The Impact of Corporate Environmental Misconduct on Bond Issues and Seasoned Equity Offerings*

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Abstract

We investigate to what extent U.S. companies fined by the Environmental Protection Agency (EPA) are penalized by investors when those firms issue corporate bonds or equity after an environmental violation. Our results show higher spreads for debt issues and higher price discounts in seasoned equity offerings (SEOs) when firms raise capital right after the fine imposed by the EPA. However, economically, the effect on debt is significantly lower than on equity. While for debt issues, the spread is 10% higher for fined firms, for SEOs, the price discount is almost 120% larger. Consistent with the effect of environmental misconduct on financing costs, we also find that the probability of issuing new debt by fined firms increases while the probability of issuing equity decreases significantly. Our results suggest that fined firms can afford the higher cost of new debt but not the higher cost of raising new equity. Moreover, our cross-sectional tests support our baseline results as we find higher issuing costs in polluting industries. Besides, we identify differential effects for financially constrained and opaque firms.

Keywords: Environmental misconduct; Corporate misconduct; Debt issuance, Seasoned equity offering, CSR, ESG.

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1 Introduction

There is an increasing interest in academia about the changes in firms' awareness about their negative and positive externalities when firms compete in their markets. That is why different ratings associated with ESG (and CSR) performance have emerged to help consumers and investors to differentiate socially responsible firms from firms with lower environmental and social standards that are more likely to commit corporate wrongdoings when they operate. However, prior literature has also shown evidence that firms often engage in greenwashing activities to mitigates the negative impact of corporate misconduct. They do so by improving their performance on social and environment dimensions before and after of a misconduct as a way to reduce potential penalties imposed by the regulator, costumers and investors (Hong et al., 2019; Ferrés and Marcet, 2021; Akey et al., 2021). Hence, this prior evidence raises the issue whether investors are able to incorporate into price the negative impact of corporate wrongdoings, efficiently.

For investors this could be challenging as corporate misconduct can be preceded by new ESG efforts by firms as a direct consequence of the greenwashing. In addition, currently available data for measuring firm greenness is imprecise, self-reported, and unaudited, which difficult an appropriate empirical assessment of the truly environmental standard of firms. For example, Berg et al. (2022) compare to what extent environmental, social, and government (ESG) ratings consistently capture each of these dimensions at the firm level. Evaluating a set of six rating providers, the authors identify a systematic divergence among ESG ratings, explained mainly by differences in how different concepts are measured and the scope of the elements included in the index. Overall, this divergence in ESG ratings makes it hard to evaluate the sustainability performance of firms and challenges the possibility of investors to incorporate into prices the impact of environmental violations.

This research aims to overcome the greenwashing and measurement problems by directly link environmental violations with bond issues and equity issuances. Our empiri-

cal design provide an ideal setting in which investors have to provide more financing to firms that just committed environmental violations. We argue that when debt and equity issuances are preceded by environmental violations within a short period of time (up to a year), it makes harder for firms to engage in greenwashing activities or to deliberate influence ESG ratings before raising capital.

To develop our empirical design, we look at environmental violations available for a large sample of US firms. From the Environmental Protection Agency (EPA) we collect more than 13,000 environmental violation from the years 2000-2019 and we link them with debt and equity issuances. EPA is a nationwide agency that monitors the environmental performance of all the companies (public and private) and tracks the environmental violations of all companies at the plant-level. In addition, from SDC Platinum database, we obtain the exact date and characteristics of bond emissions and seasoned equity offering for the same sample period as environmental violations. Then, by putting together this two sources of information, we identify all the environmental violations that took place right before debt or equity issuances to test whether investors incorporate into prices the negative effect of corporate misconduct, above and beyond the ESG performance of firms. On one hand, violating environmental regulation indicates a lack of commitment to the environment and the society by these firms; therefore, it provides a clear signal for investors regarding the environmental commitment of these firms that could negatively affect future cash flows (sustainability). On the other hand, by focusing on new bond emission and SEOs, we are considering a subset of investors (more sophisticated) that are willing to provide more funding to firms in need for a fair price.

We aim to investigate whether investors involved in the financing deals react to environmental violations by asking higher a spread in bonds and a higher stock discount in seasoned equity offerings when deals are associated with misconduct firms. Our results show this is the case as we document higher spreads for bond issues and higher price discounts in SEOs after the fines imposed by the environmental agency. Economically,

however, the effect on debt is significantly lower than on equity. While for issued debt, we find a reduction of around 10% in the spread for fined firms, in the case of SEO, the price discount is almost 120% larger. Consistent with the effect of misconduct on financing costs, we also find that the probability of issuing debt after the fine increases, while the probability of issuing equity decreases, after the environmental violation. These results are consistent with the pecking order theory (Myers and Majluf, 1984), where firms tend to prefer debt issuances as they are cheaper than equity issuances even after a corporate misconduct.

