and only retain cases where the wording indicates that the announcement was issued concurrently with the report. For example, in most cases, the announcement will indicate that the report was issued 'today,' in which case we use the date of the announcement as the announcement date for the report.
 - We next eliminate any cases in which the report also incorporates the release of traditional financial statement information. For example, some firms provide SASB metrics in their Form 10-K filings or annual reports and we omit these reports from our analysis.
 - We next search the company's website and the SEC's EDGAR database to eliminate any observations with concurrent announcements of traditional financial statement data. We use a three day window centered on the announcement date to define the announcement period. Thus, any announcement made within two days of another announcement date will have an overlapping announcement window. We therefore eliminate any observation where a company issues a quarterly earnings announcement within a five day window centered on the report release date. We also eliminate observations where the company files a Form 10-K, a Form 10-Q or a Form 8-K provided pursuant to Item 2.02 (Results of Operations and Financial Condition) in this five day window. Note that we do not eliminate observations with announcements that do not pertain to traditional financial statement information. This could include new product announcements, proxy statements, management changes, etc. Our reasoning is that such announcements are equally likely on any trading day, and so eliminating observations with such announcements will bias against finding information content. Thus, each trading day is classified into one of three categories: (i) a trading day that is in the 3-day window surrounding the

announcement of a quarterly earnings report; (ii) a trading day that is in the 3-day window surrounding the announcement of a sustainability report and that has no overlapping announcements of traditional financial statement data in a 5-day window surrounding the announcement of the sustainability report; and (iii) all other trading days.

- Finally, we eliminate any observations that do not have the required stock return and trading volume data available on the CRSP daily files or quarterly earnings announcement data available from Compustat files.

Table 1 summarizes sample construction. Recall that we begin with a list of 1,695 reports identified by the SASB. From this list, we identify 846 unique reports issued by US companies. We are unable to view 90 of these reports, either due to no link being provided or due to the link being broken (i.e. the file was moved or removed). For an additional 244 reports, we are unable locate an associated press releases or related company announcement. Another 181 reports do have an identifiable release, but the language in the release suggests ambiguity as to when the report was first made available (e.g., the report was ‘recently released’ or the report ‘has been released’). Since it is critical that we identify the date that the report was released to the public, we only retain cases where the language indicates that the report was released on the same day as the associated announcement. We also lose a further 44 observations due to concurrent financial announcements and 11 observations due to insufficient CRSP data. This provides us with the final sample of 276 announcements.

Table 2 lists the final sample composition by the type of announcement that accompanies the release of the report. We are able to link 250 of the 276 announcements to a press release concurrently distributed via a newswire service (3 on Accesswire, 119 on Business Wire, 1 on CSR Newswire, 52 on Globe Newswire and 75 on PR Newswire). Of the remaining 26, 15 are identified as dated news releases on the company website, 11 are identified as other types of dated announcements on the company website (e.g., a blog) and 1 is only identified in a Form 8-K filing.

The difficulties we face in identifying press releases that are concurrent with the publication of the reports highlights that companies treat sustainability reports differently from traditional

disclosures of financially material information. Regulation FD requires that the release of material nonpublic information be made via a broad non-exclusionary distribution of the information to the public. This is typically accomplished through a concurrent press release that is carried by a major newswire service and/or a Form 8-K filing. Such methods of distribution are routine for earnings announcements. Yet for our sample of sustainability reports, there are many cases where we are unable to locate a press release or we can only locate a press release that is issued several days after the publication of the report on the company website. Moreover, we determine that only 15 of our final 276 observations file a Form 8-K disclosing the publication of the sustainability report. This pattern of behavior suggests that many managers do not consider the information in sustainability reports to be financially material to investors.

Table 3 provides summary statistics on key financial characteristics of our final sample vs. the corresponding Compustat universe, respectively, along with t-tests for differences in means. The Compustat universe consists of all observations from the Compustat Fundamentals Annual file from January 31, 2016 through October 31, 2021, for which Total Assets, Total Revenue, Total Equity, and Net Income are available. The companies in the SASB reporters sample are larger, more profitable and more highly levered. There are two likely reasons for these differences. First, the greater size of these companies provides them with economies of scale in the provision of sustainability reports. Second, the size and profitability of these companies means that they likely have both greater environmental and social impacts and greater visibility to a broad group of stakeholders.

Table 4 provides a comparison of the industry composition of our final sample of 276 observations relative to the broader Compustat population using the 48 Fama-French industry classifications. There are some obvious differences in the sample compositions. First, our sample of sustainability reporters is more heavily weighted to industries with material environmental and social impacts, such as Petroleum and Natural Gas, Utilities, Transportation, Machinery and Tobacco Products. Second, our sample is more heavily weighted to companies with high visibility to retail consumers including Food Products and Retail. Third, Trading is the most heavily repre-

sented industry in our sample. This industry includes investment managers, many of whom are in the business of providing ESG investment products. By publishing their own ESG reports, firms in this industry can signal their own commitment to sustainability.⁸

3.2 Variable Construction

Our primary predictions relate to stock price impact and abnormal trading volume around the announcement of corporate sustainability reports. We examine three market outcomes around the announcement date for our eligible firms. We describe these variables and their construction below:

1. $CAR_{t-1,t+1}$: The 3-day, market-model cumulative abnormal return around the report announcement date. Daily abnormal returns are calculated as the residual from regressing the firm's returns on the S&P500's returns from the 30 most recent trading days, inclusive, and are cumulated from $t - 1$ to $t + 1$.
2. *Abnormal Volatility*: The squared value of $CAR_{t-1,t+1}$ around the report announcement date divided by the average value for non announcement dates. This variable is defined so that its average value on non-announcement dates is 1. In computing the average value, we exclude the three-day trading windows around both SASB-report release dates and earnings release dates, and use a +/- 130-day window, following [Beaver, McNichols, and Wang \(2020\)](#).
3. *Abnormal Volume*: The mean of the trading volume (scaled by total shares outstanding) on each of the three days centered on the report announcement date, minus the mean scaled trading volume during the non-announcement period, divided by the standard deviation of the same. In computing the mean and standard deviation for this measure, we exclude the three-day trading windows around both SASB-report release dates and earnings release dates, and use a +/- 130-day window, following [Beaver et al. \(2020\)](#).

⁸A good example of this behavior is Blackrock, which was discussed in the introduction in relation to Larry Fink's letter to corporate CEOs requesting SASB-aligned disclosures. In making this request, Fink notes that Blackrock's SASB-aligned disclosures are available on its website. See <https://www.blackrock.com/corporate/investor-relations/2020-larry-fink-ceo-letter>.

Additionally, for both the *Abnormal Volatility* and *Abnormal Volume* measures, we have one more modification relative to Beaver et al. (2020), reflecting our sample constraints. As of this writing, daily market data is available for CRSP through 9/30/2021, whereas our SASB-report release dates run through 8/7/2021. Therefore, we do not require that observations have non-missing data for the full $t + 130$ window.

3.3 Hypothesis Testing

Our first prediction is that the release of a corporate sustainability report containing SASB metrics is associated with a significant stock price reaction. Following Beaver et al. (2020), we examine this prediction by testing whether *Abnormal Volatility* during the announcement window is significantly greater than one. Our second prediction is that the release of a corporate sustainability reports containing SASB metrics is associated with abnormally high trading volume. Following Beaver et al. (2020), we examine this prediction by testing whether *Abnormal Volume* during the announcement window is significantly greater than zero.

