Shareholder value implications of supply chain ESG: Evidence from negative incidents*

Xuanpu Lin[1]

Guoman She[1]

Aaron Yoon[2]

Haoran Zhu[3]

Abstract

Using a novel measure that captures negative ESG incidents at both listed and private suppliers, we provide large-scale evidence on the value implications of supply chain ESG. We find that firms with fewer supply chain ESG incidents exhibit higher future accounting performance and that this effect is stronger in the presence of more conscious customers and vulnerable supply chains. We also find that firms with robust supply chain ESG exhibit higher future stock returns and that this effect is more pronounced when information frictions are higher, which suggests that it takes time for the market to understand the value implications of supply chain ESG. Overall, we highlight the benefits of managing supply chain ESG and the decision usefulness of the related information.

Keywords: Supply Chain ESG, Accounting Performance, Stock Returns, Information Frictions

JEL Classification: G14, L23, M14, M40, Q54

* This paper was previously titled "Shareholder Value Implications of Supply Chain ESG Risk Management: Evidence from Negative Incidents." We thank Patricia Dechow (editor), Sandra Vera Muñoz (discussant) and two anonymous referees for helpful comments. We also thank Jaewon Choi, Alper Darendeli, Maria Ibanez, Soohun Kim, Robert Korajczyk, Ningzhong Li, Hao Liang, Chi-Yang Tsou, Hong Xiang, Liyan Yang, Luo Zuo (discussant), and workshop participants at the Accounting & Finance online seminar series (Universities of Bielefeld, Bonn, Dortmund, Wuppertal + WHU, Germany), 2023 Chinese Accounting Professors' Association of North America Conference, 2023 Conference of the Japanese Accounting Review, 2024 Hawaii Accounting Research Conference, 2024 Review of Accounting Studies Conference, CEIBS, INSEAD, KAIST, Seoul National University, Shanghai University of Finance and Economics, Southern University of Science and Technology, University of Hong Kong, University of Mannheim, and University of Oxford for helpful comments. We also thank RepRisk for sharing the data as well as insights about the development of RepRisk database. Yoon serves on the advisory board of RepRisk. Zhu acknowledges the financial support from the National Natural Science Foundation of China (No. 72402089). Any errors are ours.

[1] HKU Business School, University of Hong Kong, Hong Kong, China
[2] Kellogg School of Management, Northwestern University, Evanston, IL, USA
[3] College of Business, Southern University of Science and Technology, Shenzhen, Guangdong, China

1. Introduction

Firms collaborate closely with their supply chain partners to enhance operational efficiency, a relationship long recognized in business strategy (Porter 2008). However, supply chain is not merely a tool for efficiency but a complex and interconnected network that can transmit both economic shocks and firm practices (Acemoglu et al. 2012). Recent research (e.g., Schiller 2018; Dai et al. 2021) highlights the role of customers with strong environmental, social, and governance (ESG) commitments in shaping the ESG policies of their suppliers. These ESG-conscious customers not only choose suppliers who demonstrate robust ESG practices but also contribute to improving the ESG performance of those suppliers. As a result, a shift is occurring where firms are increasingly focused on both their own ESG performance and that of their suppliers. This shift is perhaps unsurprising, given that supplier ESG could represent a significant portion of a firm's overall ESG impact. For example, supply chain emissions, which are part of Scope 3 emissions, account for over 70% of the total greenhouse gas emissions by corporate issuers (Bloomberg 2023).

Supply chain ESG has attracted heightened attention from policymakers worldwide. Regulators have urged firms to address ESG issues at the suppliers and have implemented regulations mandating the disclosure of related information to investors (e.g., the United Kingdom enacted the Modern Slavery Act in 2015, and Germany enacted the Act on Corporate Due Diligence Obligations in Supply Chains in 2024). Despite this momentum and the studies that examine financial materiality of firms' ESG performance (e.g., Matsumura et al. 2014, 2024; Khan et al. 2016; Welch and Yoon 2023), researchers still know relatively little about whether managing ESG at the supply chain creates value for a firm and whether the information is decision-useful to investors, an important justification for mandating disclosure.

There are two important reasons for this gap. First, supply chain ESG risk is difficult to account for due to the complexity of supply chains and the multifaceted aspects of ESG performance (Ho et al. 2015; Pournader et al. 2020). Second, there is a lack of granular data on supply chain networks and the ESG performance of suppliers, especially that of private suppliers. We fill this gap by investigating the value implications of supply chain ESG and whether investors understand these implications in a timely manner.[1] Specifically, we develop a new measure of supply chain ESG that captures the performance of public and private suppliers and provide large-scale evidence on its link to future accounting performance and stock returns.

Our main prediction is that having robust supply chain ESG creates shareholder value. Nonetheless, we start by highlighting the reasons to expect otherwise. For example, supply chain ESG may not increase value because responsible sourcing and monitoring suppliers' adherence to ESG standards (e.g., through supplier certification and audit) are costly. This would likely increase operational costs, including input costs, at least in the short run (Guo et al. 2016; Chen and Lee 2017) and erode a firm's competitive advantage, especially if consumers will not pay the premium (*Financial Times* 2021).

On the other hand, supply chain ESG could create value by reducing the odds of supplier incidents related to ESG that create brand and reputation damage (Lee et al. 2012; Christensen et al. 2023; Houston et al. 2024). Further, ESG adversities at suppliers might destabilize supply chains, as firms might face stakeholder pressure to disassociate from suppliers following heightened ESG risk (Darendeli et al. 2022; Bisetti et al. 2024; Pankratz and Schiller 2024). This not only would result in substantial adaptation costs but also impair the ability to procure inputs to

[1] For the purpose of our analysis and following the literature that views ESG as a tool to mitigate downside risk (Hoepner et al. 2024; Sautner and Starks 2023), we define supply chain ESG as "endeavors to mitigate environmental, social, and/or governance aspects of suppliers' operations that could potentially cause a reduction in actual or expected value and reputation of the focal firm."

fulfill purchase orders in time (Lefevre et al. 2010). Furthermore, the enforcement of supply chain ESG-related regulation also exposes firms with irresponsible sourcing to significant supply chain adaptation costs (Hsu et al. 2023; Dai et al. 2024).[2] In essence, we expect good supply chain ESG to help firms not only increase revenue but also reduce operational costs, thus improving future financial performance.

While we expect supply chain ESG to enhance value, information frictions may prevent timely incorporation of supplier ESG information into stock prices. Specifically, supply chains are opaque, as firms are generally not mandated to reveal supplier identities and many suppliers are located outside the U.S., with news frequently only covered by local media outlets. So the information acquisition and integration costs for investors would likely be high (Bae et al. 2008; Brochet et al. 2016). As such, supply chain ESG information may not be priced in immediately and may lead to future abnormal stock returns.

To test the above predictions, we create a measure that captures the realized performance of supply chain ESG management from 2011 through 2021. Specifically, we use the number of ESG incidents involving the firm's suppliers over a 12-month window preceding the focal year and then divide it by the number of suppliers to control for the size of the supply chain network.[3] This measure is constructed by using data from FactSet Revere, which contains comprehensive information about supply chain networks (Bae et al. 2019; Gofman et al. 2020), and data from RepRisk, which collects negative ESG incidents for both public and private firms. Our end product is a news-based measure of negative incidents, which could be better than ESG ratings that are

[2] For example, the 2008 amendments to the Lacey Act prohibit import of illegal timber. The 2010 California Transparency Act requires firms to disclose how they conduct due diligence to combat suppliers' human right abuses, inducing firms to move away from suppliers with poor human right records (She 2022).

[3] This measure in essence assumes that supply chain ESG performance is a product of both the inherent supply chain ESG risk and the related risk management endeavors. In this regard, a firm can achieve better performance—reducing the frequency of supplier incidents—by disassociating itself from risky supply chains, enhancing its investment to monitor and discipline suppliers, or both.

often a weighted average of various categories based largely on firm-initiated disclosure (Chen, Li, Mao, and Yoon 2025).

We begin by examining the association between supply chain ESG and future profitability. We find a negative relation between the frequency of supply chain ESG incidents and subsequent return on assets (*ROA*). This result is after controlling for current period ROA as well as a host of other firm covariates. It suggests that supplier ESG incidents have an incremental negative effect on future profitability. On average, an interquartile increase in the relative frequency of supplier ESG incidents is associated with a 2.2% decline in future ROA relative to the sample mean.

Next we conduct two sets of analyses to illuminate the mechanisms underlying the relationship between supply chain ESG and future profitability. The first set of results explore the cross-sectional variation of the negative impact of supplier ESG incidents on future profitability. First, we expect the revenue creation effect to be stronger when consumers are more willing to purchase or pay a premium for products manufactured following responsible sourcing policies. As predicted, we find that the supply chain ESG–future profitability relation is more pronounced when customers are more ESG-conscious. Second, the input management channel implies that supply chain ESG is value-enhancing when supplier incidents are more likely to disrupt supply chains. Consistent with this notion, we find that supplier ESG incidents have a greater negative incremental effect on future profitability when supply chains are more vulnerable to ESG shocks.

Our second set of analyses investigates the impact of supply chain ESG on a firm's sales generation (i.e., downstream impact) and input management (i.e., upstream impact). Consistent with supply chain ESG empowering revenue expansion, we find that firms with stronger supply chain ESG exhibit faster asset turnover. Moreover, these firms can better procure adequate inventories and thus have increased capacity to convert purchase orders into future revenue.

Overall, the evidence suggests that robust supply chain ESG enhances the capacity to both attract customers and procure inventory to fulfill purchase orders.

Next we examine capital market consequences of supply chain ESG. We assign firms into quartiles based on supply chain ESG incidents relative to their industry peers, recognizing that supply chain structures and fundamental ESG risk embedded in supply chains can vary across sectors (Hsu et al. 2023; Wu 2024). We estimate the alpha of high-minus-low strategy that takes a long position in firms with the fewest supply chain ESG incidents and a short position those with the most such incidents, controlling for the five factors (Fama and French 2015). We find that the supply chain ESG signal predicts next year's abnormal stock returns. Specifically, the value-weighted (equal-weighted) approach earned a statistically significant alpha of 4.68% (2.64%) per year.

The inferences are similar when we conduct Fama and MacBeth (1973) and panel regressions (i.e., including an additional set of firm characteristics, and/or fixed effects). Moreover, we show that information friction could be hindering the timely incorporation of supply chain ESG signal. Specifically, we find that stock prices are less likely to incorporate the signal in a timely manner when focal firms have low supply chain transparency and when a larger proportion of suppliers are located outside the United States. Finally, we find that the abnormal stock returns decline over time and become insignificant starting the second year following the portfolio formation.

We also exploit the granularities of our data to understand how the effect of supply chain ESG varies with the characteristics of supplier ESG incidents and assess the robustness of our results. There are several notable findings. First, we find that our results are stronger when incidents are more severe and financially material. Second, we classify incidents into E, S, G, and

cross-cutting categories and find that all categories contribute to the main phenomenon. A further breakdown shows that adverse effects are strongest when incidents likely create negative externalities for local communities (e.g., landscape and community impacts) or impact downstream firms (e.g., controversial products). Third, we find that our results are the most evident in sectors more heavily dependent on global supply chains (e.g., manufacturing and business equipment). Last, we find that our main inferences are robust to alternative approaches to measure supply chain ESG (e.g., using an index that considers incidents' severity or that excludes suppliers with recurring incidents).

Our paper contributes to several areas of the literature. First, we contribute to the literature measuring and highlighting the value relevance of supply chain risk. Prior literature points out that supply chain risk, despite being a well-developed theoretical concept, has been difficult to quantify (Ho et al. 2015; Pournader et al. 2020). Researchers have tried to proxy for supply chain risks (e.g., Hendricks and Singhal 2003, 2005; Wu and Birge 2015; Bray et al. 2019; Wu 2024) and have linked supply chain shocks to negative short-term market reactions (Hendricks and Singhal 2003; Liu et al. 2018; Kim et al. 2019; Hendricks et al. 2020). Also, a few researchers have highlighted the long-term value implications of global sourcing strategies and supply chain networks (Wu and Birge 2015; Jain and Wu 2023). We add to this literature by constructing a new measure that captures a firm's supply chain ESG and demonstrating its value implications for shareholders.

This contributes to the literature that has documented the usefulness of supply chain partners' financial performance to stock return prediction (Cohen and Frazzini 2008; Pandit et al. 2011), earnings forecasts (Luo and Nagarajan 2015; Hertzel et al. 2008; Huang et al. 2023), credit risk assessments (Files and Gurun 2018), and fraud detection (Li et al. 2023). We add by offering large sample evidence on the value creation effect of supply chain ESG, a crucial aspect of

nonfinancial performance that matters to both investors and policymakers. Our findings inform regulators and investors about the potential impact of supply chain ESG management and disclosures.

