Involuntary Disclosures through Climate Litigations: Impact on Investors and Corporate Policies

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ABSTRACT

I study the role of involuntary disclosures in steering environmental governance. Using a sample of climate litigations filed between 2012 and 2019, I examine whether these litigations shed new light on defendant firms' climate risks, and whether this information is relevant enough to trigger investors' reactions and impact corporate policies. I find that on average climate litigations have no significant effect on firm value or on emissions, and do not lead to divestments by green institutional investors. However, cases that attract investors' attention do lead to significant reductions in emissions for the defendant firms. In contrast, I find little evidence that climate litigations contribute to self-disciplining effects on non-targeted peer companies.

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1 Introduction

Demand from investors and a broader array of stakeholders for climate-related information is growing. Testament to this is the increase in voluntary climate risk disclosures by firms (Ilhan et al., 2023) and in initiatives such as the Task Force on Climate-related Financial Disclosure (TCFD), aiming at obtaining harmonized and accurate information on the physical and transition risks firms are exposed to.

Climate disclosures are critical to the distribution of climate-related information, and consequently to investors' beliefs formation (Ilhan et al., 2023), and informed decision-making (Bolton and Kacperczyk, 2021). Access to such information is also crucial for the effective pricing of externalities and in guidance to policy-makers in the formulation of regulations (Lemoine, 2022).

However, to this date, only a limited fraction of the economy has voluntarily disclosed climate-related information (CDP, 2022), suggesting it is associated with some benefits and costs (Admati and Pfleiderer, 2000). In particular, firms may use voluntary climate disclosures to signal their greenness and attract a lower cost of capital (Bolton and Kacperczyk, 2021), but disclosing relevant information may also be costly if it forces firms to reveal elements regarding their long-term strategy (Ilhan et al., 2023) or the extent to which their business model still relies on carbon-intensive activities or assets.

In this paper, I examine a new source of information that originates from involuntary disclosures. This type of disclosure, provided that it emanates from credible and well-versed third parties, could represent a valuable source of information to investors and stakeholders, allowing them to acquire new evidence that companies are unwilling to disclose. In contrast to mandatory disclosures that may not be able to draw specific standards for each firm or sector (Admati and Pfleiderer, 2000), involuntary disclosures may also unveil information tailored to a particular company or sector.

Focusing on a type of involuntary disclosure that firms are increasingly faced with, namely climate litigations, I study whether and to what extent investors, targeted companies, and their peers react to this type of disclosure. These litigations are typically initiated by NGOs or stakeholder groups with the intent of stimulating climate action.

Their incidence is on the rise globally, with a marked increase in North America and Europe, primarily targeting major carbon emitters in the Oil, Gas, and Utilities sectors. However, firms across various industries are also finding themselves increasingly at risk for this type of legal action (Setzer and Higham, 2022).

Another distinctive feature of climate litigations is that they represent a heterogeneous set of lawsuits, with various legal arguments, strategies, and publicity associated. Using existing laws and regulations, sometimes in a creative way, claimants build cases that have different levels of substance and, consequently, varying levels of additional information. While some of the litigations may appear to lean on the frivolous side, others may instead allow unmasking relevant climate risks including some that may be missing or unclear from other sources of climate disclosures, such as ESG ratings (Edmans et al., 2016; Berg et al., 2022). In addition, unlike voluntary disclosures that are shaped by a firm's strategic choices, disclosures instigated by third parties may offer a more comprehensive source of information that can also be tailored to address some unique features of a particular firm or sector (Admati and Pfleiderer, 2000). Climate litigations thus provide an ideal setting to understand the effects on companies and investors of involuntary disclosures, while allowing to examine some of the economic mechanisms through which they can be effective.

I focus on climate litigations filed in the U.S. between 2012 and 2019 that target publicly listed companies, and use data from the Sabin Center for Climate Change Law, at the Columbia University Law School, which identifies cases based on whether "climate change" is a central aspect of the legal argument. My sample includes 48 climate litigations targeting 118 distinct public companies. Although the number of these cases remains limited, their importance should not be belittled given that the defendant firms -and their peers- are major carbon emitters. In addition, these lawsuits represent an important example of how private politics are taking center stage in fighting climate change (Daubanes and Rochet, 2019). Unlike other mechanisms designed to promote corporate climate action, and unlike other types of involuntary disclosures (e.g. short-sellers), they are also not purely based on market incentives and mechanisms. Instead, they are partly based on public action, and more precisely on courts which, in the U.S., play an important role

in shaping climate regulations (Novak, 2020; Totenberg, 2022), and may also contribute to reinvigorating regulatory efforts when climate concerns do not top the government's agenda.

