WHEN MORE IS LESS: ABOVE-TARGET ENVIRONMENTAL PERFORMANCE AND MARKET RESPONSE AFTER POLLUTION INCIDENTS

ABSTRACT

While exceeding financial performance targets typically garners positive investor responses, the market's reaction to above-target environmental performance (ATEP)—firms surpassing their self-set pollution reduction goals—remains theoretically ambiguous. This study addresses this gap through an abductive, exploratory analysis of U.S. publicly traded firms from 2007 to 2019. We find investors largely ignore ATEP under routine conditions. However, during pollution incidents, ATEP backfires—firms with higher ATEP face harsher market penalties. The negative effect is amplified for firms held by socially responsible investors and those with executive-certified ATEP disclosures. Additionally, penalized firms subsequently reduce reported ATEP and increase target disclosure opacity. These findings reveal context-dependent investor attention to environmental performance and highlight a dynamic feedback loop between market reactions and corporate environmental governance, offering implications for managers and policymakers.

1 INTRODUCTION

In financial markets, beating or exceeding internal performance targets—especially earnings targets—typically elicits positive reactions from investors and can lead to bonus payment for managers (Merchant et al., 2018; Widener, 2006), as it reflects firms' efforts to mobilize resources effectively to maximize shareholder value (Bower & Paine, 2017; Jensen & Meckling, 1976). Concurrently, firms make commitments regarding their contributions to the natural environment, such as pollution control, in response to concerns raised by various stakeholders, including investors, consumers, policymakers, and local communities (e.g., Ansari et al., 2013; Delmas & Toffel, 2004; Slager et al., 2023).

Despite the increasing scholarly and market focus on corporate environmental performances and risks, a critical question remains: Does the same logic of achieving internal targets hold for firms that surpass their environmental targets? Extant work primarily suggests a competitive advantage mechanism, positing that successful completion of environmental targets signifies a firm's capability to manage environmental risks (Dyck et al., 2019; Gore, 2012; Ioannou et al., 2016), thereby enhancing corporate value (Cheng et al., 2023; Flammer, 2013; Khandelwal et al., 2022; Marti & Gond, 2018). This advantage could also serve as a form of "insurance", shielding firms from negative market reactions in the event of adverse occurrences (Godfrey et al., 2009; Peloza, 2006; Shiu & Yang, 2017). Yet, another possibility is that the completion of environmental targets might reveal corporate hypocrisy (Carlos & Lewis, 2018; Wagner et al., 2009), especially when there is a discrepancy between target completion and actual environmental consequences (Effron et al., 2015; Love & Kraatz, 2009; Zyglidopoulos, 2001). This inconsistency could erode trust among investors and lead to market penalty (Bundy et al., 2021; Cormier & Magnan, 1997). Thus, we lack a consensus in theory on the mechanism

through which shareholders respond to corporate environmental target completion. Identifying *how* the market responds to firms' self-set environmental targets is important to investigate the theoretical mechanisms that help explain *why* shareholders care about environmental risks.

Our study aims to solve this puzzle. As the theoretical mechanisms in prior literature do not converge regarding how the market responds to firms' achievement of environmental targets, we conduct an exploratory study. Using a sample of publicly traded U.S. firms from 2007 to 2019, matched to Toxic Release Inventory (TRI) data from the Environmental Protection Agency (EPA), we examine investor reactions to firms' environmental target achievement. Contrary to well-established evidence that meeting or beating financial targets elicits positive market reactions, we find that investors do not react when firms meet or exceed their pollution-reduction targets —what we term "above-target environmental performance" (ATEP). This absence of reaction suggests limited shareholder interest in such achievements under normal conditions and contradicts existing theories on shareholder attitudes toward corporate environmental activities. This puzzling null result motivates our central question: when, if ever, does above-target environmental performance matter to investors?

To answer this, we turned our attention to pollution incidents—abrupt, observable events that attract investor and public scrutiny. We focus on incidents not only for their salience, but because they function as natural stress tests: they force investors to reassess the credibility of firms' prior environmental claims. In these moments, ATEP becomes newly visible and potentially vulnerable. Competing interpretations predict opposite market reactions. On the one hand, prior ATEP may signal strong environmental control systems and risk-management capabilities, leading investors to view incidents as idiosyncratic and to discount their severity (Godfrey et al., 2009; Peloza, 2006; Shiu & Yang, 2017). On the other hand, prior ATEP may

raise expectations about environmental reliability, such that an incident triggers skepticism about the credibility of past disclosures and reveals deeper governance or control failures, amplifying negative market reactions (Love & Kraatz, 2009; Zyglidopoulos, 2001). Given the absence of clear theoretical guidance, we again adopt an exploratory approach and examine incident-level market reactions to assess which interpretation dominates.

Instead of acting as a buffer insulating firms, we find that high ATEP actually backfires: firms that previously beat their pollution targets suffer larger market penalties after incidents. Rather than signifying a competitive advantage or serving as reputational insurance, ATEP appears to expose a credibility gap: investors reassess the firm's environmental claims and penalize what they perceive as disingenuous narratives.

Additionally, we explore two boundary conditions – post hoc – to further probe the significance of ATEP among investors. Market penalties are more pronounced when 1) firms are held by socially responsible investors, who are more sensitive to environmental performance; and (2) when ATEP disclosures are endorsed by top executives, enhancing perceived credibility.

Finally, we analyze firms' reactions to market penalties concerning ATEP after pollution incidents. We observe a learning effect: in response to market penalties following pollution incidents, firms report less ATEP and reduce details about their pollution targets.

In sum, our exploratory research suggests that ATEP acts as an ambiguous signal—largely overlooked under routine conditions—yet becomes a focal point for investor scrutiny during environmental crises. Our findings elucidate how investor attention and credibility logic reshape the meaning of sustainability disclosures in times of crisis.

Our work contributes to the growing literature on corporate environmentalism. First, the findings challenge existing understanding of shareholder environmental concerns by providing

evidence that they might ignore critical environmental indicators in normal circumstances, only to react when significant incidents arise. From the perspective of maximizing long-run shareholder value, corporate environmentally responsible activities have been investigated as accredited by investors and analysts (Ioannou & Serafeim, 2015; Marti & Gond, 2018). From the perspective of stakeholder interaction, corporate environmental efforts could be a sign of hypocrisy, inducing negative responses among stakeholders (Carlos & Lewis, 2018; Wang et al., 2021). Our findings suggest that shareholders might not allocate their limited attention to detailed environmental indicators in normal times as we expected, but their attention would be triggered by critical environmental incidents instead. We also show that environmental targets, even if fulfilled, could backfire and lead to adverse evaluations from investors.