Second, we extend the literature that links firm ESG efforts and shareholder value. For example, papers have highlighted financial materiality of firm ESG efforts (Matsumura et al. 2014; Khan et al. 2016; Bolton and Kacperczyk 2021, 2023; Hsu et al. 2023; Welch and Yoon 2023; Sautner et al. 2023a, 2023b; Matsumura et al. 2024). We extend this literature by highlighting that robust ESG at the supply chain generates value for a focal firm. Our results suggest that supply chain transparency initiatives could facilitate more timely incorporation of supply chain ESG information into stock prices and have implications for regulations.

Third, we extend the literature that studies supply chain ESG (e.g., Guo et al. 2016), which has been recently recognized as an important ESG issue that has a large impact on society. Papers (e.g., Schiller 2018; Darendeli et al. 2022; She 2022; Chen, Su, Tian, Xu, and Zuo 2025) have found that the supply chain can be an important transmission channel of positive ESG practices. For example, Dai et al. (2021) present evidence that links collaborative supply chain ESG to positive customer outcomes, such as improved sales growth. On the other hand, Dai et al. (2024) and Lu et al. (2023) find that supply chains can also be used to outsource toxic practices. We add to this stream of papers by showing the benefits of a robust supply chain ESG.

2. Predictions

2.1. Supply chain ESG and future profitability

We posit that supply chain ESG would impact future profitability by influencing a firm's revenue generation and operational efficiency. First, customers may value responsible sourcing

either due to their ESG preferences or endeavors to avoid the propagation of upstream ESG adversities along supply chains (Dai et al. 2021). Studies have shown that the ESG performance of suppliers can significantly affect the value of their products, as consumers are often willing to pay a premium for products that have a fair-trade label and come from sustainable sources (Eichholtz et al. 2010; Hainmueller et al. 2015; Jacobs and Singhal 2020; Gao and Souza 2022). In contrast, ESG-related supplier adversities often harm the brand and reputation of the focal firm, which could spur a consumer backlash (Houston et al. 2024). Moreover, as upstream ESG adversities often propagate along supply chains and lead to downstream consequences (Lee et al. 2012; Chen and Lee 2017), corporate customers have incentives to procure from suppliers with more responsible sourcing policies. Supporting this notion, Merit Medical System states that certain key customers require medical device companies to implement an audit program regarding their ESG as a prerequisite to selling products to them.[4] We thus posit that superior supply chain ESG could enable firms to bolster revenues by attracting ESG-conscious consumers, while worse supply chain ESG performance could lead to consumer backlash.

Second, ESG issues among suppliers could destabilize supply chains and increase operating costs. Studies have shown that, following the revelation of ESG incidents or heightened climate risk among suppliers, firms experience disruption in supply chains and face pressure to restructure their supply chains (Darendeli et al. 2022; Bisetti et al. 2024; Pankratz and Schiller 2024). Supply chain disruption and adaptation not only increase focal firms' operating costs but also can impair their ability to procure inputs punctually (Barrot and Sauvagnat 2016; Carvalho et al. 2021). Therefore, a robust supply chain ESG could curb supplier ESG incidents and lead to more stable supply chains. It also insulates firms from ESG-related supply chain regulations that

[4] See https://www.merit.com/wp-content/uploads/2018/04/2017-Annual-Report-Merit-Medical-Systems-Inc..pdf (page 20).

could expose firms to substantial adaptation costs (Hsu et al. 2023). In sum, strong (weak) supply chain ESG enables firms to achieve superior future profitability by bolstering (reducing) revenues and lowering (increasing) operating costs. These discussions lead to the following prediction:

Prediction 1: Supply chain ESG is positively associated with future profitability.

Note that this prediction is not without tension. The implementation of responsible sourcing requires companies to allocate significant resources to ensuring suppliers' compliance with ESG norms, potentially escalating input costs and operational expenses excessively, at least in the short term (Guo et al. 2016; Chen and Lee 2017). Moreover, higher operational and input costs due to responsible sourcing could erode a firm's competitive edge if customers will not pay a premium. These factors might lead to a tenuous or even negative association between a robust supply chain ESG and future profitability.

Given these counteracting factors, we also identify scenarios where the incremental value of supply chain ESG likely outweighs the costs of maintaining responsible sourcing, leading to a more detectable positive association between a robust supply chain ESG and future profitability (if any). The revenue creation effect of supply chain ESG hinges on the premise that consumers are on average more willing to pay a premium for products manufactured following responsible sourcing policies and would move away from products identified with adverse supply chain ESG issues. In contrast, investing in supply chain ESG might generate a net loss if most consumers do not emphasize ESG. Thus, we expect the positive association between supply chain ESG and future profitability to strengthen when firms' consumers are more ESG-conscious. This leads us to the next prediction:

Prediction 2A: The positive association between supply chain ESG and future profitability is more pronounced when consumers are more ESG conscious.

Supply chain ESG could insulate firms from supply chain disruptions that would increase

supply chain adaptation costs and erode operating efficiency. Due to the heterogeneity of supply chain collaborations and stakeholder preferences, the disruption risk induced by supplier ESG incidents would likely vary across firms. For example, Barrot and Sauvagnat (2016) find that natural disasters disrupt supply chains more severely when the inputs are specialized. Bisetti et al. (2024) find that the effect of supplier ESG incidents on supply chain disruptions varies with shareholder ESG sensitivity. So, in the cross-section, we expect supply chain ESG to create greater incremental value in maintaining operating efficiency when supplier ESG incidents are more likely to disrupt the supply chain. This leads us to the following prediction:

Prediction 2B: The positive association between supply chain ESG and future profitability is more pronounced when the supply chain is more vulnerable to supplier ESG adversities.

2.2. Supply chain ESG and future stock returns

Next we explore the effect of supply chain ESG on future stock returns. The stock return test is a joint test on whether supply chain ESG creates value for shareholders and the timely incorporation of supply chain ESG information in stock price. Building on Prediction 1 that supply chain ESG can enhance future profitability, we expect supply chain ESG to increase stock prices, as stock price movement reflects cash flow news (Campbell and Shiller 1988; Vuolteenaho 2002; Richardson et al. 2012; Mao and Wei 2016).

While we expect a value creation effect of supply chain ESG, information frictions may prevent the prompt incorporation of supplier ESG information into stock prices. To gauge a firm's supply chain ESG performance, investors need to collect information about both the identities of suppliers and their ESG information. However, supply chains are opaque, as firms are not mandated to disclose suppliers' identities, and they lack incentives to voluntarily disclose that information (Ellis et al. 2012). This opacity could undermine the investors' identification of the

firms' suppliers and their ESG information.

Moreover, most suppliers are located out of the United States. Their incidents are often covered by local news outlets and even written in languages besides English, inhibiting investors' acquisition of the information (Bae et al. 2008; Brochet et al. 2016). These information frictions could impair investors' ability to promptly acquire and integrate supply chain ESG signals. We thus expect the market to exhibit a delayed response to supplier ESG incidents, leading to a detectable association between supply chain ESG and future stock returns.

Conversely, there are two primary reasons why we might not anticipate supply chain ESG to influence future stock returns. Firstly, as previously mentioned, the benefits of supply chain ESG, including boosting revenue and operational efficiency, might not outweigh the costs (e.g., increased input costs). Consequently, supply chain ESG may not increase future cash flows. Secondly, given the heightened market attention to supply chain ESG, investors, particularly sophisticated ones, may have allocated resources to gather and process supply chain ESG information. This could result in the prompt integration of this information into stock prices. We thus make the following predictions:

Prediction 3: Firms with stronger supplier ESG will exhibit higher future stock returns.
Prediction 4: The positive association between supplier ESG and future stock returns is more pronounced when information frictions are high.

3. Sample, measurement, and descriptive statistics

3.1. Measure of supply chain ESG

We measure the performance of supply chain ESG using the frequency of ESG-related incidents. This follows the spirit that supply chain ESG is a product of fundamental ESG risk inherent in supply chains as well as the firms' investment in supply chain ESG risk management.

Therefore, more frequent supplier incidents suggest that firms fail to monitor risk in their supply chains, implement disciplinary practices, or both.

To identify suppliers' identities, we obtain the list of tier-1 suppliers from the FactSet Revere database, which, according to the literature, provides the most comprehensive coverage of supplier-customer relationships (Gofman et al. 2020). This dataset identifies a firm's suppliers from various sources, including firm disclosure, analyst reports, investor presentations, supply contracts, and press releases. For each supplier–customer relationship, FactSet Revere collects and verifies the starting and ending dates of the relationships, which allows us to track the point-in-time supplier list (Pankratz and Schiller 2024).

We gather ESG incident data from RepRisk to measure supplier ESG. RepRisk collects ESG incidents for over 220,000 private and public companies by screening over 100,000 public sources, including media, regulatory, and commercial documents. After extracting incidents from these sources, the analyst team conducts quality checks and regulatory reviews, identifies the affected firms, and records the novelty (i.e., newness) of each incident.[5] RepRisk classifies these incidents into 28 issue topics within the scope of environmental, social, and governance. (See Appendix B for details.) Cross-cutting incidents refer to issues that encompass more than one category (e.g., social and governance).

The RepRisk database provides data starting in 2007. However, according to our conversation with RepRisk, it underwent significant modifications at its inception and achieved stability in coverage since 2011. Specifically, it only covered four languages (German, French, English, and Spanish) in 2007; by 2011, it expanded to 14 languages. Moreover, in 2011, RepRisk introduced developments related to machine learning alongside an expansion of the scope of ESG

[5] We only keep the new incidents (i.e., novelty = 2).

issues. Consequently, our analysis commences from 2011 onward to mitigate concerns of measurement errors and enhance the comparability of ESG metrics over time.

We merge RepRisk and FactSet Revere using a two-step approach. For public suppliers, we rely on the International Securities Identification Number (ISIN). For private suppliers (i.e., cases where an ISIN is unavailable), we rely on a fuzzy name-matching algorithm. We then measure the realized performance of supply chain ESG (*SuppESG Incident*) for each firm-year using the total number of suppliers' ESG incidents during a 12-month window preceding the year, which is then scaled by the number of suppliers to account for the size of the supply chain network. So a higher value of the *SuppESG Incident* indicates weaker supply chain ESG.

3.2. Sample construction and distribution

Our sample selection starts with all U.S. firms covered by both the CRSP and Compustat databases from 2011 to 2021. We additionally require firms to be covered by the FactSet Revere database to identify their supplier lists. Next we exclude utilities (i.e., SIC between 4900 and 4999), financial firms (i.e., SIC between 6000 and 6999) and firms without a Fama-French 10 classification. We also require firms to have sales larger than or equal to $1 million and exclude observations with missing control variables. Panel A of Table 1 outlines sample selection procedures. Our final sample in our Fama-MacBeth and panel regressions contains 13,622 (164,060) firm-year (firm-month) observations.[6]

Panel B of Table 1 reports the distribution of the topics of supplier ESG incidents as classified by RepRisk. Many environmental incidents relate to landscape (7.29%) and local

[6] Our supply chain ESG measure is between 2011 and 2021, so our returns analyses are from July 2012 to June 2023. As we require non-missing *ROA* in *t+1* for financial performance analyses (i.e., firm-year sample), the number of monthly return observations (164,060) is slightly higher than the number of firm-year observations (13,622) multiplied by 12. Our results are robust when we impose the same sample restriction for the return analyses.

pollution (4.98%), whereas social incidents are concentrated in impacts on the community (7.82%), human rights abuses (9.14%), and poor employment conditions (5.37%). Also, many incidents relate to violations of national legislation (12.95%). Panel C displays the distribution of our sample by industry. The industries with the most observations are business equipment (24.53%), manufacturing (16.18%), wholesale, retail, and some services (laundries, repair shops) (14.74%), and healthcare, medical equipment, and drugs (14.63%).

3.3. Descriptive statistics

Panel A of Table 2 presents the summary statistics about our supply chain ESG measure and firm characteristics. The mean value of *SuppESG Incident* is 1.576, indicating that, on average, a supplier experiences 1.576 ESG incidents in a year. Panel B of Table 2 further displays the distribution of *SuppESG Incident* across Fama-French 10 industries. The top three industries with the most supply chain ESG incidents include telephone and television transmission, business equipment, and wholesale, retail, and some services (laundries, repair shops), likely because their upstream industries are labor or pollution-intensive.