Our third and fourth predictions seek to compare the price and volume reactions around sustainability report announcement dates to the corresponding reactions around quarterly earnings report announcement dates. We examine these predictions by first replicating Predictions 1 and 2 using quarterly earnings announcement dates in place of sustainability report announcement dates. Next, we test whether the two sets of results are significantly different by conducting a t-test for difference in means between *Abnormal Volatility* and *Abnormal Volume* across the two samples.

4 Results

4.1 Information Content Tests

We begin by reporting the mean cumulative abnormal return during the three-day announcement window ($CAR_{t-1,t+1}$). We do not have a formal prediction for this variable, but since previ-

ous research has investigated the mean stock price response to corporate sustainability announcements, we report this variable for completeness.

Column (1) of Table 5 reports the mean value of $CAR_{t-1,t+1}$ along with its 95% confidence interval and p-value for a two-sided test against a null hypothesis of zero. The average $CAR_{t-1,t+1}$ during the announcement period is 0.2% and insignificantly different from zero ($p = .529$). This result indicates that, on average, the announcement of a sustainability report containing SASB metrics has neither a positive or a negative impact on firm value. This result contrasts with previous research by Griffin and Sun (2013) showing that voluntary corporate sustainability disclosures generate positive returns for shareholders. Griffin and Sun (2013) interpret their result to be consistent with companies disclosing information voluntarily when it is value enhancing for shareholders, net of related costs.

One difference between the two studies is that we focus on annual sustainability reports while Griffin and Sun (2013) focus on corporate news releases relating to greenhouse gas emissions. Many of the companies in our sample have routinely issued annual sustainability reports in previous years. For these firms, it is arguable whether the voluntary disclosure explanation applies, because they have already established a reputation for making such disclosures on an annual basis. Nevertheless, Griffin and Sun (2013) also report that their sample contains firms with multiple announcements and that their results are consistent across both single and multiple releases and first-time versus subsequent releases. Another difference is that their sample covers the period from 2000 to 2010, while our sample period spans from 2016 to 2021. Their sample is therefore more heavily weighted to 'early disclosers,' while our sample is more heavily weighted to later disclosures, who are more likely to be disclosing in response to peer and stakeholder pressure.

Column (2) of Table 5 reports the mean value of *Abnormal Volatility* along with its 95% confidence interval and the p-value for a two-sided test against a null hypothesis of one. The average *Abnormal Volatility* during sustainability report announcement periods is 1.085 and insignificantly different from one. Recall that our first prediction was that this variable would be significantly greater than 1. This would be indicative of a significant stock price impact in response to the an-

nouncement of corporate sustainability reports. Instead, the point estimate indicates that there is only a slight increase in volatility of 8.4%. Moreover, the 95% confidence interval spans the range of 0.75 to 1.42, indicating that we cannot reject the null of no increase in volatility, while it is very unlikely that any increase in volatility exceeds 42%.

Column (3) of Table 5 reports the mean value of *Abnormal Volume* along with its 95% confidence interval and the p-value for a two-sided test against a null hypothesis of zero. The average *Abnormal Volume* is 0.036 and insignificantly different from zero. Recall that our second prediction was that this variable would be significantly greater than 0. This would be indicative of a significant trading volume impact in response to the announcement of corporate sustainability reports. Instead, the point estimate indicates that there is only a slight increase in trading volume of 3.6%. Moreover, the 95% confidence interval spans the range of -0.10 to 0.18, indicating that we cannot reject the null of no increase in volume, while it is very unlikely that any increase in volume exceeds 18%.

Taken together, the results in columns (2) and (3) of Table 5 do not provide compelling evidence that annual corporate sustainability reports containing SASB metrics provide a significant amount of new and value relevant information to investors. One potential explanation for the results in Table 5 is that our tests lack power. In order to calibrate the price and volume impacts of financially material information, Table 6 replicates the results in Table 5 using quarterly earnings announcements. In order to match the sample size and period, we use the first quarterly earnings announcement immediately preceding each sustainability report announcement. These results corroborate earlier research findings of strong price and volume impacts for earnings announcements. The point estimate of *Abnormal Volatility* for earnings-release dates is 3.087 and highly statistically significant. The 95% confidence interval indicates that stock return volatility increases by at least 136% during earnings announcements. Similarly, the point estimate of *Abnormal Volume* is 0.997 and highly statistically significant. The 95% confidence interval indicates that trading volume increases by at least 84% during earnings announcements. Table 7 reports similar results using all earnings announcements made within 130 days of each sustainability report announcement.

Table 8 reports formal two-sample t-tests for difference in means between the responses to the two sets of announcements. We assume unequal variances for these t-tests. The results show that the *Abnormal Volatility* and *Abnormal Volume* are higher on earnings release dates than on sustainability report dates, and that these differences are highly economically and statistically significant. In other words, we can infer with a high degree of confidence that annual sustainability reports containing SASB metrics have significantly less information content than quarterly earnings reports. This is despite the fact that earnings reports are updated on a quarterly basis, while the sustainability reports are generally updated on an annual basis. Thus, compared to traditional financial metrics, sustainability metrics appear to contain relatively little financially material information.

Finally, we consider two factors that may mediate the market reaction to SASB reports. First, we test whether the market reaction is greater for a firm's inaugural report. There are two reasons to expect a stronger response for inaugural reports. First, subsequent reports provide annual updates to sustainability metrics, many of which are likely to be highly persistent. The inaugural report, however, may provide investors with the the initial read on a metric. Second, following [Griffin and Sun \(2013\)](#), voluntary disclosure theory predicts that firms are more likely to initiate sustainability disclosures when they provide good news to investors.

The second mediating factor that we consider is whether the market reaction is greater for firms that disclose the publication of the report by filing a Form 8-K with the SEC. The filing of a Form 8-K suggests that the firm considers the report to contain material non-public information.

Table 9 reports the results of these tests. We construct two indicator variables to implement the tests. $I(\text{Inaugural SASB Report})$ evaluates to 1 for the 46 observations in our sample for which the announcement indicates that it is an inaugural sustainability report, and 0 for all other observations.⁹ $I(\text{Related 8-K Filed})$ evaluates to 1 for the 15 observations in our sample for which the firm filed a related Form 8-K, and 0 for all other observations. These tests use the same sample of 276 qualifying SASB-report release dates and the same dependent variables as our earlier tests,

⁹42 cases self-identify as inaugural sustainability reports while 4 self-identify as inaugural SASB-aligned reports.

but include the two indicators as explanatory variables in ordinary least squares regressions. The regression intercepts represent the mean values of the dependent variables across observations for which the indicator variables are both zero—that is, reports that were neither inaugural nor accompanied by an 8-K filing.

Column 1 provides no evidence of a statistically significant difference in $CAR_{t-1,t+1}$ for either of the indicator variables. The point estimate of $I(\text{Inaugural SASB Report})$, however, is 1.0%. While insignificant at the 10% level, the sign and magnitude are consistent with the voluntary disclosure of good news. Similarly, Column 2 provides no evidence of a statistically significant difference in *Abnormal Volatility* for either indicator. But the signs of both indicators are positive, which is directionally consistent with greater volatility.