Second, we illustrate an iterative process in which investors play a crucial role in disciplining corporate environmental activities. Prior research has focused on the interconnections and alignment among corporate environmental targets, corporate environmental performances, and national or international climate goals (Cenci et al., 2023; Dietz et al., 2021; Du & Li, 2023; Jiang et al., 2025; Rietbergen et al., 2015). While these studies largely shed light on how government entities initiate and enforce corporate environmentally friendly activities, our findings demonstrate that firms strategically adapt to investor evaluations of their environmental performance, influencing firms' future target-setting. This dynamic underscores the importance of financial market oversight in addressing environmental challenges (Edmans et al., 2012; Mendiluce, 2022; Ramadorai & Zeni, 2024).

2 THEORY BACKGROUND

2.1 Above-target Performances

The market and the public closely monitor firms' performances in meeting or beating earnings forecasts (Bartov et al., 2002). Such forecasts, whether generated by analysts or by firms, function as benchmarks that shape expectations and guide quantitative assessments for corporate managers and investors (Kolasinski et al., 2023). When firms surpass (or miss) these earnings projections, they often face market rewards (or penalties)(Burgstahler & Dichev, 1997; Habib & Hansen, 2008). A robust body of literature demonstrates that exceeding expected earnings typically results in significant positive abnormal stock returns (Ball & Brown, 1968; Waymire, 1984).

Despite the substantial research on the market's rewards for firms' beating or exceeding their financial benchmarks, there is limited understanding of whether a similar dynamic exists regarding corporate environmental forecasts. This gap is both theoretically and practically relevant. Manufacturing firms subject to toxic release inventory program are mandated by the Environmental Protection Agency (EPA) to report their pollution targets and actual emissions annually. This reporting aims to showcase their capability in managing environmental risks and to enhance corporate value in the eyes of both the market and the public, as prior studies in corporate environmentalism and social responsibility indicate (Dyck et al., 2019; Flammer, 2013; Ioannou et al., 2016; Khandelwal et al., 2022).

2.2 Pollution Target and Completion

Pollution targets, commonly investigated as emission reduction pledges, represent firms' self-imposed, quantifiable goals containing forward-looking information made by executives to comply with regulatory rules on pollutant and greenhouse gas emissions or biological footprints. Such targets in firms are often crafted according to national long-term sustainability plans (Campbell, 2021; Cheng et al., 2023; Desai et al., 2023; Ioannou et al., 2016; Ko & Prakash,

2024). The time horizons for these targets vary: short-term goals may span one or two years, near-term plans range from five to ten years, and long-term commitments may exceed twenty years (Desai et al., 2023).

The requirements for firms to disclose their pollution targets and completion serve multiple stakeholders, including society, policymakers, and the firms themselves. First, these targets aim to incentivize firms to fulfill their commitments, thereby contributing to improved environmental conditions of the community (Bolton & Kacperczyk, 2023; Sitkin et al., 2011). Second, these targets facilitate governmental and societal oversight, ensuring that firms' resilience-based target setting aligns with state and global environmental enhancement initiatives (Cenci et al., 2023; Haffar & Searcy, 2018; Krabbe et al., 2015; Mendiluce, 2022). Lastly, by articulating and achieving these targets, firms seek to demonstrate their capability in managing environmental risks, thereby fostering trust among shareholders and the public (Bansal & Clelland, 2004; Flammer et al., 2021).

Scholars have investigated the setting and completion of pollution targets, shedding light on three primary dimensions. First, researchers have explored the antecedents of setting pollution targets or pledges, as well as the adoption of specific initiatives (Bjørn et al., 2022; Campbell, 2021; Desai et al., 2023; Griffin et al., 2017; Mendiluce, 2022; Ramadorai & Zeni, 2024; Reid & Toffel, 2009). Second, the quality of the pollution targets—evaluating their ease, difficulty, or ambition—has been examined (Callery & Kim, 2025; Cheng et al., 2023; Dahlmann et al., 2019; Dietz et al., 2021; Ioannou et al., 2016). Third, scholars have assessed the realization of these pollution targets, investigating the extent to which firms successfully fulfill their commitments (Bolay et al., 2024; Dahlmann et al., 2019; Jiang et al., 2025).

However, there remains a critical gap in understanding whether the very original motivations for firms to commit to these targets and adhere to "rules"—specifically, the desire to impress stakeholders and shareholders—are being effectively realized. In addition, much of the scholarly focus has been on stakeholder and market reaction to corporate environmental performances, the outcome of pollution target completion, rather than the commitment itself (Jiang et al., 2025). Very few studies, if any, have addressed market reaction to the announcement of pollution targets, as opposed to their completion (Desai et al., 2023). This stands in stark contrast to the extensive scrutiny given to the achievements of financial targets or benchmarks.

2.3 Competing Theoretical Expectations about ATEP and Market Response

Extant work largely posits that exceptional environmental performance, similar to strong financial performance, serves as a value-enhancing signal. By publicly disclosing and committing to environmental initiatives, firms not only address increasing environmental concerns from stakeholders (Dahlmann et al., 2019; Kim & Lyon, 2015; Leffel et al., 2024), but also position themselves to gain a competitive edge (Burbano et al., 2023; Darnall et al., 2010; Hart & Dowell, 2010; Pinkse & Busch, 2013). Research indicates that investors respond favorably to firms' environmental targets and achievements, interpreting these commitments as indicators of corporate sustainability that can enhance firm value and mitigate environmental risks (Cheng et al., 2023; Dhanorkar et al., 2017; Flammer, 2013; Ioannou et al., 2016; Khandelwal et al., 2022). Even in the face of adverse events, such value-enhancing signals would act as a form of "insurance" or social capital, alleviating negative market reactions (Godfrey et al., 2009; Peloza, 2006; Shiu & Yang, 2017). From this perspective, ATEP is expected to elicit a positive market response.