We perform different cross-sectional test to support our results. First, we find that investors ask higher spreads after an environmental violation only in polluting industries, which suggests that firms that operate in non-polluting industries an environmental violation is not relevant to obtain additional funding. In contrast, for SEOs investors ask higher discounts in both kind of industries, although the impact is larger in polluting industries. To some extent, this evidence points out to market segmentation between debt and equity financing.

One concern about our results is that the probability of having an environmental misconduct could be correlated with level of financial performance of firms. For instance, firms with higher financing constraints could be reluctant to pursue new investments to comply with the environmental standards (i.e carbon emissions) imposed by the EPA, which makes those firms more likely to suffer an environmental violation in the future. If that is the case, the higher bond spread and stock discount that we observe after a environmental violation could be mainly driven by the financial difficulties that the firms is facing to raise capital. To rule out this alternative explanation we split the sample in financially constrained and unconstrained firms, and we find that the negative effect of misconduct affects both groups, although the impact is higher for financially constrained firms. In sum, these results suggest that investor impose an additional cost to firms that need to raise more capital even after controlling for the level of financing constraints.

Asymmetric information plays an important role on debt and equity issuances (Jensen and Meckling, 1976; Leland and Pyle, 1977; Derrien et al., 2016). We also provide further evidence that depending on the level of asymmetric information a negative corporate event such as an environmental violation could affect the cost of funding differently. Using traditional proxies (analyst coverage, bid-ask spread and volume) for asymmetric information (Kelly and Ljungqvist, 2012; Derrien et al., 2016), we find that impact of an environmental violation just before a firm raises capital (bonds and SEOs) is larger on firms with higher levels of asymmetric information. Importantly, firms that issue more equity after the misconduct are the most affected by the asymmetric information, which is consistent with the pecking order theory in which equity is more sensitive to information disclosure than debt (Myers and Majluf, 1984).

Our results contribute to different streams of literature. First, we add to the literature on CSR as a tool to reduce the cost of funding. Previous literature has shown that firms exhibiting higher CSR scores experience a mild adverse market reaction to SEO announcements (see Feng et al., 2018; Dutordoir et al., 2018). However, SEO proceeds are kept as cash and not used in investing activities, as we would expect if these CSR activities would aim at enhancing shareholder value. These contradictory results (lower SEO discounts and its use of proceeds) may be explained by the use of a specific CSR score. Economidou et al. (2023) relate ESG scores with the IPO underpricing as way to show that firms with ESG scores before the IPO exhibit higher returns on the first day of trading. However, they rely on the coverage of a single rating and the level of information environment is different between an IPO and a SEO. We contribute to the previous literature, by showing that our approach will help to overcome the measurement problem described above and directly link the SEO sotck discount with environmental violations.

From the debt side, prior literature has shown that firms involve in lawsuits that affect their reputation experience a decrease in bond values and a tightening of borrowing terms in China (Gu et al., 2023). Graham et al. (2008) show that corporate misreports, a

type of firm misconduct, negatively affect the characteristics of loan contracts after the event compared to those loan contracts set before the event (high loan spreads, shorter maturities, etc.). Chava et al. (2018) also show that revelations of financial misreporting by borrowers negatively affect loan contracts for these firms. These authors show misreporting firms pay greater loan spreads during the next six years of the misreporting event. However, this kind of misconduct affects the assessment of the true firm value rather than the impact of environmental violations on the cost of funding. Important is to notice that the penalty imposed by the EPA could affect future cash flows (higher compliance costs), which in turn increases the cost of funding.

Our study also fits in the literature on the effect of environmental violations on market value. Konar and Cohen (2001) study the impact of environmental measures on firm intangible assets, proxied by the Tobin-q, for a sample of US S&P 500 firms. They find that firms involved in environmental lawsuits and with a high level of toxic chemicals emitted per firm reduce firm intangibles assets. Karpoff et al. (2005) studied the impact of environmental violations on firm equity. Using a sample of US firms, they document that firms that violate environmental regulations suffer lost market value. This loss is akin to the fines received by these firms. Then, they conclude that there are no reputational losses associated with environmental violations. Along the same lines, but not looking at environmental events specifically, Karpoff et al. (2008) study how firm misconduct, particularly financial misrepresentation, affects a firm's market value and reputational costs using a sample of 585 firms targeted by SEC enforcement actions between 1978 and 2002. They document that the legal penalties are minor compared to reputational costs imposed by the market. For each dollar, a firm misleadingly inflates its market value, losing $4.08, primarily to reputational losses. Armour et al. (2017) conduct a similar exercise for a sample of UK firms. Exploiting a peculiarity in the UK market regarding the timing in which information about misconduct is released to the market, they document that reputational losses are significant, nine times the amount of legal fines paid. The

reduction in market value is mainly observed when investors and customers are harmed, but not third parties.