Finally, Column 3 provides evidence of a significantly negative coefficient on $I(\text{Inaugural SASB Report})$ and a significantly positive coefficient on $I(\text{Related 8-K Filed})$. The negative coefficient on $I(\text{Inaugural SASB Report})$ indicates that trading volume is lower around the release of inaugural reports. This result is inconsistent with inaugural reports providing decision-useful information to investors. Finally, the positive coefficient on $I(\text{Related 8-K Filed})$ indicates that trading volume is higher for SASB reports accompanied by an 8-K filing. This result is consistent with managers choosing to file an 8-K when the report contains financially material information. We note, however, that this result is only significant at the 10% level and is not accompanied by a statistically significant increase in return volatility.

4.2 Additional Tests Evaluating Competing Explanations

The results thus far provide no compelling evidence of a significant stock market reaction to the release of corporate sustainability reports incorporating SASB metrics. These results are open to several interpretations. First, stock prices may not fully incorporate financially material information in these releases on a timely basis. While a large body of research finds that stock prices respond to new and material information in a timely manner (e.g., [Fama \(1991\)](#)), there is also evidence of a delayed response to information in earnings announcements (e.g., [Bernard and Thomas](#)

(1989)). Second, it is possible that the reported metrics are financially immaterial. For example, a common set of SASB metrics relate to monetary losses associated with legal proceedings, but recent research suggests that such losses are generally financially immaterial (see [Raghunandan and Rajgopal \(2022\)](#)). Third, while some of the reported metrics may be financially material, they may have been preempted by more timely disclosures. Financial reporting regulations require the timely disclosure of financially material events and previous research finds that such disclosures have significant information content (see [Carter and Soo \(1999\)](#); [Lerman and Livnat \(2010\)](#)). This subsection provides further tests to distinguish between these competing explanations.

We begin by testing whether there is a delayed response to information in corporate sustainability reports containing SASB metrics. A challenge in conducting these tests is that it is difficult to determine whether information in sustainability reports provides good or bad news about firm value. To overcome this challenge, we assume that there is a partial response during the initial announcement period to any good or bad news in the releases. Thus, we classify observations with positive cumulative abnormal returns in the three day announcement period as 'good news' announcements and observations with negative cumulative abnormal returns in the three day announcement period as 'bad news' announcements. Next, we track the average cumulative abnormal returns for each set of firms over the next 60 trading days. This 60 trading day period should incorporate the subsequent quarterly earnings announcement, allowing for the possibility that financially immaterial information is not priced by investors until it is disseminated via the next earnings announcement. The results are presented in [Figure 1](#) and [Table 10](#). [Figure 1](#) shows announcement returns of about 2% for the positive announcement return portfolio and -2% for the negative announcement return portfolio. However, there is no visible evidence of a drift in these initial announcement returns over the next 60 days. [Table 10](#) provides formal statistical tests for a post-announcement drift in returns. The results confirm that there is no evidence of a drift. Thus, there is no evidence to support the delayed price response explanation.

We next test the financial immateriality explanation. In order to test this explanation, we seek to identify frequently reported SASB metrics and analyze their financial materiality. The SASB

standards are industry-specific and specify a total of 993 sustainability metrics across 77 industries. While many metrics are applicable to just one industry, there are some common themes. For example, 68 of the metrics relate to the “total amount of monetary losses as a result of legal proceedings” and are further broken down by nature of legal proceeding (e.g., environmental, product safety). A further 29 metrics relate to “total energy consumed” and are further broken down by source of energy (e.g., grid, renewable). We choose to focus on monetary losses from legal proceedings for two reasons. First, such metrics appear most frequently across all industries. Second such monetary losses, if sufficiently large, have high potential for financial materiality.

In order to conduct our tests, we follow [Raghunandan and Rajgopal \(2022\)](#) in using data from the Violation Tracker database. This database is produced by the Corporate Research Project of Good Jobs First. It is a comprehensive database on corporate misconduct including banking, consumer protection, false claims, environmental, wage & hour, safety, discrimination, price-fixing and other cases resolved by the Justice Department and state and federal regulatory agencies. It includes 512,000 civil and criminal cases since 2000 from more than 400 agencies with penalties totalling \$786 billion. Merging this database with our universe yields a sample of 6,497 violations from 2016 to 2021. Table 11 breaks down this sample by violation type. Almost half of the violations relate to workplace safety and health, followed by environmental with 1,272 violations and employment with 421 violations.

Table 12 provides summary statistics on the magnitude of the penalties associated with the violations. It reports both the dollar amount of the penalty and the amount of the penalty expressed as a percentage of market capitalization. For all non-zero penalties in our universe, shown in Panel A, the mean penalty is \$11.866 million or 0.105% of market capitalization. The penalties, however, are highly skewed and the corresponding medians are only \$0.016 million or 0.000% of market capitalization. Thus, as previously pointed out by [Raghunandan and Rajgopal \(2022\)](#), such violations are typically financially immaterial. Panel B summarizes the subset of penalties related to firm-years with a sustainability report incorporating SASB metrics. The mean penalty is even smaller, amounting to only \$2.682 million or 0.019% of market capitalization. Moreover, only 153 out of

our 276 firm-years have a penalty. Thus, such penalties are typically financially immaterial for our sample of sustainability reports. Panel C presents descriptive statistics for major penalties in our sample universe. We limit this panel to penalties exceeding 1% of market capitalization and firms with market capitalizations exceeding \$1 billion. This results in a sample of only 43 violations. Despite the small sample size, the penalties are clearly financially material, averaging \$1,138.348 million or 4.468% of market capitalization. Thus, while the typical violation is financially immaterial, a small number of financially material violations does exist.

Finally, we test whether financially material sustainability metrics are preempted by other more timely disclosures. To do this, we conduct a manual search for company disclosures relating to the 43 major penalties identified in Panel C of Table 12. The disclosures that we search include (i) any company press release coincident with the announcement of the penalty, (ii) any Form 8-K coincident with the announcement of the penalty, (iii) the Form 10-K issued after the penalty and (iv) Form 10-K issued prior to the penalty.¹⁰ For (i) and (ii), we determine whether such disclosures exist and, if so, whether they identify the nature and amount of the penalty. For (iii) we determine whether the nature and amount of the penalty is identified in the Form 10-K. For (iv), we determine whether the existence and nature of the violation is identified in the Form 10-K (since the amount has not yet been announced). The results are presented in Table 13. The most notable result is that 100% of the violations and associated penalties are identified in the Form 10-K immediately following the penalty. Thus, disclosure of the penalty amount in the sustainability report simply duplicates the corresponding disclosure from the Form 10-K. Moreover, 91% identify the existence and nature of the violation in the Form 10-K prior to the penalty, 67% issue a Form 8-K announcing the penalty and 63% issue a press release announcing the penalty. Thus, violations associated with financially material penalties can usually be anticipated from other required company disclosures.