Conversely, there is also the possibility that the demonstrated outer performance could become a liability for firms, leading to skepticism among external stakeholders. Some studies have shown that investors may respond negatively to firms' environmental performance information. Without a clear connection between financial and environmental outcomes, corporate environmental initiatives may be viewed as irrelevant (Eccles et al., 2014; Ioannou et al., 2016; Jiang et al., 2025) or as lacking materiality and credibility (Desai et al., 2023). Stakeholders may even consider corporate environmental efforts as expressions of hypocrisy (Carlos & Lewis, 2018; Wagner et al., 2009), intended to impress key audiences. This perception could erode trust among investors and lead to market penalties (Bundy et al., 2021; Cormier & Magnan, 1997). Following this logic, ATEP could trigger a negative market response.

In summary, existing theory presents competing predictions regarding how investors might respond to above-target environmental performance. Clarifying the mechanisms by which the market reacts to firms' self-set environmental targets is essential for understanding *what* shareholders truly value in relation to corporate environmental risks.

3 RESEARCH DESIGN AND EMPIRICAL APPROACH

3.1 Empirical Setting and Data Sources

Our empirical setting consists of publicly listed U.S. firms subject to mandatory environmental disclosure requirements under the Environmental Protection Agency's Toxic Release Inventory (TRI) program. The TRI requires firms to provide detailed, facility-level information on their toxic chemical releases (in pounds) as well as forward-looking pollution targets, allowing us to observe firms' intended and realized pollution abatement over time. We collected target and release levels from the Source Reduction Section (Section 8) of Form R files.

To examine market reactions, we combined TRI data with stock market returns from the Center for Research in Security Prices (CRSP), accounting and financial information from Compustat, institutional ownership data from Thomson Reuters' 13F Holdings and analyst coverage data from the Institutional Brokers' Estimate System (I/B/E/S).

Our dataset also includes information on firm-specific pollution incidents drawn from RepRisk, which offers extensive coverage of global Environmental, Social and Governance (ESG) incidents by screening over 100,000 public sources in 28 languages, commonly used to identify ESG incidents (Connelly et al., 2025; Li & Wu, 2020). The pollution incidents vary in timing and severity and are independent of firms' routine disclosure cycles. Incorporating this information allows us to observe firms' environmental histories in settings that differ in the salience and scrutiny of environmental issues.

Together, these data sources yield a longitudinal firm-level dataset that captures environmental performance disclosures, market reactions, and pollution incidents within a unified empirical framework.

Our final sample covers 637 unique firms, among which 188 experienced pollution incidents. Our sample period started from 2007 and ended in 2019 to exclude the confounding effect of COVID-19.

3.2 Measuring Above-target Environmental Performance

Our focal explanatory variable captures firms' above-target environmental performance (ATEP). We operationalize ATEP by comparing firms' disclosed pollution targets with their realized pollution outcomes. Specifically, we first aggregated all toxic chemicals at the firm level, as investors are more concerned about the total amount of toxic chemical releases for a firm than the release of a specific chemical (Berchicci & Tarakci, 2022). To control the effect of firm size

and production scale on pollution, we used pollution intensity (total pollution amounts divided by total sales). When the target pollution intensity is higher than the actual pollution intensity, it indicates ATEP, suggesting that a firm outperforms in pollution control. In line with this logic, we used the ratio of target-to-actual pollution minus one as a proxy for the above-target environmental performance. A larger value of *ATEP* indicates a larger above-target environmental performance. Specifically, we computed *ATEP* using the following formula:

$$ATEP_t = \frac{Target_t}{Sales_{t-1}} \div \frac{Actual_t}{Sales_t} - 1$$

where $Target_t$ indicates a pollution target level set for year *t* in year *t*-1 and therefore is scaled by the total sales in year *t*-1 ($Sales_{t-1}$). Similarly, the actual pollution amount in year *t* ($Actual_t$) is scaled by the total sales in year *t* ($Sales_t$).

3.3 Market Reactions under Routine Conditions

To examine whether investors incorporate ATEP into firm valuations under routine conditions, we analyze stock market reactions around the disclosure of pollution targets and outcomes. Because TRI filings do not have a single, focal announcement date, we use the last receipt date of a firm's TRI filings within a reporting year as the point at which updated environmental performance information becomes publicly available. Specifically, firms are required to report their toxic release amounts in the previous year and pollution forecasts for the next two years through Form R to the EPA by July 1st of each year. EPA then collects all Form-R filings, publicizes the preliminary data in the middle of July, and eventually publishes the complete audited data in October. As there are no explicit announcement dates for target completion information, we first used the last receipt date of a firm's Toxic Release Inventory (TRI) documents before July 1st as the announcement date of target completion information and calculated a 3-day announcement *CAR*s (*Announcement Day CAR [-1,1]*) to measure the market

reactions to ATEP information. Specifically, we used the *Eventus* from the Wharton Research Data Service (WRDS) to compute cumulative abnormal return (CAR) (Flammer, 2013; Liu et al., 2022; Quigley et al., 2017). The dependent variable (*Announcement Day CAR [-1,1]*) is multiplied by 100, where the abnormal return (AR) is the difference between raw stock return minus expected return estimated by the market model over the 240-day window before the announcement date [-251, -11]. In addition, to capture market reactions over the full filing cycle, we computed market reaction to ATEP from November of a focal year to June of the following year (the entire post-announcement period) with cumulative abnormal monthly return over this period (*Announcement Period CAR*).

3.4 Control Variables

We controlled a stream of factors that are likely to exert influences on investors' reactions. Following current practices, we controlled for pollution intensity (*Pollution*) and environmental risks (*Sentiment*) measured by the sentiment of environmental disclosure in the conference calls.[1] We also controlled a firm's characteristics, including firm size (*Firm size*), firm performance (*ROA* and *MTB*), leverage (*Leverage*), and advertising and R&D intensity (*Advertising intensity* and *R&D intensity*). We also controlled external monitoring, such as institutional shareholders, analysts, and media through institutional ownership (*Institutional ownership*), analyst coverage (*Analyst following*), and media coverage (*Media coverage*).

3.5 Model Specification

We assess whether investors respond to ATEP under routine conditions and estimate the OLS regression in Equation (1):

$$Announcement\ Day\ CAR\ [-1,1]_{k,t}\ (or\ Announcement\ Period\ CAR\ [-1,1]_{k,t}) = \beta_0 +$$

[1] We acknowledge that the pollution intensity may be closely correlated with our predictor. However, our results remain robust if pollution intensity is not controlled.

$$\beta_1 ATEP_{k,t} + \sum \beta_j Control_{k,t} \qquad (1)$$

where *k* and *t* denote firm *k* and year *t*, respectively. The independent and control variables were measured using the most recent available values before the announcement dates of the pollution disclosure. We included firm and year fixed effects to account for unobservable invariant heterogeneities across firms and time. All continuous variables were winsorized at the 1% level, and standard errors were clustered by firm.