We also report summary statistics for a series of firm characteristics. (See Appendix A for detailed definitions.) A focal firm on average experiences 0.947 ESG incidents in a year. A median firm has a market capitalization of \$1,507 (= $e^{7.318}$) million and a book-to-market ratio of 0.398. The sample firms on average have a return on assets ratio of 9.4%. These statistics are largely consistent with those reported in prior studies (e.g., Dai et al. 2021).

4. Research design and results

4.1. Supply chain ESG and future accounting performance

4.1.1. Baseline results

To test our first prediction regarding the association between supply chain ESG and future accounting performance, we estimate the following regression on a firm-year panel:

$$Perf_{it+1} = \beta_0 + \beta_1 Log\ SuppESG\ Incident_{it} + \beta_2 Perf_{it} + \beta_3 Z_{it} + \varepsilon_{it}, \quad (1)$$

where *i* and *t* index firm and year, respectively. Our key performance measure (*Perf*) is *ROA*.[7] *Log SuppESG Incident* is the natural logarithm of one plus the intensity of supplier ESG incident. We use *Log SuppESG Incident* to introduce richer cross-sectional and time-series variations in supply chain ESG and normalize the skewness of *SuppESG Incident*. Our inference is quantitatively and qualitatively similar without the log transformation or if we replace *Log SuppESG Incident* with two indicator variables for high and low portfolios, respectively.

We control for the current period *ROA*, following Sloan (1996) and Richardson et al. (2005), which allows us to identify the incremental effect of supplier ESG incidents on variation in future profitability over current period profitability. In addition, we control for the natural logarithm of market capitalization (*Size*), the book-to-market ratio (*BM*), the natural logarithm of one plus stock returns (*Return*), the natural logarithm of average stock price (*PRC*), the natural logarithm of average trading volume (*Vol*), capital expenditure divided by sales (*CAPX*), and the natural logarithm of one plus the frequency of ESG incidents of the focal firm (*Log Firm Incident*). We further include year fixed effects and Fama-French 10 industry fixed effects to control for time-varying macro factors and industry characteristics, respectively. Standard errors are clustered

[7] In Online Appendix 1, we document similar results when we weigh each observation by firm size (i.e., market capitalization) or exclude microcaps (i.e., firms with market caps below the bottom 20% of NYSE firms) from our sample.

by firm as the key variable of our interest, *Log SuppESG Incident*, is constructed at firm level.[8]

We report the results in Table 3. Column (1) includes ROA_t as the only control variable. The coefficient of *Log SuppESG Incident* is −0.003 and statistically significant at the 1% level. The results remain robust with the inclusion of firm controls in Column (2). *Log SuppESG Incident* continues to load significantly negatively. An interquartile increase in *Log SuppESG Incident* (1.012=ln(1+1.750)) is associated with a reduction of *ROA* by 0.002 (= −0.002×1.012). This corresponds to 2.2% of the average *ROA* and 4.8% of the average change in *ROA* (0.042, omitted for brevity). The result suggests that strong supply chain ESG helps firms achieve superior future performance, which is consistent with Prediction 1.

4.1.2. Exploring the potential mechanisms

In this subsection, we examine how supply chain ESG is linked to future profitability. We propose two channels: (i) attracting pro-social customers and thus enhancing revenue generation and (ii) better managing inputs. We conduct two sets of analyses to explore these channels.

We explore the heterogeneity in the association based on customer ESG preference and supply chain stability. First, we measure corporate customers' ESG preferences (*Customer ESG*) using the average ESG rating from RepRisk across all customers for each focal firm-year. We then partition the sample based on whether *Customer ESG* exceeds the median. Columns (1) and (2) of Table 4 Panel A report the results.[9] The coefficient on *Log SuppESG Incident* is significantly more negative in the subsample with high customer ESG rating than that in the subsample with low customer ESG rating. This supports Prediction 2a that supply chain ESG has a greater impact on future profitability when customers are more ESG conscious.

[8] Our results are robust to two-way clustering at firm and year levels.
[9] The sample size in this test is slightly reduced due to the availability of customer identities from FactSet.

In Columns (3) and (4) of Table 4 Panel A, we examine the role of supply chain stability with the prediction that the effect of supply chain ESG on profitability would strengthen when it influences supply chain stability more. We measure the vulnerability of supply chains to ESG shocks based on the realized supplier turnover rate following supplier ESG incidents.[10] Specifically, we compute the fraction of suppliers excluded from the focal firm's supply chain in a two-year window following year t and then partition the sample based on the median value.[11] The results show that the negative association between supply chain ESG and future profitability is concentrated in the subsample where supply chains are more vulnerable to ESG shocks. Confirming Prediction 2b, this result suggests that the harm of supply chain ESG incidents on profitability is partially attributable to reduced supply chain stability.

In our second set of analyses, we analyze the effect of supply chain ESG incidents on firms' sales generation and input management. To study the effect on sales generation, we replace the performance measure (*Perf*) in Eq. (1) with asset turnover ratio (i.e., the ratio of sales to assets, denoted by *ATO*). As shown in Column (1) of Table 4 Panel B, the coefficient estimate on *Log SuppESG Incident* is -0.009 and significant at the 1% level. This suggests that an interquartile increase in *Log SuppESG Incident* (1.012) reduces *ATO* by 0.009. This is roughly 1% of average *ATO* and 8.0% of its average change (0.114, not tabulated for brevity).

To study how input management is impacted, we conduct two sets of analyses. First, we estimate Eq. (1) using the ratio of inventory to assets (*Inventory*) as the performance measure (*Perf*). Column (2) of Table 4 Panel B shows that the coefficient estimate on *Log SuppESG Incident* is -0.001 and significant at the 1% level. This suggests that supplier ESG incidents are

[10] As a robustness test, we also develop an ex ante measure based on the average turnover rate following supplier ESG incidents for all firms in the same industry before the current year, assuming that the supply chain sensitivity to ESG shocks are similar among firms in the same industry. The results are robust using this approach.
[11] The sample size decreases, because we require firms to have supplier information for year t to t+2.

associated with supply chain disruption and inventory shortage. This suggests that an interquartile increase in *Log SuppESG Incident* (1.012) reduces *Inventory* by 0.001. This is roughly 1% of average *Inventory* and 6.3% of its average change (0.016, not tabulated for brevity).

Furthermore, we investigate whether inventory shortage impairs the focal firms' ability to fulfill purchase orders. Following prior studies, we use the change in order backlogs to proxy for purchase orders and examine whether supply chain ESG performance affects firms' ability to fulfill purchase orders (Rajgopal et al. 2003; Chang et al. 2018). Specifically, we regress *Sales Growth* in the following year on the change in order backlogs (*ΔPO*) from year t-1 to year t, *Log SuppESG Incident*, and their interaction. Column (3) of Table 4 Panel B shows a significantly positive coefficient on *ΔPO*, which is consistent with the idea that purchase order leads to greater future revenue (Rajgopal et al. 2003). However, *Log SuppESG Incident*× *ΔPO* is negative and significant, suggesting that supply chain ESG incidents impair focal firms' ability to procure inputs to fulfill purchase orders, therefore weakening the positive association between purchase order change and future sales growth. Overall, results in Columns (2) and (3) of Table 4 Panel B support the argument that supplier ESG incidents impair firms' input management efficiency due to increased supply chain instability.

4.2. Supply chain ESG and future stock returns

4.2.1. Does the market understand the value implications of supply chain ESG?

In this subsection, we test Predictions 3 and 4 by investigating whether the market understands that supply chain ESG can enhance future profitability. We begin by examining the association between supply chain ESG and cross-sectional stock returns. Because acquiring and processing supply chain ESG information is likely very costly, we posit that the market would

exhibit a delayed response to supplier ESG incidents, leading to a detectable association between supply chain ESG and future stock returns.

To test this prediction, we construct quartile portfolios based on our measure of supply chain ESG. Because the fundamental ESG risk of the supply chain can vary considerably across industries, we sort firms within their corresponding Fama-French 10 industries. This allows us to account for industry-specific dynamics that may be confounded with ESG factors (e.g., Hsu et al. 2023; Koijen et al. 2024) and the systematic differences in key factor loadings across industries (e.g., Cohen et al. 2003).[12]

We construct portfolios at the beginning of July of t+1 using *SuppESG Incident* measured in the base year and hold the portfolios for twelve months.[13] The low (high) portfolio contains firms with the least (most) supply chain ESG incidents in the 12 months preceding the base year. We then perform the following calendar time portfolio regression:

$$R_{it} = \alpha_{it} + \beta_{MKT} MKT_t + \beta_{SMB} SMB_t + \beta_{HML} HML_t + \beta_{RMW} RMW_t + \beta_{CMA} CMA_t + \varepsilon_{it}, \quad (2)$$

where *R* is the portfolio *i*'s value-weighted return in month *t* in excess of the risk-free rate. *MKT* is the market excess return in month *t*. *SMB* and *HML* are the Fama and French (1993) size and book-to-market factors, respectively. *RMW* and *CMA* are the Fama and French (2015) profitability and investment factors, respectively. α is the intercept that captures the abnormal risk-adjusted return. Standard errors are estimated following Newey and West (1987), which allows ε to be heteroskedastic and serially correlated.

Table 5 presents the results. Panel A of Table 5 first reports the average firm characteristics across the quartile portfolios. Firms in the high portfolio on average experience 4.816 incidents

[12] In our analysis, we adjust for Fama-French 10 industries to mitigate concerns that a more granular classification could limit intra-industry variation in supply chain ESG. Our results remain robust when using alternative industry classifications, such as Fama-French 12, Fama-French 17, and two-digit NAICS industries.
[13] Our inferences are similar if we start the portfolio construction from four month following the fiscal year-end.

per supplier, while those in the low portfolio exhibit 0.010 incidents per supplier. Firms in the low portfolio tend to have fewer ESG incidents themselves, which is consistent with the assortative matching between supplier and customer documented by Dai et al. (2021). Interestingly, we find that firms in the low and high portfolios are similar in terms of size (6.644 vs. 6.829), book-to-market ratio (0.539 versus 0.561), and capital expenditure (0.239 versus 0.240).[14]

Panel B of Table 5 reports the results from the portfolio returns test. We first present the results using a value-weighted approach. We find that holding the low portfolio (i.e., the group of firms with the fewest supplier ESG incidents) yields an annualized alpha of 1.992% (t = 2.110).[15] In contrast, holding the high portfolio (i.e., the group of firms with the most supplier ESG incidents) yields an annualized alpha of −2.688% (t = −1.760). In sum, taking a long/short position earns an annualized alpha of 4.680 % (t = 2.809). These results suggest that strong supply chain ESG predicts stock returns. For the equal-weighted approach, we follow the literature and exclude microcaps from our sample (Fama and French 2008; Green et al. 2017; George et al. 2018; Hou et al. 2020).[16] The annualized hedge portfolio alpha is 2.640 % (t = 2.599), which again shows that firms with the fewest supplier incidents significantly outperform those with the most.[17]

[14] The number of observations in each portfolio is not equal because in certain industry-years, the majority of observations have zero supply chain incidents, causing these observations to be grouped into the low portfolio.
[15] We calculate the annualized alpha by multiplying the monthly alpha by 12.
[16] We follow the literature (e.g., Green et al. 2017; George et al. 2018) to mitigate the impact of microcaps by removing the firms with market caps below the bottom 20% of NYSE firms for equal-weighted approach. The removed firms contribute to 31.5% of the total number of stocks but only 0.82% of market cap in our sample. They have 5.7 suppliers on average, compared with 19.4 for the rest of the sample. We present the equal-weighted portfolio results including microcaps in Online Appendix Table A2.
[17] We follow Green et al. (2013) and select 10 return predictive signals that are the most correlated with our supply chain ESG signal to address the concern that supply chain ESG-return relation could be driven by omitted return predictive signals. These return predictive signals are selected from the orthogonalizing regression wherein we regress the long-short return based on supply chain ESG on the return of a pool of 153 return predictive signals in the United States (Jensen et al. 2023). We select 10 return predictive signals that generate the highest adjusted R-squared. The alpha remains significantly positive (annualized value- and equal-weighted alphas of 3.912% (t = 2.402) and 1.944% (t = 2.000), respectively). We also assess the robustness of our findings to alternative risk factor models (i.e., three-factor model (Fama and French 1993), four-factor model (Carhart 1997), and Q-factor model (Hou et al. 2015)) and find that the annualized alpha of the low-minus-high portfolio is similar (both economically and statistically) to our main results. We omit presenting these results for brevity.