Another potential source of information about legal penalties are the announcements made by the government agencies imposing the penalties. The Violation Tracker database records these announcement dates, allowing us to test whether they have information content. We test for in-

¹⁰In some cases, the penalty was announced through a preliminary judgement and subsequently approved. In these cases, we include disclosures relating to the preliminary announcement.

formation content using the same procedures that we previously used for sustainability report announcement dates and earnings announcement dates. The results are reported in Table 14. Panel A reports results for all 6,497 violations in our sample universe. Stock market data availability limits the sample to 6,118 observations. The average announcement CAR is insignificant, but abnormal volatility and volume are both significantly positive. These results indicate that the announcements don't provide systematically bad news, but they do provide new information to investors. Thus, it seems that investors have unbiased expectations about the magnitude of the penalty, but that the announcements resolve uncertainty about the exact amount of the penalty. Panel B reports results for the sample of 169 violations that overlap with our sample of SASB reports. Recall from Table 12 that these violations were extremely small. Thus, perhaps not surprisingly, there is no evidence of information content. Finally, Panel C reports results for the sample of 43 major penalties. There is again no evidence of information content. The mean CAR is close to zero and abnormal volatility and volume are both slightly elevated but insignificantly different from zero. Thus, it appears that these penalties are largely anticipated by investors. We note, however, that the tests in Panel C lack power due to the small sample size.

In summary, these additional tests suggest that the most likely explanation for the lack of information content in SASB reports is that the disclosures contained therein are mostly financially immaterial. Moreover, the small subset of financially material disclosures are typically preempted in other required disclosure documents, such as Form 8-K and Form 10-K.

5 Conclusion

This paper examines the stock market reaction to the release of corporate sustainability reports incorporating SASB standards that are designed to provide financially material and decision-useful information to investors. We are unable to find compelling evidence of a significant stock market reaction to the reports. Further tests indicate that the information contained in the reports is typically not financially material. Moreover, in cases where it is financially material, it is preempted by other required disclosure documents, such as Form 8-K and Form 10-K.

We conclude that the demand for sustainability reports extends beyond the demand for financially material information by investors. The focus of the SASB, the TCFD and the ISSB on providing value-relevant information to investors arises as a convenient adaptation of the traditional financial accounting standard-setting framework. Yet while the demand for traditional accounting information derives primarily from investors concerned with assessing enterprise value, the demand for sustainability information derives from a broader set of stakeholders who are primarily concerned with environmental and social impacts. As such, the focus on providing value-relevant information to investors is unnecessarily narrow. Moreover, while traditional financial information serves primarily to inform investors about firm value, sustainability information can also have a direct impact on firm value. This is because stakeholders use this information to establish the terms on which they choose to transact with the enterprise. For example, potential investors, customers and employees may choose not to engage with an enterprise that is perceived to have large negative environmental and social impacts. Thus, the profit maximizing strategy of the enterprise may be to mitigate these potential negative impacts and use sustainability reporting to communicate these mitigation actions to stakeholders.

Our findings and conclusion have important implications for the ISSB, which is currently in the initial phases of designing a global baseline of high quality sustainability disclosure standards.¹¹ The ISSB has a stated objective of meeting the needs of investors and creditors in determining firm value. As such, it is proposing to adopt the traditional financial reporting definition of materiality that focuses on the financial decisions of investors. We are unable to provide compelling evidence that existing sustainability disclosures with a similar focus provide a significant amount of new information to investors. We therefore encourage the ISSB to consider broadening the scope of its disclosures. One alternative would be to align with the GRI and European Commission by expanding the definition of materiality to incorporate material environmental and social impacts that are of interest to a broader group of stakeholders. Another alternative would be to expand the

¹¹<https://www.ifrs.org/content/dam/ifrs/project/general-sustainability-related-disclosures/exposure-draft-ifrs-s1-general-requirements-for-disclosure-of-sustainability-related-financial-information.pdf>.

scope of the disclosures beyond sustainability to incorporate other metrics that convey significant value relevant information to investors. Many firms already report key performance indicators that convey useful information to investors (Givoly, Li, Lourie, and Nekrasov, 2019), but there is currently no global baseline of standards for such disclosures.

Our findings and conclusion also have implications for corporate issuers of sustainability reports. In particular, they imply that a corporation's sustainability disclosures should embrace a broad stakeholder perspective centered around providing transparency about the corporation's material environmental and social impacts. In this respect, we hasten to add that our analysis of corporate sustainability disclosures suggests that most reporting companies already align well with this perspective. For example, Apple provides access to its ESG disclosures on a dedicated web page which it introduces by stating:¹²

"We are committed to demonstrating that business can and should be a force for good. Achieving that takes innovation, collaboration, and a focus on serving others. It also means leading with our values in the technology we make, the way we make it, and how we treat people and the planet we share. We're always working to leave the world better than we found it, and to create powerful tools that empower others to do the same."

While aligning with the SASB and TCFD voluntary reporting frameworks, Apple also aligns with the GRI's framework. Moreover, Apple does not always issue press releases announcing the concurrent availability of new sustainability disclosures. Instead, Apple discloses this data across a number of reports and websites and only occasionally announces updates via press releases, and sometimes with a delay. For example, Apple issued a press release celebrating Earth Day on April 21, 2021 in which it made reference to its "recently released 2021 Environmental Progress Report" that had been available on its website since April 16, 2021.¹³ This disclosure policy is consistent with a primary purpose of informing a broad group of stakeholders about Apple's environmental and social impacts.

¹²<https://investor.apple.com/esg/default.aspx>

¹³<https://www.apple.com/newsroom/2021/04/apple-celebrates-earth-day-2021/>

References

- Ball, R. and P. Brown (1968). An Empirical Evaluation of Accounting Income Numbers. *Journal of Accounting Research* 6(2), 159–178.
- Barth, M. E., S. F. Cahan, L. Chen, and E. R. Venter (2017). The economic consequences associated with integrated report quality: Capital market and real effects. *Accounting, Organizations and Society* 62(2017), 43–64.
- Beaver, W. H. (1968). The Information Content of Annual Earnings Announcements. *Journal of Accounting Research* 6, 67–92.
- Beaver, W. H., M. F. McNichols, and Z. Z. Wang (2018). The information content of earnings announcements: new insights from intertemporal and cross-sectional behavior. *Review of Accounting Studies* 23(1), 95–135.
- Beaver, W. H., M. F. McNichols, and Z. Z. Wang (2020). Increased market response to earnings announcements in the 21st century: An Empirical Investigation. *Journal of Accounting and Economics* 69(1).
- Berchicci, L. and A. A. King (2021). Materiality and Corporate Sustainability: A Model Uncertainty Analysis. *SSRN Electronic Journal*.
- Bernard, V. L. and J. K. Thomas (1989). Post-earnings-announcement drift: delayed price response or risk premium? *Journal of Accounting Research* 27(supplement), 1–36.
- Busco, C., C. Consolandi, R. G. Eccles, and E. Sofra (2020). A Preliminary Analysis of SASB Reporting: Disclosure Topics, Financial Relevance, and the Financial Intensity of ESG Materiality. *SSRN Electronic Journal*, 1–16.
- Capelle-Blancard, G. and A. Petit (2019). Every Little Helps? ESG News and Stock Market Reaction. *Journal of Business Ethics* 157(2), 543–565.
- Carter, M. E. and B. S. Soo (1999). The relevance of Form 8-K reports. *Journal of Accounting Research* 37(1), 119–132.
- Christensen, H., L. Hail, and C. Leuz (2021). Mandatory CSR and Sustainability Reporting: Economic Analysis and Literature Review. *NBER Working Paper Series*.
- Dhaliwal, D. S., O. Z. Li, A. Tsang, and Y. G. Yang (2011). Voluntary nonfinancial disclosure and the cost of equity capital: The initiation of corporate social responsibility reporting. *Accounting Review* 86(1), 59–100.
- Dietz, T., E. Ostrom, and P. C. Stern (2003). The Struggle to Govern the Commons. *Science* 302(5652).
- European Commission (2019). Guidelines on non-financial reporting: Supplement on reporting climate-related information. Technical report.
- Fama, E. F. (1991). Efficient Capital Markets: II. *The Journal of Finance* 46(5).
- Friedman, M. (1962). Capitalism and Freedom: Fortieth Anniversary Edition. Chicago: University of Chicago Press. (Erstauflage erschienen 1962).
- Giorgino, M. C., E. Supino, and F. Barnabè (2017). Corporate disclosure, materiality, and integrated report: An event study analysis. *Sustainability (Switzerland)* 9(12), 1–15.