The remainder of the paper proceeds as follows. In section 2, we describe the different sources of information used in this study and the empirical strategy. In section 3, we presentr the baseline empirical results. In section 4, we show (linear) probability models of debt and equity issuance, in section 5, we explore several cross-sectional heterogeneity in our baseline results, and finally, we conclude in section 6.

2 Data and Empirical Method

2.1 Dataset

We merged five datasets to conduct our empirical analysis. We work with information of all the environmental fines applied to U.S. firms by the Environmental Protection Authority (EPA), collected in the Violation Tracker database. Bond issues and seasoned equity offering (SEO) information at the deal level is obtained from SDC Platinum database. We control by firm's CSR performance using score information based on MSCI ESG (formerly know as KLD) database. Additional control variables at the firm level at retrieved from COMPUSAT database; and stock price information is obtained from CRSP. Our study span the sample period from 2000-2019.

- Violation Tracker: we focus on corporate violations in which the primary offense was classified as an "environmental violation". Violation tracker also include environmental violations of state agencies, however, EPA is the most comprehensive source of information. Once we collect the violations, we track on a daily basis the environmental violation of all the firms in the sample and we aggregate, in a rolling window of 365 days, the violations of each firm.

- SDC Platinum: we collect information about bond issues and SEOs. In particular,

for bond issues we obtain information about the spread to the treasury bond of reference (in base points) of the bond on the issue date, the maturity, coupon rate, credit rating and amount. With respect to SEOs we collect the issue discount (percentage) of SEOs, measured as the close price at the filling date divided by the offer price minus one. Importantly, for bond issues and SEO we consider the issue date as the key date to link past environmental violations (365 days before the issue date) to debt and equity issuances.

- MSCI ESG: We measure CSR using the MSCI ESG dataset developed by a for-profit company. This data set has a more ample sample coverage (in terms of years and number of companies) than alterantive metrics cavailable in the market, and it has been used most frequently in academic studies (Berg et al., 2022). Considering that MSCI ESG (KLD) ratings (Strengths/Concerns) change over the years, we follow Albuquerque et al. (2019) and normalize the CSR Strengths, CSR Concerns and CSR Score to make them comparable over the years.

- Compustat: we obtain the accounting information to constuct different control variables. For instance, *Size*, *Profitability*, *Tangibility*, *MTB*, *Log(Sales)*, *Cash/TA*, *Div/TA*, *ROA*, *Book Leverage*, *Cash Flow*, *Innovation*, *R&D/TA* and *Firm Age*. Also, we construct as aproxy of financial constraints the Kaplan-Zingales index (see Lamont et al., 2001).

- CRSP: we obtain the stock price information to construct two proxies for asymetric information, stock volume and bid-ask spread.

- IBES: we obtain the analyst coverage of the firms that issue bonds and equity.

Table 1 shows descriptive statistics. The average debt spread in our sample is 216 bps, with a standard deviation of 163 bps. The average issue discount in our sample is 6.8%, with a standard deviation of 14.7%.

2.2 Empirical Model

In the empirical analysis below, we estimate by the following empirical model

$$y_{it} = \beta_0 + \beta_1 1(misconduct_{it}) + \beta_2 ESG_{it} + \Gamma X_{it} + \eta_{ind} + \delta_t + \varepsilon_{it}, \quad (1)$$

where y_{it} is either the debt issuance spread in bps (spread) or the SEO's issuance discount (issue discount) of firm i at year t. The dummy vaiable $1(misconduct_{it})$ takes the value of 1 if the firm has paid a fine by the EPA (Fine paid) or has experienced at least one misconduct event (number of events) within 365 days before the issue date; KLD corresponds to a firm's ESG score, X_{it} is a set of control variables at the security level (for the case of debt) and at the firm level, η_{ind} is a set of 4-digit SIC codes fixed effects, δ_t is a set of year fixed effects, and ε_{it} is random term. All the regressions are estimated with OLS and robust standard errors.

As a robustness test, we present matching estimates using the nearest-neighbor (NN) method with 4 neighbords (Economidou et al., 2023; Derrien et al., 2016). Results are robust to alternative number of neighbords. Similar to Dutordoir et al. (2018), we match treated (fined firms) and non-treated firms using the following firm characteristics: KLD score, size, leverage, book-to-market ratio, and industry SIC code.