We further supplement the factor model approach using both Fama-MacBeth and panel regressions, controlling for firm characteristics that could be correlated with both future returns and supply chain ESG. We use the excess monthly return for firm *i* for each month beginning from July of year t+1 to June of the next year (t+2) as the dependent variable. All other variables are as in Eq. (1). The results from value- and equal-weighted Fama-MacBeth regressions are reported in Columns (1)–(2) of Table 6. For value-weighted regression, the weight is set to market capitalization (deflated by CPI), though our results are not sensitive to CPI-deflation. For equal-weighted regression, we again exclude microcaps. The coefficient on *Log SuppESG Incident* is significantly negative for both equal- and value-weighted regressions. This is consistent with the results presented in Table 5 Panel B. The results from value- and equal-weighted OLS regressions are reported in Columns (3)–(4). The coefficients on *Log SuppESG Incident* continue to be significantly negative in both columns (*coef.* = −0.249, t = −3.071; *coef.* = −0.117, t = −2.304, respectively). Overall, our results demonstrate that firms with a robust supply chain ESG have higher future stock returns, confirming Prediction 3.

4.2.2. Information frictions and delayed market reactions

We next test Prediction 4, which posits that information frictions inhibit investors from identifying a firm's suppliers and measuring the performance of supply chain ESG. This could result in a delayed market reaction. To test this, we conduct cross-sectional tests based on the extent of information frictions.

First, we measure the extent of supply chain opacity using FactSet Revere, which identifies a firm's suppliers from either its public disclosure or the disclosures of its suppliers. It is likely costly for investors to acquire supply chain information if they have to search for that information from among a firm's many suppliers. Following Shi et al. (2023), we measure supply chain opacity

using the fraction of the firm's suppliers that are disclosed *only* by the suppliers.[18] We then divide the sample into two based on the median supply chain opacity. We then run the Fama-MacBeth on each subsample. We present value-weighted Fama-MacBeth regressions for brevity and to better capture the economic importance of firms (Hou et al. 2020; Harvey and Liu 2018).[19] In Table 7 Panel A, we find that the association between supply chain ESG and future return is concentrated among firms with more opaque supply chains, and the difference in the coefficients on *Log SuppESG Incident* between the two subsamples is statistically significant.

Next we measure supply chain complexity using the fraction of suppliers that are outside the United States. The presence of foreign suppliers would likely increase information acquisition and integration costs, because it is costlier for investors to identify suppliers and assess their ESG performance when the news about them is not written in English. For each focal firm-year, we compute the fraction of foreign suppliers. We then divide the sample into two subsamples based on supply chain complexity. Table 7 Panel B presents the results, showing that the coefficient on *Log SuppESG Incident* is significantly larger in the subsample with higher supply chain complexity than in the one with lower complexity. Overall, the results suggest that information frictions impede the assessment and pricing of supply chain ESG.

We further investigate the persistence of alpha from supply chain ESG. Consistent with the mispricing story, we find that the excess return declines over time. In Panel C of Table 7, we present the monthly alphas for the 1 to 12, 13 to 24, and 25 to 36 months following portfolio formation. We find that the monthly alphas become insignificant starting from the second year after portfolio formation. This suggests that the market slowly incorporates supply chain ESG

[18] We find that on average 50% of suppliers are not disclosed by the focal firm.
[19] In untabulated analyses, we continue to find that the positive supply chain ESG-return relation is concentrated in the subsample with high information frictions using equal-weighted Fama-Macbeth approach.

signals into stock prices but, at the same time, can understand the value implications of this signal after one year. Overall, the results in this subsection confirm Prediction 4.

4.3. Additional tests

4.3.1. Test using the granularities of the RepRisk data

In this subsection, we take advantage of the granularities of the supply chains and ESG incident databases to better understand how the effect of supply chain ESG varies with the characteristics of supplier ESG incidents. First, we investigate whether our main finding varies by incident type. We categorize ESG incidents into four types: environmental, social, governance, and cross-cutting. We then construct separate supply chain ESG measures for each type of incident. The results are presented in Row (i) of Table 8 Panel A. All four types of incidents in general hurt firms' future ROA and returns. This suggests that all supplier incidents, regardless of their type, may be disrupting the outsourcing procedures and causing negative reputational spillover to the downstream, potentially damaging the performance of focal firms.[20]

Next the financial materiality of an ESG incident varies with the nature of the incident and supplier industry (Khan et al. 2016). For example, labor-related incidents likely have a greater financial impact on labor-intensive supplier industries. Following the Sustainability Accounting Standards Board (SASB) materiality standard, RepRisk matches its 28 issue topics to the SASB issue topics for each incident. We make use of the SASB issue topics provided by RepRisk and classify each supplier incident as material versus immaterial conditioning on whether the incident covers material SASB topics for the supplier's industry. We construct measures to separately

[20] We further break down supplier incidents into 28 topics as classified by RepRisk and examine their respective impacts on future financial performance and stock returns. As shown in Online Appendix Table A3, the adverse effects are more pronounced when the incidents are more likely to generate negative externalities on local communities (e.g., landscape impacts, impact on communities) and downstream firms (e.g., controversial products and services).

capture the frequency of material and immaterial supplier incidents. Row (ii) indicates that both material and immaterial ESG incidents predict accounting performance but only material incidents predict stock returns.

For robustness, we also follow Park et al. (2025) and distinguish issue topics that are financial materiality to each supplier industry based on market reaction. We first compute the supplier's market reaction in a seven-day window ([-1, +5]) surrounding each incident. Next, for each supplier industry, we take the average market reaction across all incidents pertaining to each of the 28 RepRisk issue topics. An issue topic is categorized as material to a supplier industry if the average market reaction equals to or is below −0.5%. As illustrated in Row (iii), both material and immaterial incidents predict ROA. However, only material incidents predict stock returns. Taken together with the results in Row (ii), this supports the notion that material ESG incidents have a stronger value implication.

Further, supplier ESG incidents are unlikely to be equally severe. For example, tax optimization is generally less severe than fraud or forced labor. To mitigate the concern that our results are driven by low-severity incidents, we classify supplier ESG incidents into high (i.e., severity score equals two or three) versus low severity (i.e., severity score equals one) based on RepRisk codification. The findings in Row (iv) indicate a generally negative impact of incidents across both severity levels on future profitability and returns. Nonetheless, the economic magnitude of high-severity incidents is significantly greater than low-severity incidents.

Finally, RepRisk collects ESG incidents from various news sources. So we explore whether the reach of these sources is an important factor. While incidents covered by international media likely have greater reach than those covered by local media, whether this difference affects value implications remains an empirical question. On one hand, higher-reach incidents may also be more

severe and may hurt firm value more. On the other hand, broader coverage may lead to quicker incorporation of ESG information into stock prices, weakening the relationship between supply chain ESG and future stock returns. To test this, we classify incidents into high-reach (i.e., covered by international or national news outlets, as indicated by a reach score equaling two or three) and low-reach (i.e., covered by local news outlets, as indicated by a reach score equaling one). Row (v) shows that both high- and low-reach incidents have a significant adverse impact on future ROA. Interestingly, the association between high-reach incidents and future stock return is insignificant (t = -1.533). This could be because the coverage by international or national news outlets (e.g., BBC) draws significant market attention, leading to quicker incorporation of the signal into stock prices.

4.3.2. By industry results

Next we explore the heterogeneity in the value-creation effects of supply chain ESG across industry sectors. To the extent that the reliance on outsourcing, the nature of inputs (e.g., labor- versus capital-intensive productions) and supply chain structures vary across industries, the exposure to supplier irresponsibility and thereby the importance of supply chain ESG would vary across sectors (Cousins et al. 2020; Wu 2024). To this end, we examine the association between supply chain ESG incidents and future performance separately for each of the Fama-French 10 industries. The results are shown in Table 8 Panel B. Again, for the sake of brevity, we only tabulate the coefficient of *Log SuppESG Incident* and its associated t-statistics. Results suggest that the impact of supply chain ESG incidents on firms' financial performance and future returns mainly concentrates in business equipment and manufacturing industries, where labor, business ethics, and pollution issues highly affect operations and could pose a concern for investors.

4.3.3. Robustness test using alternative measures of supply chain ESG

So far, our primary measure of supplier ESG has been based on the equally weighted average of supplier ESG incidents. This frequency-based measure assumes that all incidents are similar but does not consider severity and reach. To ensure the robustness of our results, we consider several alternative measures. First, we use the average RepRisk Index (RRI) across all suppliers, which incorporates both severity and reach. The results are consistent with our main results. (See Row (i) of Table 8 Panel C.) In addition, we measure supply chain ESG as the weighted average of supplier incidents to account for incident severity by setting the weight to the severity level of an incident (i.e., 1, 2, or 3). We again find that robust supply chain ESG creates value and the market does not immediately incorporate this information. (See Row (ii).)

Note that our main measure does not differentiate between the prevalence (i.e., that incidents are more broadly distributed among many suppliers) and persistence (i.e., that a few suppliers persistently experience many incidents) of supplier ESG incidents. Our results could be driven by a few problematic suppliers. So we distinguish the prevalence of supplier ESG incidents by creating three alternative metrics: (1) the fraction of new suppliers with ESG incidents; (2) the average frequency of supplier ESG incidents, for which we winsorize the incident frequency at the supplier level before taking the average value to alleviate the impact of outlier suppliers with high incident frequency; and (3) the average frequency excluding suppliers with recurring incidents in the preceding three years. The results are presented in Rows (iii) to (v). The findings confirm that supply chain ESG is significantly associated with future accounting performance and stock returns, indicating that our results are not driven by a few suppliers with persistent ESG issues.

Finally, we conduct an additional test to alleviate the potential concern that our main measure (i.e., the frequency of supply chain incidents relative to the size of the supply chain) could

overstate the effect of small and undiversified supplier networks. We thus restrict our sample to the firms that have a minimum of five suppliers. The results are presented in Row (vi). The findings resemble our main findings, both qualitatively and quantitatively, suggesting that our results are not driven by firms with limited supply chain network.

5. Conclusion

We examine the long-term value implications of supply chain ESG and whether the market understands this in a timely manner. To study this, we create a measure to capture supply chain ESG. Our evidence suggests that strong supply chain ESG creates shareholder value. Specifically, we find that robust supply chain ESG enables firms to achieve higher future profitability by enhancing revenue generation and firms' ability to procure inputs to fulfill purchase orders. This main effect on accounting performance is more pronounced when customers are more socially conscious and when the incidents disrupt supply chains more.

In addition, consistent with delayed market reaction to supply chain ESG signal, a low-minus-high portfolio strategy that takes a long (short) position in the quartile portfolio of the lowest (highest) frequency of supply chain ESG incidents generates a statistically significant alpha of 4.68% per year. This result is robust even when we control for other known risk factors and when we control for additional covariates in a Fama-MacBeth regression. Further analyses suggest that the delayed market response stems from a lack of supply chain transparency and the presence of high information acquisition costs.

Supply chain is now being perceived as an important ESG issue that has a large impact on society (Kothari et al. 2023). An increasing number of countries are considering requiring firms to enhance and disclose their due diligence to monitor suppliers' ESG practices. To this end, our

paper has policy implications, suggesting that such initiatives would provide valuable information to stakeholders and allow the market to promptly integrate supply chain ESG into stock prices.

Reference

Acemoglu, D., V. M. Carvalho, A. Ozdaglar, and A. Tahbaz-Salehi. 2012. The network origins of aggregate fluctuations. *Econometrica* 80(5): 1977–2016.

Bae, J. W., R. Elkamhi, and M. Simutin. 2019. The best of both worlds: Accessing emerging economies via developed markets. *The Journal of Finance* 74(5): 2579–2617.

Bae, K. H., R. M. Stulz, and H. Tan. 2008. Do local analysts know more? A cross-country study of the performance of local analysts and foreign analysts. *Journal of Financial Economics* 88(3): 581–606.

Barrot, J. N., and J. Sauvagnat. 2016. Input specificity and the propagation of idiosyncratic shocks in production networks. *The Quarterly Journal of Economics* 131(3): 1543–1592.

Bisetti, E., G. She, and A. Žaldokas. 2024. ESG Shocks in Global Supply Chains. Working paper. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4562841. Accessed May 16, 2025.

Bloomberg. 2023. Closing the scope 3 GHG emissions data gap. https://www.bloomberg.com/professional/blog/closing-the-scope-3-ghg-emissions-data-gap-2/ . Accessed April 16, 2024.

Bolton, P., and M. Kacperczyk. 2021. Do investors care about carbon risk? *Journal of Financial Economics* 142(2): 517–549.

Bolton, P., and M. Kacperczyk. 2023. Global pricing of carbon-transition risk. *Journal of Finance* 78(6): 3677–3754.

Bray, R. L., J. C. Serpa, and A. Colak. 2019. Supply chain proximity and product quality. *Management Science* 65(9): 4079–4099.