- Givoly, D., Y. Li, B. Lourie, and A. Nekrasov (2019). Key performance indicators as supplements to earnings: Incremental informativeness, demand factors, measurement issues, and properties of their forecasts. *Review of Accounting Studies* 24(4).
- Global Reporting Initiative (2022). GRI 1: Foundation 2021. Technical report.
- Grewal, J., C. Hauptmann, and G. Serafeim (2021). *Material Sustainability Information and Stock Price Informativeness*, Volume 171. Springer Netherlands.
- Griffin, P. A., D. H. Lont, and E. Y. Sun (2017). The Relevance to Investors of Greenhouse Gas Emission Disclosures. *Contemporary Accounting Research* 34(2), 1265–1297.
- Griffin, P. A. and Y. Sun (2013). Going green: Market reaction to CSRwire news releases. *Journal of Accounting and Public Policy* 32(2), 93–113.
- Khan, M., G. Serafeim, and A. Yoon (2016). Corporate sustainability: First evidence on materiality. *Accounting Review* 91(6), 1697–1724.
- Krüger, P. (2015). Corporate goodness and shareholder wealth. *Journal of Financial Economics* 115(2), 304–329.
- Lerman, A. and J. Livnat (2010). The new Form 8-K disclosures. *Review of Accounting Studies* 15(4), 752–778.
- Madison, N. and E. Schiehl (2021). The effect of financial materiality on esg performance assessment. *Sustainability (Switzerland)* 13(7).
- Naughton, J. P., C. Wang, and I. Yeung (2019). Investor sentiment for corporate social performance. *Accounting Review* 94(4), 401–420.
- Plumlee, M., D. Brown, R. M. Hayes, and R. S. Marshall (2015). Voluntary environmental disclosure quality and firm value: Further evidence. *Journal of Accounting and Public Policy* 34(4), 336–361.
- Raghunandan, A. and S. Rajgopal (2022). Do ESG Funds Make Stakeholder Friendly Investments? *Review of Accounting Studies* (Forthcoming).
- Renneboog, L., J. Ter Horst, and C. Zhang (2008). Socially responsible investments: Institutional aspects, performance, and investor behavior. *Journal of Banking and Finance* 32(9), 1723–1742.
- SASB (2020). Proposed Changes To the SASB Conceptual Framework & Rules of Procedure: Bases for Conclusions & Invitation To Comment on Exposure Drafts. Technical report.
- Schiehl, E. and S. Kolahgar (2021). Financial materiality in the informativeness of sustainability reporting. *Business Strategy and the Environment* 30(2), 840–855.
- Serafeim, G. and A. Yoon (2021). Which Corporate ESG News does the Market React to? *SSRN Electronic Journal*.
- Spandel, T., F. Schiemann, and A. G. F. Hoepner (2020). Capital Market Effects of ESG Materiality Standards. *SSRN Electronic Journal* (19026202).

Fig. 1.
Cumulative Abnormal Returns Following the Announcement of Sustainability Reports containing SASB Metrics

Figure 1 displays equal-weighted market-adjusted abnormal returns for our sample of firms on each day following their SASB report release date. Daily abnormal returns are calculated as the residual from regressing the firm's returns on the S&P500's returns from the 30 most recent trading days, inclusive, and are cumulated from $t - 1$ to $t + 30$. $CAR_{t-1,t+1}$ is the 3-day, market-model cumulative abnormal return around the SASB report release date. We use this announcement return to sort the sample into two portfolios. The first portfolio consists of all observations with positive announcement returns and the second portfolio consists of all observations with negative announcement returns. The dashed lines represent the level of cumulative announcement period abnormal returns for each group.

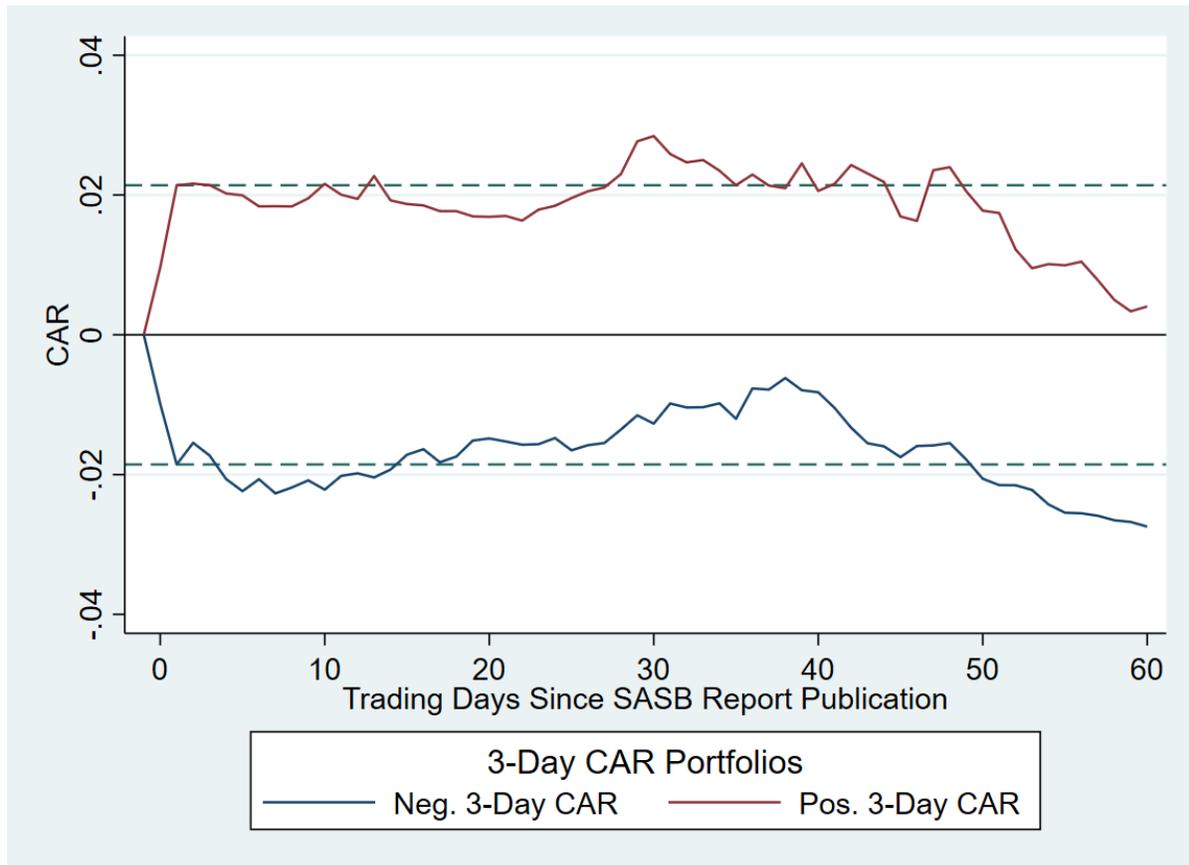


Table 1.
Sample Construction

Table 1 lists steps of attrition in our sample selection beginning with all reports identified by the SASB.