3 Pricing effects of environmental misconduct

3.1 Baseline results (OLS with FE)

Table 2 shows our baseline results using an OLS-FE model. Panel A shows the results for issued debt, in which the dependent variable is the debt spread measured in basis points, and panel B shows the results for SEO events, in which the dependent variable is the issue discount calculated as the percentage difference between previous day price and the offer price. A higher debt spread or an issue discount would indicate a market

penalization associated with misconduct. The key dependent variable in our analysis is a dummy variable indicating whether the firm was fined by the EPA due to environmental misconduct during the last year ($1(misconduct)$).

We measure the extent of environmental misconduct in two ways. The first way, capturing the intensive margin, is based on the average fine received by the firm, and the second one, capturing the extensive margin, corresponds to the number of penalties received by a firm in the last year. All the estimated models include time and (4-digit SIC codes) industry fixed effects. We also have as control variables firm size, profitability, tangibility, book-to-market, sales, dividends, ROA, leverage, cash flows, innovation expenses, R&D expenses and age. Last, we control for a firm's CSR engagement using KLD score measures in some especifications.

Panel A shows that in the case of debt issuance, environmental misconduct does not affectaffects the debt spread after a environmental misconducted firms. In the first column, we observe that the estimated coefficient of isconduct is negative (-1.701) but not statistically significant. In the second column, when we control for firm CSR activity, we observe a similar pattern: the estimated coefficient for misconduct is negative (-2.79) and not statistically significant.. Interestingly, the impact of KLD score is negatieve (-46.88) and statisticailly significanrt. This evidence indicates that firm CSR activity is more important than a real misconduct in affecting issued debt spreads. When we use the number of events to build the misconduct dummy, we observe similar results.

Panel B shows the results for SEO. Our results, using the average fine as a misconduct indicator, show that firms fined by the EPA face a higher issue discount on average. The estimated coefficient for the misconduct dummy is positive (3.05) and statistically significant. We find a similar result after controlling for CSR activity, as the misconduct dummy is again positive (2.92) and statistically significant. The effect of the CSR score on issue discount is negative (-4.14) but not statistically significant as in the case of debt spread. When we use the number of events as a misconduct indicator, we find a market penalty

for misconduct firms for issuing equity. The estimated coefficient a positive (3.47) and statistically significant effect in this case.

3.2 Matching Estimation

In this subsection, we consider a matching estimator to deal with endogeneity problems that may bias our previous results. Similar to Dutordoir et al. (2018); Derrien et al. (2016); Economidou et al. (2023), we use a nearest-neighbor matching approach. The matching variables include the CSR score, firm size, leverage, book-to-market, and industry. Table 3 shows our results. Panel A shows the results for debt issuance, and Panel B for SEO. Our results are consistent with previous results. In panel A, we find that after a misconduct a firm faced a higher cost of debt of approximately 20.5 bps for both the case in which misconduct is measured by the average fine paid and the number of events. Considering an average debt spread of aornd 200 bps in our sample, the economic effect of misconduct on the cost of debt is 10% appoximately.

In panel B, we show that environmental misconduct is associated with a higher cost of issuing equity for firms as well. Our matching estimates show an additional issue discount of 8.4%, approximately, for the two measures of misconduct (average fine and number of events). The economic effect on the equity market is significantly higher than the effect on debt markets. Consiring an average issue discount of 6.88%, the estimated effect corresponds to a 120% increase after an environmental misconduct.

4 Probability of issuance after an environmental misconduct

Previous results show that firms receiving a penalty due to environmental misconduct faced higher costs of issuance of new debt and equity, with the cost of the latter being

significantly higher economically than the former. In this section, we assess whether environmental misconduct affects firms' issuance probability.

Table 4 shows the results of estimating a linear probability model. A dummy variable indicating whether a firm issued debt or equity is used as the dependent variable, and the misconduct dummy is the main regressor. We control for firm-level characteristics like size, leverage, and book-to-market as in previous models. Besides, we control for CSR scores and add industry and time fixed effects. In the case of debt, we also include bond-specific characteristics. For debt, we observe that experiencing environmental misconduct has a positive and significant impact of around 15% on the probability of issuing, being this results robust to control for the KLD score. Interestingly, we observe that the CSR scores increase the probability of issuing debt by around 80%. This evidence confirm differential effects between real environmental events and poorly-measured CSR scores.

Panel B shows the estimates of the probability of an SEO. Interestingly, we find the opposit effect of environmental misconduct on the probability of issuing equity than in the case of debt issuance. The estimated coefficients in column (3) is negative (-0.024) and statistically significant. In the specification in which we control for the CSR score, the effect of misconduct on the probability of issuance has similar magnitud (-0.022) and it is statistically significant. The estimated coefficient for the CRS score is negative as well (-0.33) and statistically signficant, indicating that firms involved in CSR activities are less prone to issue equity.