4 BASELINE ANALYSIS: INVESTOR REACTIONS IN ROUTINE CONDITIONS

Table 1 presents descriptive statistics and correlations between variables for the full sample. According to the arguments in prior literature, we do not have a consistent answer to the question of how investors would evaluate a firm's ATEP in normal periods (i.e., when no pollution incidents occur). We first set out to investigate this scenario.

[Insert Table 1 Here]

We examined market reactions to the announcements of ATEP at the announcement date in Model 1, and to ATEP over the whole announcement period in Model 2 of Table 2. We regressed these two measures of market reaction on the *ATEP*. Results show that the coefficients of *ATEP* are both insignificant, indicating that investors may not respond to ATEP in the absence of pollution incidents.

[Insert Table 2 Here]

The baseline analysis reveal a consistent pattern: investors do not appear to systematically incorporate above-target environmental performance into firm valuations under routine conditions. While firms vary substantially in the extent to which they meet or exceed their pollution targets, this variation does not translate into observable market reactions in normal periods.

Importantly, this absence of investor response is theoretically consequential. Dominant perspectives suggest that environmental performance disclosures should either enhance firm value by signaling effective risk management or invite skepticism when perceived as symbolic. Our results indicate that, under routine conditions, neither interpretation dominates. Instead, above-target environmental performance appears to remain largely latent in investors' valuation decisions. This raises the question of when, if ever, above-target environmental performance becomes relevant for investor evaluation.

5 FROM ROUTINE CONDITIONS TO SALIENT EVENTS: A THEORETICAL REORIENTATION

The baseline results indicate that investors do not systematically respond to ATEP under routine conditions. These finding challenges prevailing assumptions that environmental performance disclosures are consistently incorporated into market valuations. Rather than suggesting that such disclosures lack informational value, the results point to the possibility that their relevance depends on the broader informational context in which they are interpreted.

Environmental issues are not uniformly salient over time. Periods of routine disclosure are occasionally punctuated by events that draw concentrated attention to firms' environmental practices. During such episodes, investors may reassess prior disclosures, using them to interpret the significance of newly emerging information (Ba et al., 2013; Blacconiere & Patten, 1994; Hill & Schneeweis, 1983). Understanding investor responses to ATEP, therefore, requires attention to contexts in which environmental concerns become focal.

We focus on pollution incidents as one such context. These events generate heightened scrutiny and create opportunities for investors to reinterpret firms' prior environmental disclosures (Barber & Odean, 2008; Ben-Rephael et al., 2017; Klassen & McLaughlin, 1996).

Importantly, we do not treat these incidents as outcomes of interest in themselves. Instead, we view them as attention-activating events that alter how investors process and interpret previously disclosed environmental information.

ATEP becomes particularly consequential in this setting. Prior to an incident, such performance constitutes corporate pollution control information embedded in routine disclosures—one that is costly to interpret and easy to overlook when attention is limited. When a pollution incident occurs, however, investors are confronted with a need to reconcile a favorable historical signal with an unfavorable realized outcome (Bundy et al., 2021; Carpentier & Suret, 2015). This reconciliation opens the interpretive meaning of above-target environmental performance to reassessment. In the sections that follow, we develop competing interpretations of how ATEP may shape investor reactions when firms experience pollution incidents.

5.1 ATEP as Evidence of Underlying Capability

One possibility is that investors interpret prior ATEP as evidence of robust environmental control systems and superior risk management capabilities. From this perspective, pollution incidents are viewed as adverse but potentially idiosyncratic events rather than indicators of failure. Since evaluations of corporate environmental and social risks tend to be path-dependent, relying heavily on their prior knowledge of the firms (Barnett, 2007) - a history of ATEP may reassure investors that the firm possesses the organizational capacity to respond effectively, remediate damage, and prevent future incidents (Fombrun et al., 2000). Under this interpretation, prior ATEP functions as reputational capital. When a pollution incident occurs, investors may discount its severity for firms that have previously demonstrated environmental discipline, resulting in less negative market reactions (Afrin et al., 2022; Godfrey et al., 2009; Shiu & Yang, 2017). In a way, ATEP operates like insurance, buffering the firm against negative reactions

when adverse events occur (Godfrey et al., 2009; Peloza, 2006; Shiu & Yang, 2017) and helping it maintain economic value in challenging circumstances (Godfrey, 2005). If this interpretation dominates, firms with higher prior ATEP should experience less negative market reactions compared with those with lower ATEP following pollution incidents.

5.2 ATEP as a Source of Credibility Failure

An alternative interpretation emphasizes inconsistency rather than capability. From this perspective, prior ATEP raises investor expectations about the firm's environmental reliability (Burgoon, 1993). When an incident occurs, investors may start questioning the authenticity of the firm's prior communications or its actual control capabilities, exacerbating negative investor reactions to the incidents (Blagoeva et al., 2020; Bundy et al., 2021; Carpentier & Suret, 2015). The coexistence of favorable performance claims and a realized environmental failure can trigger skepticism about the firm's disclosures and governance practices and doubts on its ability to manage environmental risks (Love & Kraatz, 2009; Zyglidopoulos, 2001). In this case, the incident does not merely impose a direct penalty; it prompts investors to reassess prior disclosures as evidence of a deeper credibility or control problem, eroding their trust (Bundy et al., 2021). Under this interpretation, ATEP backfires. The higher the prior ATEP firms have, the more severe negative market reactions following pollution incidents they should face, as investors penalize the perceived discrepancy between past claims and present outcomes.

Existing theory does not offer a clear basis for privileging one interpretation over the other. Both views are theoretically plausible, and both hinge on how investors interpret corporate pollution information when attention is heightened. Rather than advancing a single directional prediction, we empirically examine which interpretation dominates when pollution incidents occur, using incident-level market reactions to adjudicate between these rival expectations.

6 INCIDENT ANALYSIS

We examine investor reactions to pollution incidents and assess whether prior ATEP shapes these reactions. In doing so, we assess how previously disclosed ATEP is interpreted when firms experience salient pollution events.