Brochet, F., P. Naranjo, and G. Yu. 2016. The capital market consequences of language barriers in the conference calls of non-US firms. *The Accounting Review* 91(4): 1023–1049.

Campbell, J. Y., and R. J. Shiller. 1988. Stock prices, earnings, and expected dividends. *The Journal of Finance* 43(3): 661–676.

Carhart, M. M. 1997. On persistence in mutual fund performance. *The Journal of Finance* 52(1): 57–82.

Carvalho, V. M., M. Nirei, Y. U. Saito, and A. Tahbaz-Salehi. 2021. Supply chain disruptions: Evidence from the great east Japan earthquake. *The Quarterly Journal of Economics* 136(2): 1255–1321.

Chang, H., J. Chen, S. W. Hsu, and R. Mashruwala. 2018. The impact of the bullwhip effect on sales and earnings prediction using order backlog. *Contemporary Accounting Research* 35(2): 1140–1165.

Chen, J., X. Su, X. Tian, B. Xu, and L. Zuo. 2025. Do Major Corporate Customers Deter Supplier Misconduct? *Journal of Accounting and Economics*, forthcoming.

Chen, J. Z., Z. Li, T. Mao, and A. Yoon. 2025. Global vs. Local ESG Ratings: Evidence from China. *The Accounting Review*, forthcoming.

Chen, L., and H. L. Lee. 2017. Sourcing under supplier responsibility risk: The effects of certification, audit, and contingency payment. *Management Science* 63: 2795–2812.

Christensen, H. B., E. T. De George, A. Joffre, D. and Macciocchi. 2023. Consumer responses to corporate social irresponsibility. Working paper. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4496599. Accessed April 16, 2024.

Cohen, L., and A. Frazzini. 2008. Economic links and predictable returns. *The Journal of Finance* 63(4): 1977–2011.

Cohen, R.B., C. Polk, and T. Vuolteenaho. 2003. The value spread. *The Journal of Finance* 58(2): 609–641.

Cousins, P., M. Dutordoir, B. Lawson, and J. Q. F. Neto. 2020. Shareholder wealth effects of modern slavery regulation. *Management Science* 66(11): 5265–5289.

Dai, R., H. Liang, and L. Ng. 2021. Socially responsible corporate customers. *Journal of Financial Economics* 142(2): 598–626.

Dai, R., R. Duan, H. Liang, and L. Ng. 2024. Outsourcing climate change. Working paper. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3765485. Accessed May 16, 2025.

Darendeli, A., P. Fiechter, J. M. Hitz, and N. Lehmann. 2022. The role of corporate social responsibility (CSR) information in supply chain contracting: Evidence from the expansion of CSR rating coverage. *Journal of Accounting and Economics* 74(2-3): 101525.

Eichholtz, P., N. Kok, and J. M. Quigley. 2010. Doing well by doing good? Green office buildings. *American Economic Review* 100(5): 2492–2509.

Ellis, J. A., C. E. Fee, and S. E. Thomas. 2012. Proprietary costs and the disclosure of information about customers. *Journal of Accounting Research* 50(3): 685–727.

Fama, E. F., and K. R. French. 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics* 33(1): 3–56.

Fama, E. F., and K. R. French. 2008. Dissecting anomalies. *The Journal of Finance* 63(4): 1653–1678.

Fama, E. F., and K. R. French. 2015. A five-factor asset pricing model. *Journal of Financial Economics* 116(1): 1–22.

Fama, E. F., and J. D. MacBeth. 1973. Risk, return, and equilibrium: Empirical tests. *Journal of Political Economy* 81(3): 607–636.

Files, R., and U. G. Gurun. 2018. Lenders' response to peer and customer restatements. *Contemporary Accounting Research* 35(1): 464–493.

The Financial Times. 2021. Danone: a case study in the pitfalls of purpose. https://www.ft.com/content/668d9544-28db-4ad7-9870-1f6671623ac5. Accessed April 16, 2024.

Gao, F., and G. C. Souza. 2022. Carbon offsetting with eco-conscious consumers. *Management Science* 68(11): 7879–7897.

George, T. J., C. Y. Hwang, and Y. Li. 2018. The 52-week high, q-theory, and the cross section of stock returns. *Journal of Financial Economics* 128(1): 148–163.

Gofman, M., G. Segal, and Y. Wu. 2020. Production networks and stock returns: The role of vertical creative destruction. *Review of Financial Studies* 33(12): 5856–5905.

Green, J., J. R. M. Hand, and X. F. Zhang. 2013. The supraview of return predictive signals. *Review of Accounting Studies* 18: 692–730.

Green, J., J. R. Hand, and X. F. Zhang. 2017. The characteristics that provide independent information about average US monthly stock returns. *Review of Financial Studies* 30(12): 4389–4436.

Guo, R., H. L. Lee, and R. Swinney. 2016. Responsible sourcing in supply chains. *Management Science* 62(9): 2722–2744.

Hainmueller, J., M. J. Hiscox, and S. Sequeira. 2015. Consumer demand for fair trade: Evidence from a multistore field experiment. *Review of Economics and Statistics* 97(2): 242–256.

Harvey, C. R., and Y. Liu. 2018. Detecting repeatable performance. *Review of Financial Studies* 31(7): 2499–2552.

Hertzel, M. G., Z. Li, M. S. Officer, and K. J. Rodgers. 2008. Inter-firm linkages and the wealth effects of financial distress along the supply chain. *Journal of Financial Economics* 87(2): 374–387.

Hendricks, K. B., B. W. Jacobs, and V. R. Singhal. 2020. Stock market reaction to supply chain disruptions from the 2011 Great East Japan Earthquake. *Manufacturing and Service Operations Management* 22(4): 683–699.

Hendricks, K. B., and V. R. Singhal. 2003. The effect of supply chain glitches on shareholder wealth. *Journal of Operations Management* 21(5): 501–522.

Hendricks, K. B., and V. R. Singhal. 2005. An empirical analysis of the effect of supply chain disruptions on long-run stock price performance and equity risk of the firm. *Production and Operations Management* 14(1): 35–52.

Ho, W., T. Zheng, H. Yildiz, and S. Talluri. 2015. Supply chain risk management: a literature review. *International Journal of Production Research* 53(16): 5031–5069.

Hoepner, A. G. F., I. Oikonomou, Z. Sautner, L.T. Starks, and X. Y. Zhou. 2024. ESG Shareholder Engagement and Downside Risk. *Review of Finance* 28(2): 483–510.

Hou, K., C. Xue, and L. Zhang. 2015. Digesting anomalies: An investment approach. *Review of Financial Studies* 28(3): 650–705.

Hou, K., C. Xue, and L. Zhang. 2020. Replicating anomalies. *Review of Financial Studies* 33(5): 2019–2133.
Houston, J. F., C. Lin, H. Shan, and M. Shen. 2024. How does ESG shape consumption? Working paper. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4243071. Accessed May 16, 2025.
Hsu, P. H., K. Li, and C. Y. Tsou. 2023. The pollution premium. *The Journal of Finance* 78(3): 1343–1392.
Huang, Y., C. Lin, S. Liu, and H. Tang. 2023. Trade networks and firm value: Evidence from the US-China trade war. *Journal of International Economics* 145: 103811.
Jacobs, B. W., and V. R. Singhal. 2020. Shareholder value effects of the Volkswagen emissions scandal on the automotive ecosystem. *Production and Operations Management* 29(10): 2230–2251.
Jain, N., and D. A. Wu. 2023. Can global sourcing strategy predict stock returns? *Manufacturing and Service Operations Management* 25(4): 1357–1375.
Jensen, T. I., B. Kelly, and L. H. Pedersen. 2023. Is there a replication crisis in finance? *The Journal of Finance* 78(5): 2465–2518.
Khan, M., G. Serafeim, and A. Yoon. 2016. Corporate sustainability: First evidence on materiality. *The Accounting Review* 91(6): 1697–1724.
Kim, S., S. M. Wagner, and C. Colicchia. 2019. The impact of supplier sustainability risk on shareholder value. *Journal of Supply Chain Management* 55(1): 71–87.
Kothari, S. P., L. Zhang, and L. Zuo. 2023. Disclosure regulation: Past, present, and future. In *Handbook of Financial Decision Making* (eds. G. Hilary and D. McLean): 215–234. Cheltenham: Edward Elgar Publishing.
Koijen, R. S., R. J. Richmond, and M. Yogo. 2024. Which investors matter for equity valuations and expected returns? *Review of Economic Studies* 91(4): 2387–2424.
Lee, H., K. O'Marah, G. John, and B. Blake. 2012. The chief supply chain officer report 2012. *SCM World*. https://studylib.net/doc/8404104/the-chief-supply-chain-officer-report-2012. Accessed April 16, 2024.
Lefevre C., D. Pelle, S. Abedi, R. Martinez, P. Thaler. 2010. *Value of sustainable procurement practices*. Technical report. https://resources.ecovadis.com/i/1100686-value-of-sustainable-procurement-practices/0?. Accessed April 16, 2024.
Li, C., N. Li, and F. Zhang. 2023. Using economic links between firms to detect accounting fraud. *The Accounting Review* 98(1): 399–421.
Liu, J., S. Sarkar, S. Kumar, and Z. Jin. 2018. An analysis of stock market impact from supply chain disruptions in Japan. *International Journal of Productivity and Performance Management* 67(1): 192–206.
Lu, H., Q. Peng, J. E. Shin, and L. Yu. 2023. Migration of global supply chains: A real effect of mandatory ESG disclosure. Working paper. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4581611. Accessed April 16, 2024.
Luo, S., and N. J. Nagarajan. 2015. Information complementarities and supply chain analysts. *The Accounting Review* 90(5): 1995–2029.
Mao, M. Q., and K. J. Wei. 2016. Cash-flow news and the investment effect in the cross section of stock returns. *Management Science* 62(9): 2504–2519.
Matsumura, E. M., R. Prakash, and S. C. Vera-Muñoz. 2014. Firm-value effects of carbon emissions and carbon disclosures. *The Accounting Review* 89(2): 695–724.
Matsumura, E. M., R. Prakash, and S. C. Vera-Muñoz. 2024. Climate-risk materiality and firm risk. *Review of Accounting Studies* 29(1): 33–74.
Newey, W. K., and K. D. West. 1987. Hypothesis testing with efficient method of moments estimation. *International Economic Review*: 777–787.
Pandit, S., C. E. Wasley, and T. Zach. 2011. Information externalities along the supply chain: The economic determinants of suppliers' stock price reaction to their customers' earnings announcements. *Contemporary Accounting Research* 28(4): 1304–1343.
Pankratz, N., and C. Schiller. 2024. Climate change and adaptation in global supply-chain networks. *Review of Financial Studies* 37(6): 1729–1777.

Park, M., A. Yoon, and T. Zach. 2025. Sell-side analysts' assessment of ESG risk. *Journal of Accounting and Economics* 79(2-3): 101759.
Porter, M. E. 2008. The five competitive forces that shape strategy. *Harvard Business Review* 86(1): 78.
Pournader, M., A. Kach, and S. Talluri. 2020. A review of the existing and emerging topics in the supply chain risk management literature. *Decision Sciences* 51(4): 867–919.
Rajgopal, S., T. Shevlin, and M. Venkatachalam. 2003. Does the stock market fully appreciate the implications of leading indicators for future earnings? Evidence from order backlog. *Review of Accounting Studies* 8: 461–492.
Richardson, S. A., R. G. Sloan, M. T. Soliman, and I. Tuna. 2005. Accrual reliability, earnings persistence and stock prices. *Journal of Accounting and Economics* 39(3): 437–485.
Richardson, S., R. Sloan, and H. You. 2012. What makes stock prices move? Fundamentals vs. investor recognition. *Financial Analysts Journal* 68(2): 30-50.
Sautner, Z., and L. T. Starks. 2023. ESG and downside risks: Implications for pension funds. In *Pension Funds and Sustainable Investment: Challenges and Opportunities* (eds. P. B. Hammond, R. Maurer, and O. Mitchell): 137–156. Oxford: Oxford University Press.
Sautner, Z., L. Van Lent, G. Vilkov, and R. Zhang. 2023a. Firm-level climate change exposure. *The Journal of Finance* 78(3): 1449–1498.
Sautner, Z., L. Van Lent, G. Vilkov, and R. Zhang. 2023b. Pricing climate change exposure. *Management Science* 69(12): 7540–7561.
Schiller, C. 2018. Global supply chain networks and corporate social responsibility. Working paper. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3089311. Accessed December 3, 2022.
Sloan, R. G. 1996. Do stock prices fully reflect information in accruals and cash flows about future earnings? *The Accounting review* 71(3): 289–315.
She, G. 2022. The real effects of mandatory nonfinancial disclosure: evidence from supply chain transparency. *The Accounting Review* 97(5): 399–425.
Shi, Y., J. Wu, Y. Zhang, and Y. Zhou. 2023. Green image management in supply chains: Strategic disclosure of corporate suppliers. Working paper. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3700310. Accessed May 16, 2025.
Vuolteenaho, T. 2002. What drives firm-level stock returns? *The Journal of Finance* 57(1): 233–264.
Welch, K., and A. Yoon. 2023. Do high-ability managers choose ESG projects that create shareholder value? Evidence from employee opinions. *Review of Accounting Studies* 28(4): 2448–2475.
Wu, D. 2024. Text-based measure of supply chain risk exposure. *Management Science* 70(7): 4781–4801.
Wu, J., and J. R. Birge. 2015. Supply chain network structure and firm returns. Working paper. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2385217. Accessed April 4, 2023.