Table 5 shows the probability of issuance estimates using a nearest-neighbor matching estimator. Similar to the exercise in the previous section, we use firm size, leverage, book-to-market, CSR scores, and industry sector as matching variables. For the case of debt issuance, consistent with the linear probability model results, we observe that firms fined due to environmental misconduct are more likely to issue debt than those that do not. The matching estimator shows a higher probability of around 7.9%. For the case of SEO, we observe a lower and statistically significant estimated coefficient of 2.3%.

A possible interpretation of these results is that firms experiencing environmental misconduct perceive that the market will penalize them with a higher cost of debt and equity, as we showed in the previous section; however, they also know that the economic magnitude of these two penalties differs significantly, with the penalty faced in the equity market being considerably higher than the one observed in the debt market. Thus, firms can afford the higher cost of debt, increasing their issuance probability, but not the higher cost of equity, reducing their issuance probabilities. A pecking order story seem to rationalize our results.

5 Heterogeneities

In this subsection, we study cross-sectional heterogeneity effects for polluting/non-polutting firms, financially constrained and opaque firms. For all this features, we split the sample in two (above and below the median in a given year) and reestimate our baseline specification using matching estimators.

5.1 Pollutting industries vs non-pollunting industries

Table 6 shows matching estimates of misconduct on debt spread and SEO discounts for polluting and non-polluting firms, respectively. The 20 most polluting U.S. sectors defined by the two-digit SIC code are 10, 50, 33, 49, 28, 36, 12, 13, 20, 32, 30, 51, 26, 34, 29, 31, 35, 37, 24, and 27. The remaining industries are classified as non-polluting. Panel A shows a differential effect for polluting and non-polluting firms. While we do not find any statistically significant effect for non-polluting firms, we find a 26 bps increase in the debt spread. Panel B shows the opposite results for SEO: in non-polluting industries, we find a more substantial effect in the issue discount than in polluting firms (11.50% vs. 2.38%). These results confirm a certain degree of segmentation in the debt and equity markets.

5.2 Financial constraints

The issuance cost of debt and equity certainly could be different for firms facing financial constraints than those that do not. Therefore, a priori, we could think that our main results reported above about the identified impact of environmental misconduct on the issuance cost may be driven by this limited access to credit rather than a pure misconduct effect. To address this concern in this section, we look at several proxies of a firm's financial constraints and assess the differential impact of misconduct on the cost of debt and equity for firms with low and high financial constraints. As proxies of financial restrictions, we use the stock of cash as a percentage of total assets (cash), the cash flows as a percentage of total assets, the Kaplan-Zingales (KZ) index, and firm age.

Table 7 shows our results. Panel A shows the results for debt spreads. For the case of cash, we find that financially constrained firms are more affected than financially unconstrained firms after environmental misconduct. The estimated impact for financially constrained firms is 27 bps, while for non-constrained firms is 12 bps. We observe similar results when we use cash flows. The estimated effect of misconduct for financially constrained firms is 21 bps, while for non-financially constrained firms is 12bps. We observe even more significant differences when we use the KZ index. The estimated impacts are statistically significant only in the financially constrained firms group, while for the unconstrained group, the effect of misconduct is statistically zero. Finally, when we use firm age, we observe that for the two groups, the estimated impact of misconduct is similar (17 bps vs. 14 bps).

Panel B shows matching estimates for SEO issue discounts. When financial constraints are proxied by the cash stock, we identify an statistically significant effect of misconduct on issue discount only for financially constrained firms. The estimated impact in this case is 3.1%. In the case of cash flows, we find the opposite pattern, in which the more substantial effect is identified for non-financially constrained firms (5.5%), while we find no effect for financially constrained firms. The KZ index shows significant estimated

impacts of 6.4% for financially constrained firms and 3.1% for non-financially constrained ones. Finally, based on firm age, we also find a stronger effect in financially constrained firms (6.6% vs. 4.9%, respectively). Overall, the evidence reported in this subsection indicates that financial constraints play a role in financial and non-financial constrained firms, with a slightly more significant effect for the latter than the former. This evidence rules out the possibility that our results are driven entirely by restrictions on access to credit for firms.

5.3 Information Asymmetries

Information asymmetries play a significant role in debt and equity issuances (citar). Agency problems between lenders and managers may be mitigated by firm information disclosure, reducing the cost of external financing. Thus, identifying a differential effect of environmental misconduct on debt spreads and equity discounts by the level of information asymmetry of the firm is worthy. In this subsection, we perform that analysis using three proxies of information asymmetries: analyst coverage, trading volume, and the bid-ask spread. For example, analyst coverage has been used by Derrien et al. (2016), which shows that a lower coverage implies an increase in the cost of debt of 25 bps. Trading volume and the bid-ask spread has been used as proxies of firm opaqueness in prio literature.