6.1 Model Specification

To examine the market reactions to pollution incidents, we estimate the OLS regression in Equation (2):

$$CAR\ [-1,1]_{i,k,t} = \beta_0 + \beta_1 ATEP_{k,t} + \sum \beta_j Control_{k,t} \qquad (2)$$

where *i, k* and *t* denote incident *i*, firm *k* and year *t*, respectively. Dependent variable (*CAR[-1,1]*) is the 3-day cumulative abnormal return around the announcement of pollution incidents. We identified pollution incidents using RepRisk, which records incidents reported by media outlets, regulators, and civil society organizations.[2] In addition to the control variables we included in Section 3.4, we controlled the nature of the news about the incidents here. As investors tend to react more to severe and high-reach incidents (i.e., those with extensive media reach) (Ben-Rephael et al., 2017; Capelle-Blancard & Petit, 2019), we included the *severity* and *reach of incidents news*. The variables were measured using the most recent available values before the announcement dates of the pollution incidents. We included firm and year fixed effects to account for unobservable invariant heterogeneities across firms and time. All continuous variables were winsorized at the 1% level, and standard errors were clustered by firm.

6.2 Results

Table 3 presents descriptive statistics of variables for the sample of firms that experienced incidents. The mean of *CAR* is -0.10% and is significantly different from zero at the 5% level,

[2] A U.S. pollution incident is identified if RepRisk's description of incident issues includes "local pollution issues", and U.S. is listed as the impacted region.

suggesting that, on average, investors react negatively to pollution incidents. The mean of ATEP (0.29) indicates that the target pollution intensity is, on average, higher than the actual pollution intensity, supporting the prevalence of ATEP in our sample. The distributions of other control variables are consistent with those in prior literature (Liu et al., 2022). Additionally, the variance inflation factor (VIF) for all variables is 1.36, well below the commonly cited threshold of 10 for diagnosing multicollinearity concerns (Gujarati, 2003).

[Insert Table 3 Here]

In the Appendix A1 and A2, we report the temporal and industry pattern of firm-incident observations over our sample period. As shown in Table A1, the frequency of firm-incident observations remained relatively steady from 2008 to 2019. According to Table A2, the industries that received the most serious impact from pollution incidents are Electric, Gas, and Sanitary Services, Petroleum Refining and Related Industries, and Chemicals and Allied Products.

We first examined the effect of ATEP on market reactions to pollution incidents. Table 4 shows relevant results. In Model 1, where no control variables are included, we found the coefficient of *ATEP* is negative and significant (β = -0.080; $p < 0.01$). In Model 2, where all controls are included, the estimated coefficient of *ATEP* is -0.091 ($p < 0.01$). These findings suggest that investors react more negatively to pollution incidents when the larger ATEP is provided, supporting the curse effect. In terms of economic significance, one standard deviation in *ATEP* leads to a 0.13% (1.47 × 0.09 = 0.13%) decrease in 3-day cumulative abnormal return (*CAR*) surrounding the incident announcement date, which is approximately 1.3 times the average market reaction to a pollution incident in our sample.

We also employed two placebo tests. First, the relevance of ATEP for a U.S. firm is limited to pollution incidents that occur within the U.S. Second, ATEP may only influence investors' evaluation of pollution incidents rather than other types of environmental incidents, such as animal mistreatment. Therefore, we examined two types of incidents that lack relevance to ATEP: incidents occurring outside the U.S. and incidents of environmental issues unrelated to pollution. If our theory is valid, we would expect to find insignificant results for these two types of incidents. Models 3 and 4 in Table 4 confirm our expectations.

[Insert Table 4 Here]

6.3 Robustness Checks

To examine the robustness of our results, we performed several additional tests, as reported in Table 5. First, we used industry and year-fixed effects as an alternative model specification in Model 1. Second, we replaced our dependent variable with 5-day and 7-day cumulative abnormal returns (CAR [-2,2] and CAR [-3,3]) in Models 2 and 3, respectively. Third, we measured ATEP in two alternative ways. Since investors usually rely on a simple indicator, such as whether a firm has accomplished emission reduction goals, to evaluate the performance (Bartov et al., 2002), in Model 4, we used a dummy variable to indicate whether a firm meets or exceeds its pollution target, that is, whether it provides ATEP (*ATEP dummy*) as an alternative independent variable. It equals to 1 if the ratio of target pollution intensity to actual pollution intensity is greater than 1 and 0 otherwise. In Model 5, we scaled pollution amounts by production cost instead of sales to control for the size effect on pollution, because sales could be more volatile than production, where production cost is the sum of the change in inventory plus the cost of goods sold. Overall, our results remain robust across all five tests.

[Insert Table 5 Here]

6.4 Extensions and Boundary Conditions

6.4.1 Socially Responsible Institutional Investors

Investors' tendency to explore and use corporate pollution information depends on their attention to such indicators (Chen et al., 2022). Socially responsible institutional investors (SRI), who prioritize environmental performance in their investment decision-making (Oehmke & Opp, 2025), are inclined to pay attention to firms' environmental information when assessing pollution incidents. Moreover, they may help interpret ATEP and share their insights and concerns with other investors, enhancing the visibility of the pollution indicators (Crane et al., 2019). We thereby expect that the negative relationship between ATEP and the market response to corporate pollution incidents to be more pronounced for firms with socially responsible institutional investors. Following Heath et al. (2023), we identified SRI based on three data sources: Bloomberg socially responsible funds data, Morningstar Socially Conscious data, and the US Sustainable Investment Forum (US SIF) membership list. Based on this classification, we constructed a dummy variable indicating the presence of socially responsible investors (*SRI*) and interacted it with *ATEP*. From Model 1 of Table 6, consistent with our expectations, we found a negative and significant coefficient of $ATEP \times SRI$ (β = -0.204; $p < 0.1$).

6.4.2 Information Credibility

Information credibility may influence investors' willingness to use information (Thayer, 2011). We examined whether the main effect varies with the credibility of *ATEP*. TRI filing certified by top executives (e.g., CEOs and COOs) are expected to be more credible, as it embodies managerial intent. We expect the negative relationship between *ATEP* and market reaction to pollution incidents to be strengthened for firms whose relevant file is certified by top executives. Following Berchicci & Tarakci (2022), *ATEP* is classified as a certified one if the signatory titles

on TRI filings refer to top executives.[3] Pertaining to this, we constructed a dummy variable indicating certified pollution information (*Certification*) which equals 1 if a firm has at least one TRI filing signed by top executives and 0 otherwise. We then interacted *ATEP* with *Certification* to test the moderating effect of feedback credibility. From Model 2 in Table 6, the coefficient of *ATEP* × *Certification* is -0.417 ($p < 0.05$), suggesting that investors tend to put greater weights on more credible ATEP. This results in more negative market reactions to pollution incidents.