Table 1 Sample selection and distribution

This table describes the sample. Panel A presents the sample selection process. Panel B presents the distribution of supplier incidents by event type. Panel C presents the percentage of firm-year observations across Fama-French 10 Industries.

Panel A: Sample selection

	Firm-year Obs.	Monthly return Obs.
Merged sample between FactSet, RepRisk, Compustat, and CRSP from 2011 to 2021 (corresponding monthly return is from July 2012 to June 2023)	15,222	178,270
(-) Observations without Fama-French 10 classification	(33)	(374)
(-) Observations with sales smaller than $1 million or missing market price	(501)	(5,919)
(-) Observations with missing control and dependent variables	(1,026)	(7,917)
Final sample	13,622	164,060

Table 1, continued

Panel B: Incident frequency by RepRisk's 28 topics

Topic	Percentage
Emissions	3.89%
Local pollution	4.98%
Landscape impacts	7.29%
Overuse and wasting of resources	0.58%
Waste issues	2.36%
Animal mistreatment	0.41%
Human rights abuses	9.14%
Impact on communities	7.82%
Local participation issues	1.29%
Social discrimination	0.87%
Forced labor	1.93%
Child labor	0.96%
Freedom of association and collective bargaining	1.87%
Discrimination in employment	1.27%
Occupational health and safety issues	3.90%
Poor employment conditions	5.37%
Corruption, bribery, extortion, money laundering	4.09%
Executive compensation issues	0.63%
Misleading communication	2.45%
Fraud	3.56%
Tax evasion	1.37%
Tax optimization	2.20%
Anti-competitive practices	3.00%
Controversial products and services	2.44%
Products (health and environmental issues)	4.01%
Supply chain issues	6.89%
Violation of national legislation	12.95%
Violation of international legislation	2.47%

Panel C: Sample distribution by Fama-French 10 industries

Fama-French 10 industries	% of Firm-year
Consumer nondurables	6.82%
Consumer durables	3.23%
Manufacturing	16.18%
Oil, gas, and coal extraction and products	4.21%
Business equipment	24.53%
Telephone and television transmission	2.94%
Wholesale, retail, and some services (laundries, repair shops)	14.74%
Healthcare, medical equipment, and drugs	14.63%
Other	12.71%

Table 2 Descriptive statistics

This table reports the descriptive statistics. Panel A reports the summary statistics of key variables. ROA_{t+1} is the operating income before depreciation divided by average total assets in year t+1. ATO_{t+1} is the total sales divided by average total assets in year t+1. $Inventory_{t+1}$ is the inventory divided by average total assets in year t+1. $Sales\ Growth_{t+1}$ is the change in the natural logarithm of total sales from year t to year t+1. *ΔPO* is the change in the purchase order backlog from year t-1 to year t scaled by total sales. *SuppESG Incident* is the number of supplier incidents divided by the number of suppliers in year t. *Size* is the logarithm of market capitalization deflated by CPI (measured in 2009 dollars (millions USD)). *BM* is the book value of equity divided by the market value of equity in year t. *Return* is the natural logarithm of one plus annual stock return in year t. *PRC* is the natural logarithm of average stock price in year t. *Vol* is the natural logarithm of average stock trading volume in year t. *CAPX* is the capital expenditure divided by net property, plant, and equipment in year t. *Firm Incidents* is the number of firm RepRisk incidents in year t. *ROA* is the operating income before depreciation divided by average total assets in year t. Panel B reports the average number of supply chain ESG incidents per supplier across the Fama-French 10 industries. Detailed variable definitions are in Appendix A.

Panel A: Summary statistics

	Obs.	Mean	SD	P25	P50	P75
ROA_{t+1}	13,622	0.092	0.149	0.062	0.113	0.164
ATO_{t+1}	13,622	1.024	0.713	0.537	0.837	1.321
$Inventory_{t+1}$	13,462	0.117	0.134	0.008	0.079	0.174
$Sales\ Growth_{t+1}$	13,564	0.060	0.236	-0.019	0.055	0.146
ΔPO	13,564	0.013	0.089	0.000	0.000	0.000
SuppESG Incident	13,622	1.576	3.146	0.000	0.500	1.750
Size	13,622	7.266	1.995	5.930	7.318	8.582
BM	13,622	0.516	0.440	0.221	0.398	0.674
Return	13,622	0.042	0.429	-0.181	0.073	0.291
PRC	13,622	3.299	1.223	2.544	3.449	4.152
Vol	13,622	11.454	1.655	10.472	11.531	12.585
CAPX	13,622	0.231	0.161	0.119	0.190	0.297
Firm Incident	13,622	0.947	2.599	0.000	0.000	1.000
ROA	13,622	0.094	0.147	0.065	0.116	0.166

Table 2, continued

Panel B: Supply chain ESG incidents by Fama-French 10 industries

Industry	*Avg. # of SuppESG Incident*
Consumer nondurables	1.362
Consumer durables	1.279
Manufacturing	1.429
Oil, gas, and coal extraction and products	0.751
Business equipment	1.902
Telephone and television transmission	2.292
Wholesale, retail, and some services (laundries, repair shops)	1.888
Healthcare, medical equipment, and drugs	1.037
Other	1.689

Table 3 Supply chain ESG and future accounting performance

This table reports the regression results of the relation between supply chain ESG and future financial performance. The dependent variable is ROA_{t+1}, which is the operating income before depreciation divided by average total assets in year t+1. *Log SuppESG Incident* is the natural logarithm of one plus *SuppESG Incident*, which is the number of supplier incidents divided by the number of suppliers in year t. *ROA* is the operating income before depreciation divided by average total assets in year t. *Size* is the logarithm of market capitalization deflated by CPI (measured in 2009 dollars (millions USD)). *BM* is the book value of equity divided by the market value of equity in year t. *Return* is the natural logarithm of one plus annual stock return in year t. *PRC* is the natural logarithm of average stock price in year t. *Vol* is the natural logarithm of average stock trading volume in year t. *CAPX* is the capital expenditure divided by net property, plant, and equipment in year t. *Log Firm Incident* is the natural logarithm of one plus *Firm Incidents*. All variables are winsorized at the 1st and 99th percentiles and the detailed definitions are in Appendix A. Standard errors are robust to heteroskedasticity and clustered at the firm level, and t-statistics are reported in parentheses. ∗, ∗∗, and ∗∗∗ denote significance at the 10%, 5%, and 1% (two-sided) levels, respectively.

Dep. var. =	ROA_{t+1}	
	(1)	(2)
Log SuppESG Incident	-0.003***	-0.002**
	(-3.185)	(-2.434)
ROA	0.847***	0.795***
	(83.817)	(64.701)
Size		0.008***
		(6.010)
BM		-0.003
		(-1.619)
Return		0.053***
		(17.675)
PRC		-0.002
		(-1.269)
Vol		-0.005***
		(-5.285)
CAPX		-0.032***
		(-5.211)
Log Firm Incident		-0.003**
		(-2.483)
Industry FE	Yes	Yes
Year FE	Yes	Yes
Obs.	13,622	13,622
Adj. R-squared	0.740	0.767

Table 4 Mechanism test

This table reports the mechanism test results on the relation between supply chain ESG and future financial performance in year t+1. Panel A reports the heterogeneity tests. ROA_{t+1} is the operating income before depreciation divided by average total assets in year t+1. *Log SuppESG Incident* is the natural logarithm of one plus *SuppESG Incident*, which is the number of supplier incidents divided by the number of suppliers in year t. Columns (1) and (2) report the results based on customer ESG performance. We partition our sample into two subgroups based on median *Customer ESG*, which is the average ESG performance of the focal firm's customers, as measured by RepRisk Rating. Columns (3) and (4) report the results based on the supply chain turnover ratio. We partition our sample into two subgroups based on median *Supplier Vulnerability*, which is the fraction of suppliers in year t that are excluded from the focal firm's supply chain network from year t to year t+2. Panel B reports future sales generation and input management tests. ATO_{t+1} is the total sales divided by average total assets in year t+1. $Inventory_{t+1}$ is the inventory divided by average total assets in year t+1. $Sales\ Growth_{t+1}$ is the change in the natural logarithm of total sales from year t to year t+1. *ΔPO* is the change in the purchase order backlog from year t-1 to year t scaled by total sales. All columns control for *Size*, *BM*, *Return*, *PRC*, *Vol*, *CAPX*, *Log Firm Incident*, and *ROA* as well as lagged one-year of the dependent variable. All variables are winsorized at the 1st and 99th percentiles, and the detailed definitions are in Appendix A. Standard errors are robust to heteroskedasticity and clustered at the firm level, and t-statistics are reported in parentheses. ∗, ∗∗, and ∗∗∗ denote significance at the 10%, 5%, and 1% (two-sided) levels, respectively.

Panel A: Heterogeneity tests

Dep. var. =	ROA_{t+1}			
Part. var.=	*Customer ESG*		*Supplier Vulnerability*	
	Low	High	Low	High
	(1)	(2)	(3)	(4)
Log SuppESG Incident	-0.000	-0.006***	-0.001	-0.005***
	(-0.169)	(-4.141)	(-0.843)	(-2.932)
Wald Test: Coefficients Diff.	8.023***		3.105*	
Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Obs.	4,715	4,686	5,659	5,354
Adj. R-squared	0.746	0.757	0.752	0.767

Table 4, continued

Panel B: Future sales generation and input management

Dep. var.=	ATO_{t+1}	$Inventory_{t+1}$	$Sales\ Growth_{t+1}$
	(1)	(2)	(3)
Log SuppESG Incident	-0.009***	-0.001***	-0.000
	(-3.861)	(-2.699)	(-0.148)
ΔPO			0.231***
			(9.411)
ΔPO×Log SuppESG Incident			-0.044*
			(-1.896)
Controls	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Obs.	13,622	13,462	13,564
Adj. R-squared	0.943	0.948	0.181

Table 5 Calendar time portfolio regression

This table reports portfolio characteristics and calendar-time regression results. Panel A presents the time-series average of firm characteristics for four portfolios sorted based on the intensity of supply chain ESG incidents. Firms with the best (worst) supply chain ESG are indicated as the low (high) group. *Log SuppESG Incident* is the natural logarithm of one plus *SuppESG Incident*, which is the number of supplier incidents divided by the number of suppliers in year t. *Size* is the logarithm of market capitalization deflated by CPI (measured in 2009 dollars (millions USD)). *BM* is the book value of equity divided by the market value of equity in year t. *Return* is the natural logarithm of one plus the stock return during the last 12 months. *PRC* is the natural logarithm of stock price at the end of month t-2. *Vol* is the natural logarithm of stock trading volume in month t-2. *CAPX* is the capital expenditure divided by net property, plant, and equipment in year t. *Log Firm Incident* is the natural logarithm of one plus *Firm Incident*, which is the number of firm RepRisk incidents in year t. *ROA* is the operating income before depreciation divided by average total assets in year t. Panel B reports alphas and t-statistics from calendar time monthly portfolio regressions. The regressions are estimated from July 2012 to June 2023. We regress monthly portfolio return against the market excess returns (*MKT*), Fama and French (1993) size and book-to-market factors (*SMB* and *HML*) and Fama and French (2015) profitability and investment factors (*RMW* and *CMA*) to estimate alpha. Standard errors are estimated by Newey-West correction, and t-statistics are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% (two-sided) levels, respectively.