Table 8 shows our results. For the case of debt spread, in panel A, we observe that the effect of misconduct is 20.3 bps for low-coveraged firms and 16.48 bps for high-coveraged firms. Regarding trading volume, we observe that firms with high informational asymmetries are more affected by environmental misconduct as their debt spread is 22.4 bps, compared with 12.9 bps for firms with lower asymmetries. A similar result is found for the bis-ask spread proxy: those firms with high spreads are more sensitive to misconduct than those with low spreads (15.6 bps vs. 13.6 bps, respectively).

Panel B shows estimates for SEO discounts. The results show that information asym-

metries also explain the impact of environmental misconduct on issue discounts: more opaque firms are punished more by investors and face a higher issue discount. Firms with low coverage by analysts face a 9.3% issue discount while those with high coverage a 2.5%. The impact of misconduct for firms with low volume is 5.9%, while the effect for firms with high volume is 3.6%. Finally, when we look at the differential effect of misconduct based on the bid-ask spread, we observe that firms with higher spreads face an equity discount of 24.6% after misconduct, compared with 2.3% for those with lower spreads.

Finally, it is worth mentioning that prior studies have also used firm age as a proxy of the firm informational level. In the previous section, we report results for young and old firms and find consistent results for debt and equity issuances. Overall, we find consistent evidence that information asymmetries affect the cost of external financing for firms fined for environmental misconduct.

6 Conclusions

In this paper, we investigate the impact of corporate environmental misconduct on the cost of debt and equity (SEO) issuance. Using a sample of U.S. firms fined by the Environmental Protection Agency (EPA), we find that firms face higher debt spreads and higher discount prices when issuing debt and equity, respectively. Economically, while the increase in the cost of debt corresponds to around 10%, the cost of equity increases by 120%. We also find that corporate environmental misconduct increases the probability of issuing debt and reduces the probability of SEO. A possible explanation for these results is that firms, aware of the issuance costs of environmental misconduct, can afford them for the case of debt issuance but not for the much higher price of equity issuance.

We also find that the main effect of misconduct on debt spread is stronger in polluting industries, while the effect on issue discount is stronger in non-polluting firms. Finally,

cross-sectional tests show a differential effect of misconduct on debt and equity discounts for financially constrained and opaque firms.

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Table 1: **Summary Statistics**

This table reports descriptive statistics for the sample of bond issues and seasoned equity offerings.

	Bond Sample						SEO Sample					
	N	*Mean*	*Std*	P25	Median	P75	*N*	*Mean*	*Std*	P25	Median	P75
Spread (bps)	4281	216.8	163.3	95	160	300						
Bond-1($misconduct_{it}$)	4281	0.239	0.426	0	0	0						
Debt Proceedings	4281	489.6	457.6	225	375	600						
Debt Maturity	4281	5.769	2.289	4.121	5.875	7.300						
Coupon rate (%)	4281	10.194	7.007	7.014	10.008	10.047						
YTM(%)	4281	5.803	2.297	4.125	5.875	7.375						
Moodys Rating	4281	12.718	3.582	10	13	15						
ESG	2465	0.019	0.07	-0.026	0.000	0.048	2184	-0.009	0.038	-0.028	0	0
Issue Discount							6713	6.887	14.674	0.695	5.962	13.636
SEO-1($misconduct_{it}$)							6713	0.037	0.189	0	0	0
Size	4281	8.878	1.362	7.923	8.942	9.947	6713	5.553	2.041	4.143	5.383	6.985
Profitability	4281	0.143	0.08	0.097	0.137	0.181	6713	-0.093	0.637	-0.144	0.086	0.145
Tangibility	4281	0.396	0.264	0.163	0.361	0.605	6713	0.287	0.271	0.065	0.181	0.463
MTB	4281	1.526	0.998	0.891	1.217	1.841	6713	2.72	4.611	1.013	1.592	2.904
Log(Sales)	4281	8.577	1.435	7.659	8.719	9.607	6713	4.801	2.608	3.262	4.982	6.609
Cash to Assets	4281	0.068	0.087	0.014	0.036	0.090	6713	0.253	0.29	0.027	0.115	0.421
Dividends to Assets	4281	0.022	0.026	0.003	0.014	0.029	6713	0.007	0.024	0	0	0.001
ROA	4281	0.052	0.07	0.025	0.051	0.084	6713	-0.195	0.778	-0.213	0.012	0.053
Leverage	4281	0.343	0.175	0.229	0.326	0.430	6713	0.292	0.366	0.038	0.241	0.428
Cash Flow to Assets	4281	0.095	0.071	0.060	0.093	0.129	6713	-0.151	0.768	-0.173	0.048	0.098
Innovation	4281	0.185	0.201	0.014	0.109	0.303	6713	0.138	0.201	0	0.025	0.219
R&D to Assets	4281	0.013	0.029	0.000	0.000	0.015	6713	0.115	0.214	0	0.003	0.14
Age	4281	33.393	18.214	17	35	50	6713	12.188	13.268	3	7	17