Unique U.S. SASB Reporter Dates, 2016—September 2021	846
Less reports that cannot be viewed	(90)
Less reports with no identifiable announcement	(244)
Less reports with an announcement that is ambiguous as to the report publication date	(181)
Less observations with a concurrent financial announcement within a 5-day window	(44)
Less firm-SASB-report-dates that cannot be merged to CRSP	(9)
Less obs w/ insufficient data to construct DVs for SASB ann. date or nearest previous earnings release date	(2)
Main Analysis Sample Observations (Tables 5, 6 and 8):	276

Table 2.
Sample Composition: Announcement Types

Table 2 lists the newswire service or other method used to announce the release of the report.

	Frequency	%	Cum.
Accesswire	3	1.09	1.09
Business Wire	119	43.12	44.21
CSR Newswire	1	0.36	44.57
Company Only-News Release	15	5.43	50.00
Company Only-Other	10	3.62	53.62
Form 8-K	1	0.36	53.98
Globe Newswire	52	18.84	72.82
PR Newswire	75	27.17	100.00
Total	276	100.00	

Table 3.
Summary Statistics for Financial Characteristics

**Panel A: Fundamentals for our Analysis Sample, for the FY Prior to SASB Disclosure Date
(Winsorized at 1%)**

	Mean	Median	S.D.	Min	Max
<i>Total Assets</i>	38,112	13,467	62,127	141	281,000
<i>Total Revenue</i>	13,656	6,278	19,028	0	69,233
<i>ROE (NI)</i>	0.065	0.091	0.394	-3.563	1.094
<i>ROA (NI)</i>	0.018	0.029	0.131	-1.486	0.244
<i>Leverage</i>	4.162	2.902	3.793	1.102	24.722
Observations	272				

**Panel B: Fundamentals for Compustat Universe, FY2016-2021
(Winsorized at 1%)**

	Mean	Median	S.D.	Min	Max
<i>Total Assets</i>	9,529	506	35,684	0	281,000
<i>Total Revenue</i>	3,101	165	9,71	0	69233
<i>ROE (NI)</i>	-0.314	0.030	1.291	-9.360	1.094
<i>ROA (NI)</i>	-0.509	0.003	2.286	-19.000	0.434
<i>Leverage</i>	3.642	2.144	3.956	1.009	24.722
Observations	31,574				

Panel C: T-tests for Differences in Means

	Mean(Sample)	Mean(Compustat)	Diff.	Std. Error	P-value
<i>Total Assets</i>	38,112	9,530	28,830***	3,772	0.0000
<i>Total Revenue</i>	13,656	3,101	10,647***	1,164	0.0000
<i>ROE (NI)</i>	0.0652	-0.3140	0.3827***	0.0257	0.0000
<i>ROA (NI)</i>	0.0176	-0.5089	0.5311***	0.0153	0.0000
<i>Leverage</i>	4.1620	3.6415	-0.5256**	0.2351	0.0262

Table 4.
Fama-French 48 Industries

Table 4 lists the Fama-French 48 Industry Classifications and the proportion of the Analysis Sample and Compustat Universe that fall under each classification.

Fama-French Industry	Analysis Sample (%)	Compustat Universe (%)
Agriculture	0.00	0.25
Food Products	4.78	1.05
Candy & Soda	0.00	0.27
Beer & Liquor	0.37	0.31
Tobacco Products	1.10	0.05
Recreation	0.00	0.46
Entertainment	0.74	1.07
Printing and Publishing	0.00	0.34
Consumer Goods	1.47	0.84
Apparel	1.84	0.57
Healthcare	0.37	1.13
Medical Equipment	1.84	2.69
Pharmaceutical Products	3.31	12.26
Chemicals	5.88	1.40
Rubber and Plastic Products	0.74	0.36
Textiles	0.00	0.10
Construction Materials	2.21	1.24
Construction	1.10	0.79
Steel Works Etc	1.10	0.73
Fabricated Products	0.37	0.14
Machinery	4.41	1.92
Electrical Equipment	1.47	0.98
Automobiles and Trucks	2.21	1.13
Aircraft	0.74	0.34
Shipbuilding, Railroad Equipment	0.37	0.16
Defense	0.00	0.11
Precious Metals	1.10	3.69
Non-Metallic and Industrial Metal Mining	0.00	5.11
Coal	0.37	0.27
Petroleum and Natural Gas	6.25	4.85
Utilities	7.72	3.36
Communication	0.37	2.04
Personal Services	0.00	0.95
Business Services	7.72	10.65
Computers	1.10	1.33
Electronic Equipment	3.31	3.25
Measuring and Control Equipment	0.37	1.10
Business Supplies	1.47	0.55
Shipping Containers	0.74	0.15
Transportation	5.15	2.56
Wholesale	2.94	2.14
Retail	4.41	2.93
Restaurants, Hotels, Motels	1.10	1.21
Banking	4.41	9.74
Insurance	3.31	2.20
Real Estate	0.37	1.18
Trading	10.29	6.56
Almost Nothing	1.10	3.46
Total	100	100

Table 5.

Stock Market Reaction to the Announcement of Corporate Sustainability Reports Containing SASB Metrics

$CAR_{t-1,t+1}$ is the 3-day, market-model cumulative abnormal return around the SASB report announcement date. Daily abnormal returns are calculated as the residual from regressing the firm's returns on the S&P500's returns from the 30 most recent trading days, inclusive, and are cumulated from $t - 1$ to $t + 1$. *Abnormal Volatility* is the squared value of $CAR_{t-1,t+1}$ for the report announcement date divided by the average value for non announcement dates. This variable is defined so that its average value on non-announcement dates is 1. To seed the average volatility measure, we exclude the three-day trading windows around both SASB-report release dates and earnings release dates, and use a +/- 130-day window, following Beaver et al. (2020). *Abnormal Volume* is the mean of the trading volume (scaled by total shares outstanding) on each of the three days centered on the report announcement date, minus the mean scaled trading volume during the non-announcement period, divided by the standard deviation of the same. To seed the mean and standard deviation for this measure, we exclude the three-day trading windows around both SASB-report release dates and earnings release dates, and use a +/- 130-day window, following Beaver et al. (2020). 95% confidence intervals are indicated in brackets below each parameter estimate. P-values for a two-sided t-test of the null hypothesis for each respective dependent variable are reported.

	(1)	(2)	(3)
	$CAR_{t-1,t+1}$	<i>Abnormal Volatility</i>	<i>Abnormal Volume</i>
	0.002	1.085	0.036
	[-0.0036,0.0070]	[0.7463,1.4231]	[-0.1039,0.1757]
Null Hypothesis	$\beta = 0$	$\beta = 1$	$\beta = 0$
P-Value	0.529	0.622	0.613
Observations	276	276	276

Table 6.