Panel A: Firm characteristics by portfolio

	Low	2	3	High
SuppESG Incident	0.010	0.381	1.058	4.816
Size	6.644	8.258	7.874	6.829
BM	0.539	0.444	0.487	0.561
Return	0.049	0.063	0.065	0.029
PRC	3.122	3.713	3.491	3.070
Vol	3.948	5.266	5.009	4.330
CAPX	0.239	0.204	0.227	0.240
Firm Incident	0.272	1.891	1.693	0.562
ROA	0.089	0.126	0.098	0.069

Table 5, continued

Panel B: Alphas from calendar time portfolio regressions

	Stats.	Low	2	3	High	Low-High
Value-weighted	*Alpha*	0.166**	0.043	-0.015	-0.224*	0.390***
	t-stat	(2.110)	(0.619)	(-0.209)	(-1.760)	(2.809)
	Adj. R-squared	0.939	0.946	0.952	0.928	0.115
	Avg. # of firms	461	223	330	325	
Equal-weighted excl. microcaps	*Alpha*	0.184**	0.004	0.063	-0.036	0.220**
	t-stat	(2.549)	(0.047)	(0.672)	(-0.491)	(2.599)
	Adj. R-squared	0.971	0.956	0.963	0.967	0.155
	Avg. # of firms	280	179	225	221	

Table 6 Fama-MacBeth and panel regressions

This table reports the results from Fama-MacBeth and OLS regressions. The dependent variable is the monthly stock return for each firm measured as in the calendar-time portfolios for every month beginning from July of year t+1 to June of year t + 2. *Log SuppESG Incident* is the natural logarithm of one plus *SuppESG Incident*, which is the number of supplier incidents divided by the number of suppliers in year t. *ROA* is the operating income before depreciation divided by average total assets in year t. *Size* is the logarithm of market capitalization deflated by CPI (measured in 2009 dollars (millions USD)). *BM* is the book value of equity divided by the market value of equity in year t. *Return* is the natural logarithm of one plus the stock return during the last 12 months. *PRC* is the natural logarithm of the stock price at the end of month t-2. *Vol* is the natural logarithm of the stock trading volume in month t-2. *CAPX* is the capital expenditure divided by net property, plant, and equipment in year t. *Log Firm Incident* is the natural logarithm of one plus *Firm Incidents*. All regressors are winsorized at the 1st and 99th percentiles and the detailed definitions are in Appendix A. Standard errors are robust to heteroskedasticity and estimated by Newey-West correction, and t-statistics are reported in parentheses. ∗, ∗∗, and ∗∗∗ denote significance at the 10%, 5%, and 1% (two-sided) levels, respectively.

Model=	FMB		OLS	
Weight=	Value-weighted	Equal-weighted	Value-weighted	Equal-weighted
Sample =	Full	Excl. microcaps	Full	Excl. microcaps
	(1)	(2)	(3)	(4)
Log SuppESG Incident	-0.189**	-0.100**	-0.249***	-0.117**
	(-1.985)	(-2.008)	(-3.071)	(-2.304)
ROA	-0.080	0.277	0.257	0.190
	(-0.099)	(0.345)	(0.455)	(0.436)
Size	-0.219	-0.006	-0.198*	-0.061
	(-1.093)	(-0.033)	(-1.915)	(-0.946)
BM	-0.496	-0.208	-0.039	0.004
	(-1.211)	(-0.586)	(-0.200)	(0.028)
Return	0.019	-0.010	-0.358	-0.360**
	(0.043)	(-0.025)	(-1.481)	(-2.504)
PRC	0.215	-0.039	0.115	-0.077
	(0.995)	(-0.255)	(0.846)	(-0.992)
Vol	0.280	0.078	0.264**	0.117**
	(1.529)	(0.497)	(2.484)	(2.045)
CAPX	0.202	-0.076	0.312	0.130
	(0.338)	(-0.162)	(0.739)	(0.475)
Log Firm Incident	-0.097	-0.175**	-0.068	-0.104**
	(-1.409)	(-2.016)	(-0.967)	(-2.007)
Industry FE	-	-	Yes	Yes
Year-month FE	-	-	Yes	Yes
Obs.	164,060	112,216	164,060	112,216
Adj. R-squared	0.137	0.079	0.266	0.224

Table 7 Information frictions and delayed market reactions

This table reports cross-sectional test results on supply chain opacity and complexity. The results are from Fama-MacBeth regressions. Panel A reports the results on supply chain opacity. We partition our sample into two subgroups based on supply chain opacity (low and high). Supply chain opacity is measured as the fraction of suppliers that are disclosed only by the suppliers. Panel B reports the results on supply chain complexity. We partition our sample into two subgroups based on supply chain complexity (low and high). Supply chain complexity is measured as the fraction of suppliers that are located outside of the United States. The dependent variable is the monthly stock return for each firm measured as in the calendar-time portfolios for every month beginning from July of year t+1 to June of year t + 2. All columns control for *Size*, *BM*, *Return*, *PRC*, *Vol*, *CAPX*, *Log Firm Incident*, and *ROA*. All regressors are winsorized at the 1st and 99th percentiles, and the detailed definitions are in Appendix A. Panel C reports the alphas from calendar-time regressions of monthly returns on the Fama and French (2015) five factors for the portfolio of taking a long position for firms with the best supply chain ESG and a short position for the portfolio of firms with the worst supply chain ESG. Rows 1 to 3 report the alphas for months 1 to 12, 13 to 24, and 25 to 36 after portfolio formation, respectively. Standard errors are robust to heteroskedasticity and estimated by Newey-West correction, and t-statistics are reported in parentheses. ∗, ∗∗, and ∗∗∗ denote significance at the 10%, 5%, and 1% (two-sided) levels, respectively.

Panel A: Supply chain opacity

	Low	High
	(1)	(2)
Log SuppESG Incident	0.033	-0.340**
	(0.340)	(-2.479)
Wald Test: *Coefficients Diff.*	4.944**	
Controls	Yes	Yes
Obs.	81,891	82,169
Adj. R-squared	0.162	0.148

Panel B: Supply chain complexity

	Low	High
	(1)	(2)
Log SuppESG Incident	-0.011	-0.318**
	(-0.122)	(-2.562)
Wald Test: *Coefficients Diff.*	4.036**	
Controls	Yes	Yes
Obs.	82,901	81,159
Adj. R-squared	0.136	0.170

Table 7, continued

Panel C: Longevity analysis

	Long-short alpha Value-weighted	Long-short alpha Equal-weighted excl. microcaps
	(1)	(2)
1-12 months	0.390***	0.220**
	(2.809)	(2.599)
13-24 months	0.026	0.069
	(0.163)	(0.732)
25-36 months	0.058	-0.055
	(0.289)	(-0.310)

Table 8 Additional analyses

This table reports the relation between supply chain ESG and future financial performance (in Column (1)) or stock returns (in Column (2)). For brevity, we only report the coefficient of *Log SuppESG Incident* and the associated t-statistics. The dependent variables in Columns (1) and (2) are ROA_{t+1}, which is operating income before depreciation divided by average total assets in year t+1, and monthly stock return for each firm measured as in the calendar-time portfolios for every month beginning from July of year t+1 to June of year t + 2, respectively. Panel A explores the granularities of RepRisk incident data. Row (i) decomposes supplier incidents into environmental, social, governance, and cross-cutting related incidents. Rows (ii) and (iii) differentiate material versus immaterial incidents based on the SASB industry standards or supplier industry stock market returns to incident topics. Row (iv) divides incidents based on their severity codified by RepRisk, where incidents with a severity score equal to one are classified as *Less Severe* and those with severity scores equal to two or three are classified as *More Severe*. Row (v) differentiates incidents with high versus low reach, where incidents with a reach score equal to one are classified as *Low Reach* and those with a severity score equal to two or three are classified as *High Reach*. Panel B explores the effects across Fama-French 10 industries. Panel C assesses the sensitivities of the results to alternative measures of supply chain ESG performance. Row (i) uses the average country industry-adjusted RepRisk index across suppliers. Row (ii) uses the severity-weighted frequency of incidents across suppliers. Row (iii) excludes suppliers with recurring incidents from the calculation of *Log SuppESG Incident*. Row (iv) uses the fraction of new suppliers with ESG incidents. Row (v) winsorizes the number of incidents for each supplier before calculating customer firm-level *Log SuppESG Incident*. Row (vi) requires a firm to have at least five suppliers. All columns control for *Size*, *BM*, *Return*, *PRC*, *VOL*, *CAPX*, *Log Firm Incident*, and *ROA*. All variables are winsorized at the 1st and 99th percentiles in Column (1), and all regressors are winsorized at the 1st and 99th percentiles in Column (2). Detailed definitions are in Appendix A. Standard errors are clustered at the firm level in Column (1) and are estimated by Newey-West correction in Column (2). t-statistics are reported in parentheses. ∗, ∗∗, and ∗∗∗ denote significance at the 10%, 5%, and 1% (two-sided) levels, respectively.

Dep. var. =	ROA_{t+1}		*Return*	
	(1)		(2)	
	Coef.	t-stat.	*Coef.*	t-stat.
Panel A: Exploring the granularities of RepRisk data				
(i) By incident type				
Environmental	-0.003**	(-2.150)	-0.317**	(-2.007)
Social	-0.003**	(-2.536)	-0.196	(-1.586)
Governance	-0.003**	(-2.284)	-0.225	(-1.386)
Cross-cutting	-0.002**	(-2.137)	-0.222*	(-1.864)
(ii) By materiality_SASB				
Immaterial	-0.002*	(-1.784)	-0.174	(-1.575)
Material	-0.004***	(-2.587)	-0.316*	(-1.868)
(iii) By materiality_Return				
Immaterial	-0.002**	(-2.470)	-0.141	(-1.334)
Material	-0.003**	(-2.139)	-0.333*	(-1.972)
(iv) By severity				
Less severe	-0.003***	(-2.828)	-0.200*	(-1.701)
More severe	-0.002*	(-1.726)	-0.295**	(-1.983)
(v) By reach				
Low reach	-0.003**	(-2.119)	-0.287**	(-1.999)
High reach	-0.003**	(-2.574)	-0.188	(-1.533)