Table 2: **Pricing effects of environmental misconduct (Baseline OLS-FE)**

This table presents estimates of the following equation

$$y_{it} = \beta_0 + \beta_1 1(misconduct_{it}) + \beta_2 ESG_{it} + \Gamma X_{it} + \eta_{ind} + \delta_t + \varepsilon_{it},$$

where y_{it} is either the debt issuance spread in bps (Spread) or the SEO's issuance discount (issue discount) of firm i at year t; $1(misconduct_{it})$ is a dummy variable taking the value of 1 if the firm has paid a misconduct fine in the last year (Panel A) or has experienced at least one misconduct event (Panel B); KLD corresponds to a firm's ESG score, X_{it} is a set of control variables at the security level and at the firm level, η_{ind} is a set of 4-digit SIC codes fixed effects, δ_t is a set of year fixed effects, and ε_{it} is random term. All the regressions are estimated with OLS and robust standard errors.

Panel A: Debt (Spread, bp)				
	Fine Paid		*Number of Events*	
$1(misconduct)$	-1.701	-2.799	-1.847	-3.039
	(2.373)	(2.983)	(2.377)	(2.990)
KLD score		-46.88**		-46.96**
		(22.46)		(22.46)
Obs.	4,241	2,423	4,241	2,423
R^2	0.903	0.898	0.903	0.898
Panel B: SEO (Issue Discount,%)				
	Fine Paid		*Number of Events*	
$1(misconduct)$	3.502***	2.919***	3.479***	2.902***
	(0.694)	(0.771)	(0.691)	(0.767)
KLD score		-4.141		-4.133
		(6.271)		(6.270)
Obs.	6,680	2,137	6,680	2,137
R^2	0.126	0.229	0.126	0.229

Table 3: **Pricing effects of environmental misconduct (Matching estimator)**

This table presents matching estimates of the impact firm environmetal misconduct on firm's debt issuance spread (Spread) or SEO's issuance discount. The treated group are firms issuing (debt or equity) after an environmetal misconduct, while the control group are issuing firms that have not experience environmental misconduct. $1(misconduct_{it})$ is a dummy variable that take the value of 1 if the firm has paid a misconduct fine in the last year (Panel A) or has experienced at least one misconduct event (Panel B). We obtained matching estimates using a nearest-neighbor (NN) estimator, and as matching firm charasteristics, we considered firm size, firm leverage, firm book-to-market ratio, and firm industry SIC code.

Panel A: Debt (Spread, bp)		
	Fine Paid	*Number of Events*
$1(misconduct)$	20.57***	20.58***
	(3.985)	(3.982)
Obs.	4,340	4,340
Panel B: SEO (Issue Discount,%)		
	Fine Paid	*Number of Events*
$1(misconduct)$	8.439***	8.455***
	(2.095)	(2.095)
Obs.	7,336	7,336

Table 4: **Probability of Issuance (OLS-FE)**

This table presents estimates of the probability of issuance of debt (panel A) and equity (SEO) (panel B) using a linear probability model. $1(misconduct_{it})$ is a dummy variable that take the value of 1 if the firm has experienced at least one environmental misconduct event. KLD corresponds to a firm's ESG score. Control variables include firm size, firm leverage, and firm book-to-market ratio. Estimates include industry (SIC code) and year fixed effects.

	(1)	(2)	(4)	(5)
	Panel A: Debt Issuance		**Panel B: SEO**	
$1(misconduct)$	0.153***	0.147***	-0.0248***	-0.0224***
	(0.00960)	(0.00956)	(0.00566)	(0.00566)
KLD score		0.815***		-0.338***
		(0.0590)		(0.0312)
Obs.	26,163	26,163	26,163	26,163
R^2	0.121	0.133	0.062	0.065
Control Var.	YES	YES	YES	YES
Industry FE	YES	YES	YES	YES
Year FE	YES	YES	YES	YES

Table 5: **Probability of Issuance (Matching Estimator)**

This table presents estimates of the probability of issuance of debt and equity (SEO) using nearest-neighbor (NN) matching estimator. We match using the following firm characteristics: KLD score, size, leverage, book-to-market ratio, and industry SIC code.