Stock Market Reaction to the Announcement of Nearest-Previous Earnings Report

$CAR_{t-1,t+1}$ is the 3-day, market-model cumulative abnormal return around the nearest-previous earnings report announcement date. Daily abnormal returns are calculated as the residual from regressing the firm's returns on the S&P500's returns from the 30 most recent trading days, inclusive, and are cumulated from $t - 1$ to $t + 1$. *Abnormal Volatility* is the squared value of $CAR_{t-1,t+1}$ for the report announcement date divided by the average value for non announcement dates. This variable is defined so that its average value on non-announcement dates is 1. To seed the average volatility measure, we exclude the three-day trading windows around both SASB-report release dates and earnings release dates, and use a +/- 130-day window, following Beaver et al. (2020). *Abnormal Volume* is the mean of the trading volume (scaled by total shares outstanding) on each of the three days centered on the report announcement date, minus the mean scaled trading volume during the non-announcement period, divided by the standard deviation of the same. To seed the mean and standard deviation for this measure, we exclude the three-day trading windows around both SASB-report release dates and earnings release dates, and use a +/- 130-day window, following Beaver et al. (2020). 95% confidence intervals are indicated in brackets below each parameter estimate. P-values for a two-sided t-test of the null hypothesis for each respective dependent variable are reported.

	(1)	(2)	(3)
	$CAR_{t-1,t+1}$	<i>Abnormal Volatility</i>	<i>Abnormal Volume</i>
	0.003	3.087	0.997
	[-0.0045,0.0106]	[2.3555,3.8183]	[0.8355,1.1584]
Null Hypothesis	$\beta = 0$	$\beta = 1$	$\beta = 0$
P-Value	0.430	0.000	0.000
Observations	281	281	281

Table 7.
 Stock Market Reaction to the Announcement of All Earnings Reports
 in 130-day Window Around SASB Release Date

$CAR_{t-1,t+1}$ is the 3-day, market-model cumulative abnormal return around the earnings report announcement date. Each earnings report issued within a 130-day window around the SASB report release date is included. Daily abnormal returns are calculated as the residual from regressing the firm's returns on the S&P500's returns from the 30 most recent trading days, inclusive, and are cumulated from $t - 1$ to $t + 1$. *Abnormal Volatility* is the squared value of $CAR_{t-1,t+1}$ for the report announcement date divided by the average value for non announcement dates. This variable is defined so that its average value on non-announcement dates is 1. To seed the average volatility measure, we exclude the three-day trading windows around both SASB-report release dates and earnings release dates, and use a +/- 130-day window, following Beaver et al. (2020). *Abnormal Volume* is the mean of the trading volume (scaled by total shares outstanding) on each of the three days centered on the report announcement date, minus the mean scaled trading volume during the non-announcement period, divided by the standard deviation of the same. To seed the mean and standard deviation for this measure, we exclude the three-day trading windows around both SASB-report release dates and earnings release dates, and use a +/- 130-day window, following Beaver et al. (2020). 95% confidence intervals are indicated in brackets below each parameter estimate. P-values for a two-sided t-test of the null hypothesis for each respective dependent variable are reported.

	(1)	(2)	(3)
	$CAR_{t-1,t+1}$	<i>Abnormal Volatility</i>	<i>Abnormal Volume</i>
	0.001	3.167	1.058
	[-0.0028,0.0057]	[2.7937,3.5405]	[0.9614,1.1538]
Null Hypothesis	$\beta = 0$	$\beta = 1$	$\beta = 0$
P-Value	0.499	0.000	0.000
Observations	1,001	1,001	1,001

Table 8.

Comparison of the Stock Market Reaction to Corporate Sustainability Reports Containing SASB Metrics versus Nearest-Previous Quarterly Earnings Report

The table below reports formal t-tests for differences in means between the market-reaction variables for SASB report announcements versus the nearest previous earnings report announcement. We report mean values for each group, the difference, the standard error of the difference, and the p-value for a test of zero difference in means. (Equal variances for the groups are not assumed.) $CAR_{t-1,t+1}$ is the 3-day, market-model cumulative abnormal return around the report announcement date. Daily abnormal returns are calculated as the residual from regressing the firm's returns on the S&P500's returns from the 30 most recent trading days, inclusive, and are cumulated from $t - 1$ to $t + 1$. *Abnormal Volatility* is the squared value of $CAR_{t-1,t+1}$ for the report announcement date divided by the average value for non announcement dates. This variable is defined so that its average value on non-announcement dates is 1. To seed the average volatility measure, we exclude the three-day trading windows around both SASB-report release dates and earnings release dates, and use a +/- 130-day window, following Beaver et al. (2020). *Abnormal Volume* is the mean of the trading volume (scaled by total shares outstanding) on each of the three days centered on the report announcement date, minus the mean scaled trading volume during the non-announcement period, divided by the standard deviation of the same. To seed the mean and standard deviation for this measure, we exclude the three-day trading windows around both SASB-report release dates and earnings release dates, and use a +/- 130-day window, following Beaver et al. (2020).

	Mean(Earnings Report)	Mean(SASB Report)	Diff.	Std. Error	P-value
$CAR_{t-1,t+1}$	0.0030	0.0017	0.0013	0.0047	0.7771
<i>Abnormal Volatility</i>	3.0869	1.0847	2.0021***	0.4094	0.0000
<i>Abnormal Volume</i>	0.9970	0.0359	0.9611***	0.1085	0.0000

Table 9.

Regression Tests: Stock Market Reactions for Inaugural SASB reports and Reports with Related 8-K filings

This table reports the results of regression tests of the main effects in Table 5. We use the same analysis sample of qualifying SASB-report release dates, but include two indicator variables: $I(\text{Inaugural SASB Report})$ is an indicator variable that evaluates to 1 if the press release indicates that the SASB report is the firm's first such report, and $I(\text{Related 8-K Filed})$ is an indicator variable that evaluates to 1 if the firm filed an 8-K referencing the SASB filing (i.e., an indicator that the firm considered the report potentially material). Because this analysis sample is the 276 qualifying SASB-report company release dates, the intercept represents the mean value of the dependent variables for the observations for which the indicator variables are both zero—that is, SASB releases that were not indicated as inaugural and for which no related 8-K was filed. The dependent variables, $CAR_{t-1,t+1}$, $Abnormal\ Volatility$, and $Abnormal\ Volume$ are all the same, as defined above. 95% confidence intervals are indicated in brackets below each parameter estimate. Significance levels for p-values for a two-sided t-test of the null are indicated by *, **, *** for 10%, 5%, and 1%. For the interaction terms, the null hypothesis is that the parameter estimate is zero. For the intercept, the null hypothesis is that the intercept is 0 for $CAR_{t-1,t+1}$ and $Abnormal\ Volume$, and 1 for $Abnormal\ Volatility$, as in the tables above.

	(1)	(2)	(3)
	$CAR_{t-1,t+1}$	$Abnormal\ Volatility$	$Abnormal\ Volume$
$I(\text{Inaugural SASB Report})$	0.010 [-0.0097,0.0301]	0.629 [-0.7859,2.0445]	-0.331*** [-0.5545,-0.1083]
$I(\text{Related 8-k Filed})$	-0.006 [-0.0390,0.0270]	0.445 [-1.0020,1.8918]	0.829* [-0.0930,1.7501]
Constant	0.000 [-0.0046,0.0054]	0.958 [0.6532,1.2627]	0.045 [-0.1136,0.2034]
Observations	276	276	276
R^2	0.0003	0.0010	0.0270

Table 10.
Tests for Delayed Information Content

This table reports the results of tests of whether there is an incomplete response to good or bad news at the SASB report announcement date. We report formal t-tests for differences in means between the cumulative abnormal returns for the equal-weighted portfolios of firms with positive and negative 3-day announcement CARs over various time frames. We report mean values for each group, the difference, the standard error of the difference, and the p-value for a test of zero difference in means. (Equal variances for the groups are not assumed.) Daily abnormal returns are calculated as the residual from regressing the firm's returns on the S&P500's returns from the 30 most recent trading days, inclusive, and are cumulated over various periods. $CAR_{t-1,t+1}$ is the 3-day, market-model cumulative abnormal return around the SASB report announcement date, and we use this measure to sort the sample into two portfolios (positive and negative).