[Insert Table 6 Here]

6.4.3 Subsequent Adjustments following Pollution Incidents

As we documented above, investors penalize firms that have previously delivered larger ATEP by reacting more negatively to their pollution incidents, leading to a significant reduction in firm value. In response to such potential risks, managers may adjust their reporting practices or pollution control strategies to provide less information on ATEP.

To examine this conjecture, we analyzed the subsequent adjustments in the reporting of ATEP following the pollution incidents with negative market reactions, which arouse the risk awareness of managers. Specifically, we regressed the reporting of ATEP in the next year (*ATEP*) on the number of pollution incidents with negative market reactions (*# of incidents with negative reactions*). We also included the number of pollution incidents with positive market reactions (*# of incidents with positive reactions*) to control the general effect of pollution incidents on ATEP. All other controls are consistent with our baseline model. As shown in Model 1 of Table 7, the coefficient of *the number of incidents with negative market reactions* is -0.298 ($p < 0.05$), while the coefficient of *the number of incidents with positive market reactions*

[3] Following Berchicci & Tarakci (2022), the titles of top executives include President, Owner, Vice-President, CEO, COO, CFO, Chairman, Chief Administrative Officer, Chief Environmental Officer, Corporate Manager, Chairman, Director, Treasurer, Secretary, and General Counsel.

is insignificant. These findings suggest that market penalties of pollution incidents alert managers to the costs of reporting ATEP. More importantly, managers learn lessons from market penalties and become more cautious in disclosing ATEP.

Similarly, we investigated whether managers also increase the opacity of pollution forecasts as an alternative response. In TRI filings mandated by EPA, firms are required to provide pollution targets for the following two years. However, to alleviate public scrutiny on pollution activities (Karpoff et al., 2005), firms may opt to simply provide identical numbers for the next two years, thereby avoiding disclosing additional pollution forecasts which can be unutilized by the public to infer pollution control performance (Desai et al., 2023). By doing so, managers may intentionally increase the opacity of ATEP information. To measure such opacity, we computed the percentage of form TRI filings with identical forecasts for the following two years (*Opaque ATEP*) and regressed it on the *# of incidents with negative reaction*. As shown in Model 2 of Table 7, the estimated coefficient of the *# of incidents with negative reactions* is positive and statistically significant ($\beta = 0.006$; $p < 0.10$), suggesting that managers refrain from providing detailed pollution control information in response to market penalties for pollution incidents.

[Insert Table 7 Here]

7 DISCUSSION AND CONCLUSION

Firms and their top management teams are rewarded when corporate financial performance targets are met or exceeded. Despite growing scholarly attention to corporate environmental performance, there is still a lack of consensus on whether the same logic applies to corporate environmental targets and their fulfilment. This study adopts a question-driven exploratory approach, focusing on firms required to disclose their pollution targets and completion, to investigate how the market responds to these self-set environmental targets. Our empirical

findings clearly show that the market largely ignores above-target environmental performance (ATEP) under normal conditions. Notably, investors appear to care about ATEP only in the aftermath of pollution incidents, where high ATEP backfires: firms beating corporate pollution targets would receive larger market penalties after pollution incidents.

In addition, we find that this negative relationship between ATEP and market response is more pronounced for firms with heightened investor attention to environmental indicators and higher perceived credibility of those disclosures. We also identify a dynamic interplay between firms and the market. That is, after facing penalties for discrepancies between pollution incidents and previously reported ATEP, firms tend to adjust their pollution control strategies by toning down their reported ATEP and avoiding detailed pollution forecasts.

7.1 Theoretical Implications

Our study makes at least two contributions to the corporate environmentalism literature. First, we clarify when and how investors engage with firms' above-target environmental performances. While existing studies have highlighted that shareholders and stakeholders possess environmental concerns that push firms to disclose their environmentally friendly activities (Ansari et al., 2013; Bolay et al., 2024; Campbell, 2021; Delmas & Toffel, 2004; Flammer et al., 2021; Ioannou et al., 2016; Slager et al., 2023), they have been inconclusive regarding market response to the (over)completion of firms' environmental targets. Our study demonstrates that investors typically do not respond to corporate pollution target achievement, even if the target is more than just achieved. Rather, their attention is piqued by critical pollution incidents. Consequently, instead of functioning as a mitigating "insurance", above-target environmental performance backfires and results in adverse investor evaluations.

Second, we document a dynamic interplay between market power and corporate environmental governance. Most research on corporate environmental commitments has focused on firms' proactive or reactive strategies in response to stakeholder or shareholder pressures (Campbell, 2021; Dyck et al., 2019; Kölbel et al., 2020). Our paper illustrates a dynamic learning loop. Firms initially disclose ATEP to signal their commitment to pollution control, only to face penalties from investors for inconsistencies between ATEP and unfavorable pollution incidents. Ultimately, firms providing ATEP learn from the negative market reactions following such incidents, leading them to temper their ATEP disclosures in the future. This underscores the importance of investor engagement in monitoring firms' environmental activities.

7.2 Limitations and Future Research

Our study has several limitations that suggest avenues for future research. First, our focus on toxic chemical releases restricted the scope of our sample. Future studies could strengthen the generalizability of our findings by examining other environmental performance indicators, such as carbon emissions. Second, stakeholders may exhibit varying levels of leniency toward firms in regions with less stringent environmental commitments. We encourage future work to explore how political ideology across different states and countries influence market evaluations to corporate environmental indicators.

7.3 Managerial and Policy Implications

Our findings carry important managerial and policy implications. For managers, it is advisable to be cautious in disclosing the above-target environmental performance, as this could raise shareholder doubts about the effectiveness of corporate environmental risk control measures. For policymakers, our results indicate the potential for integrating market dynamics with policy instruments to incentivize and regulate corporate pollution abatement activities. To better

motivate firms to disclose accurate and comprehensive environmental information, supportive policies that allow for case-by-case investigation into these processes could help mitigate punitive market responses.