	(1)	(2)
	Debt Issuance	**SEO**
$1(misconduct)$	0.0796***	-0.0232***
	(0.0115)	(0.00582)
Obs.	25,095	25,095

Table 6: **Heterogeneity: Polluting industries**

This table presents matching estimates of the impact firm environmetal misconduct on firm's debt issuance spread (Spread) or SEO's issuance discount. The treated group are firms issuing (debt or equity) after an environmetal misconduct, while the control group are issuing firms that have not experience environmental misconduct. $1(misconduct_{it})$ is a dummy variable that take the value of 1 if the firm has paid a misconduct fine in the last year (Panel A) or has experienced at least one misconduct event (Panel B). We obtained matching estimates using a nearest-neighbor (NN) estimator, and as matching firm charasteristics, we considered firm size, firm leverage, firm book-to-market ratio, and firm industry SIC code. Polluting firms are those in sectors defined by the two-digit SIC codes 10, 50, 33, 49, 28, 36, 12, 13, 20, 32, 30, 51, 26, 34, 29, 31, 35, 37, 24, and 27. The remaining industries are classified as non-polluting.

Panel A: Debt (Spread, bp)		
	Non-polluting	Polluting
$1(misconduct)$	-5.460	26.78***
	(5.568)	(4.701)
Obs.	1,814	2,467
Panel B: SEO (Issue Discount,%)		
	Non-polluting	Polluting
$1(misconduct)$	11.50***	2.380**
	(2.197)	(0.945)
Obs.	2,772	3,941

Table 7: **Heterogeneity: Financial Constraints**

This table presents matching estimates of the impact firm environmetal misconduct on firm's debt issuance spread (Spread) or SEO's issuance discount. The treated group are firms issuing (debt or equity) after an environmetal misconduct, while the control group are issuing firms that have not experience environmental misconduct. $1(misconduct_{it})$ is a dummy variable that take the value of 1 if the firm has paid a misconduct fine in the last year (Panel A) or has experienced at least one misconduct event (Panel B). We obtained matching estimates using a nearest-neighbor (NN) estimator, and as matching firm charasteristics, we considered firm size, firm leverage, firm book-to-market ratio, and firm industry SIC code. We define financially constrained firms (FC) as those with cash, cash flows and age below the median, respetively, or with a KZ index above the median.

Panel A: Debt (Spread, bp)								
	Cash (Stock)		Cash Flows		KZ Index		Age	
	FC	Non FC	FC	Non FC	FC	Non FC	FC	Non FC
$1(misconduct)$	26.78***	11.87**	20.83***	12.38***	30.58***	0.961	16.81***	13.59***
	(6.045)	(5.071)	(5.536)	(4.477)	(5.707)	(4.575)	(6.104)	(4.668)
Obs.	1,895	2,386	1,956	2,325	2,101	2,161	2,156	2,125
Panel B: SEO (Issue Discount,%)								
	Cash		Cash Flows		KZ Index		Age	
	FC	Non FC	FC	Non FC	FC	Non FC	FC	Non FC
$1(misconduct)$	3.087***	-5.770	-2.086	5.491***	6.427***	3.052***	6.615***	4.985***
	(0.931)	(5.618)	(2.610)	(1.059)	(1.234)	(1.075)	(0.906)	(1.134)
Obs.	3,573	3,140	3,149	3,564	3,392	3,292	3,273	3,440

Table 8: **Heterogeneity: Information Asymmetries**

This table presents matching estimates of the impact firm environmetal misconduct on firm's debt issuance spread (Spread) or SEO's issuance discount. The treated group are firms issuing (debt or equity) after an environmetal misconduct, while the control group are issuing firms that have not experience environmental misconduct. $1(misconduct_{it})$ is a dummy variable that take the value of 1 if the firm has paid a misconduct fine in the last year (Panel A) or has experienced at least one misconduct event (Panel B). We obtained matching estimates using a nearest-neighbor (NN) estimator, and as matching firm charasteristics, we considered firm size, firm leverage, firm book-to-market ratio, and firm industry SIC code. We define as more opaque firms those with low analyst covarage, low volume, and high bid-ask spread.

Panel A: Debt (Spread, bp)						
	Analysts Coverage		Volume		Bid-Ask Spread	
	Low	High	Low	High	Low	High
$1(misconduct)$	20.32**	16.48***	22.40***	12.85***	15.56**	13.57***
	(8.154)	(5.714)	(7.235)	(4.307)	(7.164)	(3.444)
Obs.	1,607	1,497	2,113	2,096	2,001	2,036
Panel B: SEO (Issue Discount,%)						
	Analysts Coverage		Volume		Bid-Ask Spread	
	Low	High	Low	High	Low	High
$1(misconduct)$	9.325***	2.536***	5.974**	3.630***	24.64***	2.266**
	(2.683)	(0.836)	(2.964)	(0.711)	(2.878)	(0.880)
Obs.	2,457	2,136	3,137	3,251	2,967	3,220