	Mean(Pos 3-Day CAR)	Mean(Neg. 3-Day CAR)	Diff.	Std. Error	P-value
$CAR_{t-1,t+1}$	0.0214	-0.0186	0.0399***	0.0037	0.0000
$CAR_{t+2,t+30}$	0.0079	0.0033	0.0046	0.0101	0.6527
$CAR_{t+2,t+60}$	-0.0152	-0.0104	-0.0049	0.0083	0.5601

Table 11.
Types of Violations

We obtain a comprehensive data set of corporate violations from the Violation Tracker database of Good Jobs First's Corporate Research Project. Of this set, 6,497 violations occur within the time frame of our study and are committed by firms which can be matched to sufficient CRSP and Compustat data for our analyses. The majority of these violations relate to workplace safety and health violations, which are relevant to our analyses, because Workforce Health and Safety is a SASB disclosure topic. The second most common violation type is Environmental, followed by Employment, Discrimination, and Safety. The category *Other* contains violations from over 40 remaining categories, including violations relating to fraud, other financial violations, violations relating to corruption, and more.

	Violations
Workplace Safety & Health	3,230
Environmental	1,272
Employment*	421
Discrimination	207
Safety**	190
Other***	1,177
Total	6,497

* Other than those violations relating to employment discrimination

** Other than those violations relating to workplace safety & health

*** Contains violations from 40 remaining categories

Table 12.
Summary Statistics: Violations

For our analyses on the market reaction to violations, we use three samples. First, the overall sample of Violations obtained from Good Jobs First's Violation Tracker database. Second, we match the violations data to our SASB report sample. Of our 276 SASB reports, we find 153 relating to a violation that occurred in the year covered by the report. These violations are our subsample of SASB report-year violations. Finally, we construct a subsample of financially material violations. This subsample consists of violations where the implicated firm has at least \$1B market cap, and the value of the penalty is greater than 1% of the firm's market capitalization. This is the major penalties subsample.

Panel A: All Violations

	Mean	50%	S.D.	Min	Max
<i>Market Cap (\$B)</i>	50.541	12.089	118.448	-0.328	2,006.723
<i>Penalty Amount (\$M)</i>	11.791	0.016	196.624	0.000	8,001.000
<i>Penalty as a % of Mkt Cap</i>	0.102	0.000	1.691	-0.065	65.586
Observations	6497				

Panel B: SASB Report-Year Violations

	Mean	50%	S.D.	Min	Max
<i>Market Cap (\$B)</i>	47.449	27.100	69.140	0.276	399.117
<i>Penalty Amount (\$M)</i>	2.682	0.024	11.620	0.005	101.667
<i>Penalty as a % of Mkt Cap</i>	0.019	0.000	0.093	0.000	0.722
Observations	153				

Panel C: Major Penalties

Within the sample of firms with \$1B or greater market cap, penalties greater than 1% of market cap.

	Mean	50%	S.D.	Min	Max
<i>Market Cap (\$B)</i>	41.748	6.400	102.712	1.146	492.355
<i>Penalty Amount (\$M)</i>	1,138.348	126.300	2,064.833	15.079	8,001.000
<i>Penalty as a % of Mkt Cap</i>	4.468	1.824	7.611	1.001	38.165
Observations	43				

Table 13.

Analysis of Related Disclosures for Firms with Major Penalties

For the subsample of major penalties, we analyze additional disclosures relating to the violation. We check whether the alleged violation and (potential) penalty is disclosed in a standalone company press release, a Form 8-K, the concurrent Form 10-K (relating to the period in which the penalty is announced), and the previous Form 10-K (relating to the period prior to that in which the penalty is announced).

	Press Release	Form 8-K	Concurrent 10-K	Previous 10-K	Disclosed in at least 1 of these
Yes	27	29	42	39	43
Yes %	63%	67%	100%	91%	100%
No	16	14	0	4	0
No %	37%	33%	0%	9%	0%
Total	43	43	42*	43	43

*One firm had not yet published the concurrent 10-K

Table 14.**Stock Market Reaction to the Announcement of Violations in the Violations Tracker Database**

The following table reports results of event-study tests of market reaction to announcement of violations in the Violation Tracker database. $CAR_{t-1,t+1}$ is the 3-day, market-model cumulative abnormal return around the announcement date identified in the violation tracker database. Daily abnormal returns are calculated as the residual from regressing the firm's returns on the S&P500's returns from the 30 most recent trading days, inclusive, and are cumulated from $t - 1$ to $t + 1$. *Abnormal Volatility* is the squared value of $CAR_{t-1,t+1}$ for the violation announcement date divided by the average value for non announcement dates. This variable is defined so that its average value on non-announcement dates is 1. To seed the average volatility measure, we exclude the three-day trading windows around both SASB-report release dates and earnings release dates, and use a +/- 130-day window, following Beaver et al. (2020). *Abnormal Volume* is the mean of the trading volume (scaled by total shares outstanding) on each of the three days centered on the violation announcement date, minus the mean scaled trading volume during the non-announcement period, divided by the standard deviation of the same. To seed the mean and standard deviation for this measure, we exclude the three-day trading windows around both SASB-report release dates and earnings release dates, and use a +/- 130-day window, following Beaver et al. (2020). 95% confidence intervals are indicated in brackets below each parameter estimate. P-values for a two-sided t-test of the null hypothesis for each respective dependent variable are reported.

Panel A: All Violations

	(1)	(2)	(3)
	$CAR_{t-1,t+1}$	<i>Abnormal Volatility</i>	<i>Abnormal Volume</i>
	-0.001	1.132	0.070
	[-0.0022,0.0009]	[1.0606,1.2025]	[0.0476,0.0922]
Null Hypothesis	$\beta = 0$	$\beta = 1$	$\beta = 0$
P-Value	0.410	0.000	0.000
Observations	6,118	6,118	6,132

Panel B: SASB Report-Year Violations

	(1)	(2)	(3)
	$CAR_{t-1,t+1}$	<i>Abnormal Volatility</i>	<i>Abnormal Volume</i>
	-0.003	0.847	-0.111
	[-0.0079,0.0022]	[0.6527,1.0411]	[-0.2129,-0.0087]
Null Hypothesis	$\beta = 0$	$\beta = 1$	$\beta = 0$
P-Value	0.269	0.121	0.034
Observations	153	153	153

Panel C: Major Penalties

Within the sample of firms with \$1B or greater market cap, penalties greater than 1% of market cap.

	(1)	(2)	(3)
	$CAR_{t-1,t+1}$	<i>Abnormal Volatility</i>	<i>Abnormal Volume</i>
	0.007	1.091	0.041
	[-0.0062,0.0195]	[0.6381,1.5447]	[-0.2319,0.3143]
Null Hypothesis	$\beta = 0$	$\beta = 1$	$\beta = 0$
P-Value	0.300	0.686	0.763
Observations	43	43	43