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Table 1. Descriptive Statistics and Correlation Table (Full Sample)

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1	CAR[-1,1](%)	-0.12	2.16	1.00											
2	ATEP	1.30	1.52	-0.03	1.00										
3	Severity of incidents news	1.50	0.54	0.02	0.00	1.00									
4	Reach of incidents news	1.51	0.56	-0.01	0.03	-0.09	1.00								
5	Pollution intensity	3.70	3.82	-0.02	-0.20	-0.03	-0.02	1.00							
6	Sentiment	0.06	0.18	0.02	-0.03	-0.01	0.00	0.16	1.00						
7	Firm size	10.55	1.43	0.06	0.00	0.06	0.05	-0.24	-0.01	1.00					
8	ROA	0.05	0.06	-0.01	-0.04	0.04	0.02	-0.22	-0.09	0.13	1.00				
9	MTB	1.55	0.67	-0.01	-0.02	-0.01	0.00	-0.33	-0.11	-0.06	0.54	1.00			
10	Leverage	0.28	0.14	0.02	-0.01	-0.06	-0.02	0.18	0.11	-0.30	-0.37	0.01	1.00		
11	Advertising intensity	0.01	0.01	0.00	-0.01	-0.01	0.03	-0.33	-0.08	0.01	0.27	0.55	0.16	1.00	
12	R&D intensity	0.01	0.02	0.00	-0.01	0.00	0.01	-0.18	-0.09	-0.01	0.26	0.44	-0.09	0.24	1.00
13	Institutional ownership	0.56	0.31	0.01	-0.02	-0.03	0.04	0.07	-0.04	-0.19	-0.04	-0.08	-0.04	-0.07	0.03
14	Analyst following	2.49	0.86	0.01	-0.05	0.01	-0.02	-0.22	-0.04	0.26	0.23	0.27	-0.07	0.17	0.13
15	Media coverage	4.15	1.75	0.02	-0.05	0.07	0.03	-0.13	-0.09	0.25	0.21	0.14	-0.23	0.08	-0.05

		13	14
14	Analyst following	0.02	
15	Media coverage	0.16	0.51

Note. N=6,335.

Table 2. Market Reactions to Pollution Control Feedback in Normal Times

DV =	Model 1 Announcement Day CAR [-1,1]	Model 2 Announcement Period CAR
ATEP	-0.073	-0.039
	(-1.467)	(-0.997)
Pollution intensity	-0.002	-0.215*
	(-0.053)	(-1.819)
Sentiment	-2.193	34.010
	(-0.088)	(0.424)
Firm size	-0.136	-0.840
	(-1.127)	(-1.639)
ROA	0.501	-12.439***
	(0.498)	(-3.643)
MTB	0.021	0.372
	(0.167)	(0.989)
Leverage	-0.505	-0.194
	(-0.989)	(-0.104)
Advertising intensity	0.491	-48.385*
	(0.037)	(-1.720)
R&D intensity	-1.216	14.630
	(-0.179)	(0.882)
Institutional ownership	0.098	0.523
	(0.414)	(0.475)
Media coverage	0.031	0.008
	(0.907)	(0.074)
Constant	1.166	6.979
	(1.129)	(1.542)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Observations	5,967	6,335
Adjusted R^2	0.015	0.020

Note. Standard errors are clustered by the firm, and t-statistics are reported in parentheses. Two-tailed tests. *p < .1. **p < .05. ***p < .01.

Table 3. Descriptive Statistics and Correlation Table (Firms with Incidents Sample)

		Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1	CAR[-1,1](%)	-0.10	2.09												
2	SRI	0.90	0.26	0.01											
3	Certification	0.14	0.34	0.01	0.06										
4	ATEP	0.29	1.47	-0.03	0.02	-0.03									
5	Severity of incidents news	1.49	0.53	-0.01	0.00	-0.01	0.00								
6	Reach of incidents news	1.50	0.54	0.01	-0.01	0.00	0.03	-0.09							
7	Pollution intensity	4.21	3.51	-0.01	-0.11	-0.03	-0.21	-0.02	0.02						
8	Sentiment	0.07	0.21	0.03	0.01	-0.08	-0.03	0.00	0.00	0.16					
9	Firm size	10.57	1.38	0.05	0.35	0.36	0.00	0.07	0.03	-0.23	-0.01				
10	ROA	0.05	0.05	-0.02	0.11	0.13	0.00	0.00	-0.01	-0.24	-0.10	0.10			
11	MTB	1.47	0.57	-0.02	0.12	0.00	-0.01	-0.02	-0.05	-0.30	-0.12	-0.06	0.55		
12	Leverage	0.29	0.13	0.03	-0.08	-0.34	-0.03	-0.03	-0.02	0.29	0.12	-0.27	-0.39	-0.08	
13	Advertising intensity	0.00	0.01	0.01	0.06	-0.02	-0.01	-0.01	-0.02	-0.23	-0.09	0.01	0.22	0.39	0.07
14	R&D intensity	0.01	0.02	-0.01	0.11	-0.02	-0.01	-0.01	0.02	-0.21	-0.10	0.01	0.32	0.51	-0.12
15	Institutional ownership	0.60	0.29	0.04	0.05	-0.07	-0.02	-0.04	0.04	0.02	-0.05	-0.20	-0.04	-0.06	-0.03
16	Analyst following	2.57	0.74	0.01	0.29	-0.02	-0.03	0.00	-0.05	-0.26	-0.04	0.23	0.21	0.25	-0.09
17	Media coverage	4.34	1.53	0.02	0.21	0.16	-0.03	0.05	0.03	-0.18	-0.09	0.24	0.16	0.09	-0.24

		13	14	15	16
14	R&D intensity	0.30			
15	Institutional ownership	-0.04	0.05		
16	Analyst following	0.13	0.18	0.03	
17	Media coverage	0.06	0.01	0.16	0.50

Note. N=2,208.