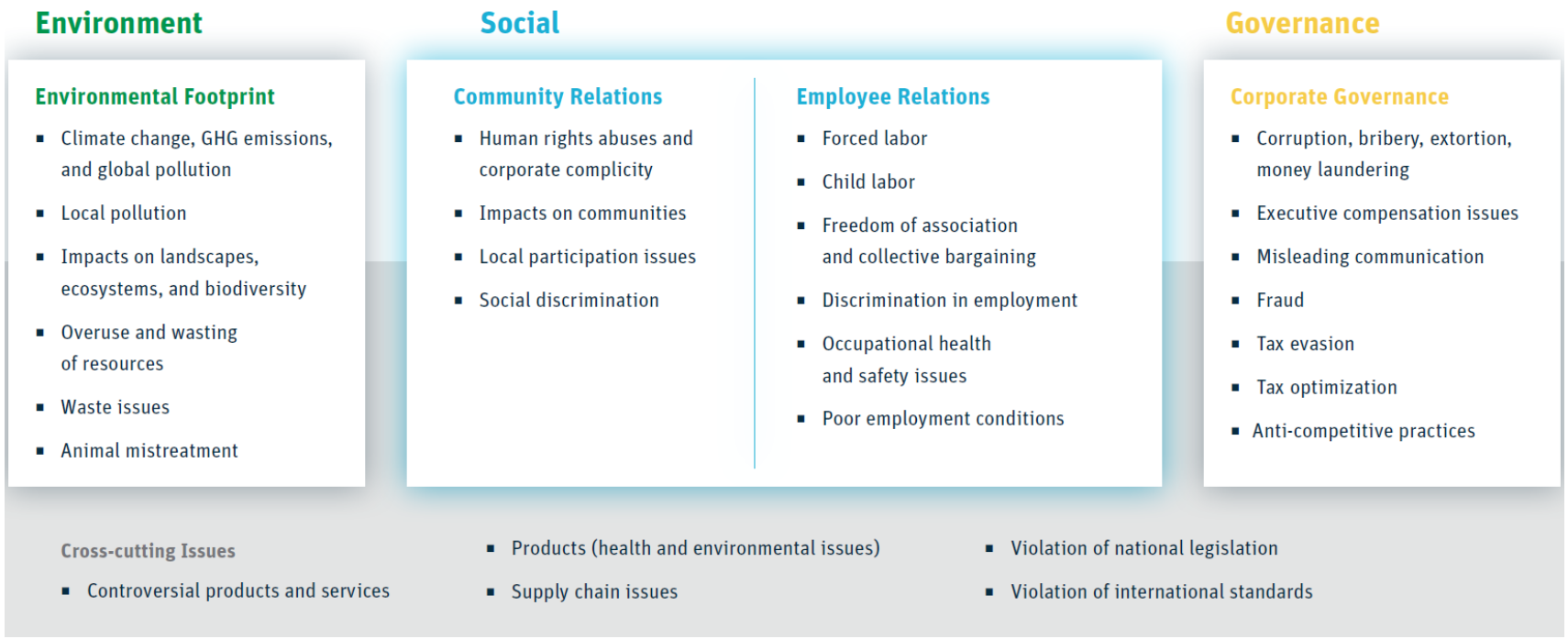
Table 8, continued

Dep. var. =	*ROA_{t+1}*		*Return*	
	(1)		(2)	
	Coef.	t-stat.	*Coef.*	t-stat.
Panel B: By industry				
Consumer nondurables	0.001	(0.300)	-0.070	(-0.367)
Consumer durables	-0.002	(-0.871)	-0.233	(-0.743)
Manufacturing	-0.003**	(-2.003)	-0.375**	(-2.467)
Oil, gas, and coal extraction and products	0.003	(0.235)	-0.524	(-1.318)
Business equipment	-0.003*	(-1.800)	-0.284**	(-2.053)
Telephone and television transmission	-0.004	(-1.331)	0.781	(1.464)
Wholesale, retail, and some services (laundries, repair shops)	-0.001	(-0.507)	0.143	(1.003)
Healthcare, medical equipment, and drugs	0.002	(0.450)	-0.479**	(-2.026)
Other	-0.003	(-1.522)	0.033	(0.238)
Panel C: Alternative supply chain ESG measures				
(i) Supplier RepRisk index	-0.001*	(-1.922)	-0.092*	(-1.799)
(ii) Severity-weighted incidents	-0.002**	(-2.317)	-0.174**	(-2.129)
(iii) Excluding suppliers with recurring incidents	-0.003*	(-1.942)	-0.427**	(-2.456)
(iv) Percentage of new suppliers with ESG incidents	-0.008*	(-1.799)	-0.842**	(-2.211)
(v) Winsorize supplier incidents at the supplier level (5%)	-0.002**	(-2.413)	-0.191**	(-2.008)
(vi) With at least five suppliers	-0.003***	(-2.805)	-0.288**	(-2.245)

Appendix A Variable definitions

Variable	Definition
SuppESG Incident	The number of suppliers ESG incidents divided by the number of suppliers in year t
ROA_{t+1}	Operating income before depreciation divided by average total assets in year t+1
ROA	Operating income before depreciation divided by average total assets in year t
ATO_{t+1}	Total sales divided by average total assets in year t+1
$Inventory_{t+1}$	Inventory divided by average total assets in year t+1
$Sales\ Growth_{t+1}$	Change in the natural logarithm of sales from year t to year t+1
ΔPO	Change in the purchase order backlog from year t-1 to year t scaled by total sales
Firm Incident	The number of firm RepRisk incidents in year t
Size	The logarithm of market capitalization deflated by CPI (measured in 2009 dollars (millions USD))
BM	The book value of equity divided by the market value of equity in year t
Return	The natural logarithm of one plus annual stock return in year t for the accounting performance test and the natural logarithm of one plus stock return during the last 12 months for the return test
PRC	The natural logarithm of average monthly stock price in year t for the accounting performance test and the natural logarithm of stock price at the end of month t-2 for the return test
Vol	The natural logarithm of average stock trading volume in year t for the accounting performance test and the natural logarithm of stock trading volume in month t-2 for the return test
CAPX	Capital expenditure divided by net property, plant, and equipment in year t
Customer ESG	The average ESG performance of the focal firm's customers in year t. ESG performance is the RepRisk Rating
Supplier Vulnerability	The fraction of suppliers that are excluded from the focal firm's supply chain network from year t to year t+2

Appendix B 28 RepRisk issue topics



Online Appendix

Online Appendix 1: Longer-term profitability and weighted least squares regression

In Table A1, we assess whether the effect of supply chain ESG incidents on future profitability remains robust when we weigh each firm by its economic significance. This is important, given that our return results in Tables 5 and 6 are driven by larger firms. We weigh each observation by market capitalization and confirm that supply chain ESG incidents exhibit a negative association with future profitability.

Online Appendix 2: Equal-weighted portfolio test including microcaps

We examine the equal-weighted portfolio test for the full sample, including microcap firms. Panel A of Table A2 provides the descriptive statistics. On average, a microcap firm has only 5.7 suppliers, compared to 19.4 suppliers for other firms. While microcaps account for 32% (= 4,294 / 13,622) of the observations, their market capitalization is only 0.8% (= 960 / 116,640) of our sample. The results where alpha becomes insignificant are presented in Panel B.

Online Appendix 3: Heterogeneity test by event topic

We break down supplier incidents into 28 topics as classified by RepRisk and then examine their respective impacts on future financial performance and stock returns. Table A3 shows that the adverse effects are more evident when the incidents are more likely to generate negative externalities on local communities (e.g., landscape impacts, impact on communities, human rights abuse) and downstream firms (e.g., controversial products and services).

Online Appendix Table A1 Robustness of the profitability test

This table reports the regression results of the relation between supply chain ESG and future financial performance. Panel A reports the OLS estimation using the full sample, weighing each observation by market capitalization. Panel B reports the OLS estimation after excluding microcaps from the sample. The dependent variable is ROA_{t+1}, which is the operating income before depreciation divided by average total assets in year t+1. *Log SuppESG Incident* is the natural logarithm of one plus *SuppESG Incident*, which is the number of supplier incidents divided by the number of suppliers in year t. *ROA* is the operating income before depreciation divided by average total assets in year t. *Size* is the logarithm of market capitalization deflated by CPI (measured in 2009 dollars (millions USD)). *BM* is the book value of equity divided by the market value of equity in year t. *Return* is the natural logarithm of one plus annual stock return in year t. *PRC* is the natural logarithm of average stock price in year t. *Vol* is the natural logarithm of average stock trading volume in year t. *CAPX* is the capital expenditure divided by net property, plant, and equipment in year t. *Log Firm Incident* is the natural logarithm of one plus *Firm Incidents*. All variables are winsorized at the 1st and 99th percentiles, and the detailed definitions are in Appendix A. Standard errors are robust to heteroskedasticity and clustered at the firm level, and t-statistics are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% (two-sided) levels, respectively.

Panel A: Value-weighted Regression

Dep. var.	ROA_{t+1}	
Model	Value-weighted	
	(3)	(4)
Log SuppESG Incident	-0.006***	-0.006***
	(-3.829)	(-3.901)
ROA	0.860***	0.849***
	(58.270)	(54.721)
Size		0.001
		(0.640)
BM		-0.020***
		(-4.028)
Return		0.065***
		(12.455)
PRC		-0.003
		(-1.284)
Vol		0.002
		(1.113)
CAPX		-0.029***
		(-2.908)
Log Firm Incident		-0.003**
		(-1.971)
Industry FE	Yes	Yes
Year FE	Yes	Yes
Obs.	13,622	13,622
Adj. R-squared	0.734	0.771

Panel B: Equal-weighted Regression Excluding Microcaps

Dep. Var.	ROA_{t+1}	
Model	*Equal-weighted Excl. Microcaps*	
	(1)	*(2)*
Log SuppESG Incident	-0.004***	-0.003***
	(-3.774)	(-3.288)
ROA	0.830***	0.815***
	(66.853)	(59.254)
Size		0.006***
		(5.007)
BM		-0.010***
		(-3.736)
Return		0.051***
		(15.496)
PRC		-0.004***
		(-2.676)
Vol		-0.004***
		(-3.196)
CAPX		-0.025***
		(-3.778)
Log Firm Incident		-0.003***
		(-3.300)
Industry FE	Yes	Yes
Year FE	Yes	Yes
Obs.	9,328	9,328
Adj. R-squared	0.750	0.775

Online Appendix Table A2 Equal-weighted portfolio test

This table reports equal-weighted alphas and t-statistics from calendar time monthly portfolio regressions. We construct four portfolios sorted based on the intensity of supply chain ESG incidents. Firms with the best (worst) supply chain ESG are indicated as the low (high) group. *Log SuppESG Incident* is the natural logarithm of one plus *SuppESG Incident*, which is the number of supplier incidents divided by the number of suppliers in year t. The regressions are estimated from July 2012 to June 2023. We regress monthly portfolio return against the market excess returns (*MKT*), Fama and French (1993) size and book-to-market factors (*SMB* and *HML*), and Fama and French (2015) profitability and investment factors (*RMW* and *CMA*) to estimate alpha. Standard errors are estimated by Newey-West correction, and t-statistics are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% (two-sided) levels, respectively.

Panel A: Comparing microcaps versus others

	Full sample	Excluding microcaps	Microcaps only
Average number of suppliers per firm	15.089	19.407	5.704
Aggregated market cap (in USD bn)	116,640	115,680	960
# of obs.	13,622	9,328	4,294

Panel B: Equal weighted portfolio results including microcaps

	Low	2	3	High	Low-High
Alpha	0.257***	0.060	0.198**	0.277**	-0.020
t-stat	(3.901)	(0.553)	(2.374)	(2.114)	(-0.163)
Adj. R-squared	0.975	0.951	0.968	0.940	0.066
Avg. # of firms	461	223	330	325	

Online Appendix Table A3 Heterogeneity by 28 RepRisk topics

This table reports the relation between supply chain ESG and future financial performance (in Column (1)) or stock returns (in Column (2)). The dependent variables in Columns (1) and (2) are ROA_{t+1}, which is the operating income before depreciation divided by average total assets in year t+1, and monthly stock return for each firm measured as in the calendar-time portfolios for every month beginning from July of year t+1 to June of year t + 2, respectively. For brevity, we only report the coefficient of *Log SuppESG Incident* and the associated t-statistics. We decompose supplier incidents into different topics according to RepRisk codification and examine their corresponding value-creation effects. All columns control for *Size*, *BM*, *Return*, *PRC*, *VOL*, *CAPX*, *Log Firm Incident*, and *ROA*. All variables are winsorized at the 1st and 99th percentiles in Column (1), and all regressors are winsorized at the 1st and 99th percentiles in Column (2); the detailed definitions are in Appendix A. Standard errors are clustered at the firm level in Column (1) and are estimated by Newey-West correction in Column (2); and t-statistics are reported in parentheses. ∗, ∗∗, and ∗∗∗ denote significance at the 10%, 5%, and 1% (two-sided) levels, respectively.

Dep. var. =	*ROA*		*Return*	
Incident type:	*Coef.*	t-stat.	*Coef.*	t-stat.
Emission	-0.002	(-0.823)	-0.595**	(-2.426)
Local pollution	-0.003	(-1.233)	-0.539**	(-2.317)
Landscape impacts	-0.004**	(-2.255)	-0.430**	(-2.230)
Overuse and wasting of resources	-0.021**	(-2.526)	-1.134	(-0.985)
Waste issues	-0.001	(-0.269)	-1.165***	(-2.816)
Animal mistreatment	-0.011	(-0.816)	-0.254	(-0.140)
Human rights abuses	-0.003*	(-1.939)	-0.279	(-1.514)
Impact on communities	-0.003*	(-1.751)	-0.389**	(-2.091)
Local participation issues	-0.007	(-1.631)	-0.759	(-1.286)
Social discrimination	-0.008	(-1.330)	-0.720	(-0.743)
Forced labor	-0.008**	(-2.016)	-0.432	(-0.704)
Child labor	-0.001	(-0.198)	0.197	(0.220)
Freedom of association and collective bargaining	-0.004	(-0.963)	0.461	(0.950)
Discrimination in employment	-0.001	(-0.170)	-0.527	(-0.706)
Occupational health and safety issues	-0.003	(-1.053)	-0.217	(-0.705)
Poor employment conditions	-0.002	(-1.208)	0.087	(0.315)
Corruption, bribery, extortion, money laundering	-0.006**	(-1.998)	-0.371	(-1.419)
Executive compensation issues	-0.009	(-0.709)	0.461	(0.524)
Misleading communication	-0.011***	(-3.121)	-0.796	(-1.558)
Fraud	-0.004	(-1.355)	-0.675*	(-1.906)
Tax evasion	-0.002	(-0.406)	-0.234	(-0.293)
Tax optimization	-0.004	(-1.207)	0.227	(0.263)
Anti-competitive practices	-0.006*	(-1.829)	-0.253	(-0.659)
Controversial products and services	-0.008**	(-2.348)	-1.093**	(-2.604)
Products (health and environmental issues)	-0.004	(-1.594)	-0.159	(-0.475)
Supply chain issues	-0.002	(-1.285)	-0.179	(-0.748)
Violation of national legislation	-0.003**	(-2.197)	-0.258	(-1.561)
Violation of international legislation	-0.007**	(-2.039)	-0.484	(-1.153)