Table 4. ATEP and Market Reactions to Pollution Incidents

	Model 1	Model 2	Model 3	Model 4
	Base		Placebo tests	
	Without Controls	*Full Model*	*Incidents out of the U.S.*	*Incidents of other environmental issues*
DV=	CAR[-1,1](%)			
ATEP	-0.080***	-0.091***	-0.065	-0.069
	(-2.850)	(-3.468)	(-1.327)	(-1.261)
Severity of incidents news		-0.058	0.306**	-0.121
		(-0.641)	(2.180)	(-0.692)
Reach of incidents news		0.091	-0.459***	0.013
		(1.034)	(-3.037)	(0.120)
Pollution intensity		-0.107*	0.141	-0.039
		(-1.718)	(0.814)	(-0.786)
Sentiment		0.291	-0.380	-0.186
		(1.340)	(-0.450)	(-0.451)
Firm size		0.269	1.273**	-0.230
		(0.881)	(2.143)	(-0.379)
ROA		-0.829	-2.849	-5.038
		(-0.385)	(-0.627)	(-1.394)
MTB		0.367	0.071	0.174
		(1.472)	(0.188)	(0.449)
Leverage		0.612	-2.755	-4.516**
		(0.530)	(-1.051)	(-2.282)
Advertising intensity		1.214	8.159	-9.215
		(0.108)	(0.287)	(-0.807)
R&D intensity		-17.078	19.550	-59.682***
		(-1.089)	(0.406)	(-3.818)
Institutional ownership		0.321	-0.070	-0.035
		(0.941)	(-0.066)	(-0.067)
Analyst following		-0.031	-0.039	0.356**
		(-0.252)	(-0.126)	(2.127)
Media coverage		0.064	0.169	0.006
		(1.187)	(1.556)	(0.088)
Constant	0.009	-3.366	-14.528*	3.751
	(0.243)	(-1.004)	(-1.897)	(0.573)
Firm FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	2,208	2,208	493	906
Adjusted R^2	0.009	0.009	0.090	0.069

Note. Standard errors are clustered by the firm, and t-statistics are reported in parentheses. Two-tailed tests. *$p < .1$. **$p < .05$. ***$p < .01$.

Table 5. Robustness Checks

	Model 1	Model 2	Model 3	Model 4	Model 5
	Industry FE	*Alternative event windows*		*Alternative feedback measures*	
DV =	CAR [-1,1](%)	CAR[-2,+2](%)	CAR[-3,+3](%)	CAR[-1,1](%)	CAR[-1,1](%)
ATEP	-0.062**	-0.130**	-0.095*		
	(-2.285)	(-2.560)	(-1.678)		
ATEP dummy				-0.209*	
				(-1.782)	
ATEP (scaled by production cost)					-0.097***
					(-3.407)
Controls	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	No	No	No	No
Firm FE	No	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Observations	2,280	2,204	2,203	2,208	2,204
Adjusted R^2	0.019	0.020	0.032	0.008	0.010

Note. Standard errors are clustered by the firm, and t-statistics are reported in parentheses. Two-tailed tests. *p < .1. **p < .05. ***p < .01.

Table 6. Cross-sectional Analyses: Investor Attention and Creditability of Feedback

	Model 1	Model 2
DV =	CAR[-1,1](%)	
ATEP × SRI	-0.204*	
	(-1.684)	
ATEP × Certification		-0.417**
		(-2.073)
SRI	-0.176	
	(-0.329)	
Certification		0.610
		(1.519)
ATEP	0.101	-0.002**
	(0.824)	(-2.298)
Controls	Yes	Yes
Firm FE	Yes	Yes
Year FE	Yes	Yes
Observations	1,784	2,208
Adjusted R^2	0.021	0.009

Note. Standard errors are clustered by the firm, and t-statistics are reported in parentheses. Two-tailed tests. *p < .1. **p < .05. ***p < .01.

Table 7. Subsequent Adjustments Following Pollution Incidents

DV =	Model 1 ATEP	Model 2 Opaque ATEP
# of incidents with negative reactions	-0.298**	0.006*
	(-2.178)	(1.656)
# of incidents with positive reactions	-0.118	0.003
	(-1.006)	(0.939)
Pollution intensity	0.955***	-0.016***
	(8.530)	(-4.217)
Sentiment	-1.227*	-0.081**
	(-1.771)	(-2.179)
Firm size	0.046	-0.004
	(0.182)	(-0.320)
ROA	-1.249*	-0.000
	(-1.741)	(-0.010)
MTB	-0.056	0.001
	(-0.623)	(0.232)
Leverage	-0.502	0.059
	(-0.773)	(1.240)
Advertising intensity	-20.821**	1.192
	(-1.981)	(1.123)
R&D intensity	-1.528	-0.242
	(-0.505)	(-0.981)
Institutional ownership	-0.586	-0.019
	(-1.249)	(-0.779)
Analyst following	-0.267	-0.014
	(-1.405)	(-1.570)
Media coverage	0.058	0.010**
	(0.797)	(2.407)
Constant	0.037	0.774***
	(0.017)	(7.189)
Firm FE	Yes	Yes
Year FE	Yes	Yes
Observations	6,349	6,419
Adjusted R^2	0.102	0.488

Note. Standard errors are clustered by the firm, and t-statistics are reported in parentheses. Two-tailed tests. *p < .1. **p < .05. ***p < .01.

APPENDIX

Table A1. Distribution of firm-incident observations over years

Year	# of firm-incident observations	Percentage (%)
2007	27	1.22
2008	140	6.34
2009	91	4.12
2010	129	5.84
2011	209	9.47
2012	214	9.69
2013	268	12.14
2014	250	11.32
2015	179	8.11
2016	156	7.07
2017	187	8.47
2018	188	8.51
2019	170	7.70
Total	2,208	

Table A2. Distribution of firm-incident observations across industries

Description	2-digit SIC code	# of firm-incident observations	# of unique firms
Electric, Gas and Sanitary Services	49	811	40
Petroleum Refining and Related Industries	29	357	9
Chemicals and Allied Products	28	216	27
Transportation Equipment	37	109	16
Food and Kindred Products	20	107	7
Oil and Gas Extraction	13	105	16
Paper and Allied Products	26	97	4
Unclassified	99	97	11
Metal Mining	10	57	4
Primary Metal Industries	33	40	8
Industrial and Commercial Machinery and Computer Equipment	35	40	9
Measuring, Photographic, Medical, & Optical Goods, & Clocks	38	40	9
General Merchandise Stores	53	27	2
Electronic & Other Electrical Equipment & Components	36	25	6
Rubber and Miscellaneous Plastic Products	30	10	1
Lumber and Wood Products, Except Furniture	24	9	2
Wholesale Trade - Nondurable Goods	51	9	2
Fabricated Metal Products	34	8	3
Stone, Clay, Glass, and Concrete Products	32	8	2
Coal Mining	12	8	1
Wholesale Trade - Durable Goods	50	6	1
Mining and Quarrying of Nonmetallic Minerals, Except Fuels	14	5	1
Textile Mill Products	22	4	1
Transportation by Air	45	3	1

Heamy Construction, Except Building Construction, Contractor	16	2	1
Pipelines, Except Natural Gas	46	2	1
Miscellaneous Retail	59	2	1
Miscellaneous Manufacturing Industries	39	2	1
Furniture and Fixtures	25	2	1
Total		2,208	188