First, I evaluate the information content and investors' disagreement in response to involuntary disclosures triggered by climate litigations. I consider two possible channels for involuntary disclosures to spur investor reaction and disagreement. On the one hand, climate litigations could lead to the revelation of some additional information about a firm's climate risk exposure ("information" channel). Such information would allow investors to update their expectations on defendant firms' exposure and management of climate risks (Flammer et al., 2021; Krueger et al., 2019). On the other hand, claimants could raise investors' attention to a specific firm by bringing it to court ("attention" channel). The mere stigmatization of the targeted firms would put pressure on those companies, similarly to how divestment pledges operate (Becht et al., 2023). In turn, greater (negative) investor attention would lead to more severe damages to corporate reputation and firm value (Abdulmanova et al., 2021). To assess the impact of each of these channels, I examine defendant firms' Cumulative Abnormal Returns (CARs) and Cumulative Abnormal Volumes (CAVs) in the [-2,+2] days around a climate litigation filing date.

I obtain that there is on average no firm value effect associated with the filing of a climate litigation. Average CARs hover at around 0.35% and are not statistically significant at any confidence level during the 2012 to 2019 period. However, as most cases are still pending (Figure B.5), data regarding whether fines have resulted from these litigations is still limited. As a consequence, and while there exists some preliminary evidence that most of these lawsuits are either lost by the claimants (Sato et al., 2023) or lead to minimal fines for the defendants (Solana, 2020), I cannot rule out that part of the observed losses may also be explained by the expected size of the legal penalties imposed on the firm (Karpoff et al., 2005).

However, I proceed to examine some of the determinants of the magnitude of CARs, and explore the impact of investor attention, as measured by abnormal search volume

for a defendant's stock ticker on Google (Da et al., 2011), vis-a-vis the impact of the information content of the involuntary disclosures. I obtain that filings whose complaints feature a longer factual allegations part, which I interpret as containing more substantial information, are associated with more negative CARs. The attention component plays a part as defendant firms with more searches on their ticker at the time of a litigation filing get stronger negative firm value reactions. I also find that the existing information environment matters, as firms that have previously disclosed their physical climate risks tend to suffer less severely negative firm value reactions. Finally, it appears that there is a marked political dimension to these reactions: filings during Republican administrations tend to elicit less negative responses, possibly reflecting perceptions of a more lenient regulatory environment.

Moreover, I examine whether, similarly to other types of climate-related disclosures, involuntary disclosures generate some investor disagreement. Although I find no significant abnormal trading volumes associated with the filing of climate litigations, with CAVs averaging around -0.05, I obtain that the nature of pre-existing disclosures does influence the market reaction. Specifically, a higher level of prior legal risk disclosures is linked to greater investor disagreement in further involuntary disclosures, in line with findings from voluntary climate risk disclosures (Cohen et al., 2021). Conversely, I find that pre-litigation non-legal risk disclosures correlate with smaller abnormal volumes at the time of litigation filing.

I also provide evidence regarding the reaction of institutional investors to involuntary disclosures. The institutional investors' channel is considered a powerful mechanism in incentivizing companies to increase disclosures and reduce climate risk exposures (Krueger et al., 2019; Stroebel and Wurgler, 2021). These investors represent a category of sophisticated investors, equipped with a more comprehensive view of risks faced by portfolio firms, as well as a growing concern for climate risks and demanding more disclosure on the topic (Krueger et al., 2019). In this context, I hypothesize that institutional investors have a high potential to learn from and act upon involuntary disclosures if new information about climate risks stems from these disclosures.

I obtain that climate litigations generally do not lead to significant changes in own-

ership among "green" institutional investors, such as UNPRI Signatories or those with higher levels of E-tilt and Active Share (both defined following Pastor et al. (2023)). However, when firms face negative Cumulative Abnormal Returns (CAR[-2,2]<0) around the litigation filing date, I uncover a significant increase in ownership by UNPRI signatories for the defendant firms, while overall ownership by UNPRI signatories decreases across both defendant and control firms. This increase in ownership is mostly observed among UNPRI signatories who possess a combination of low E-tilt and high Active Share. In a future version of the paper, I plan to study whether these institutional investors subsequently choose to engage more climate issues with the portfolio companies, instead of divesting from them, as Krueger et al. (2019) indicate that the engagement channel is the approach preferred by institutional investors.

I further examine the conditions under which climate litigations represent an effective external governance tool, as opposed to a costly distraction leading to a depletion of resources for the firms and the NGOs involved. The alternative hypotheses of "pressure" versus "disciplining", tested in the case of shareholder class-action litigations (Arena and Julio, 2015), are also helpful here, as they are directly linked to the claimants' stated objectives. In particular, corporate litigations could backfire if the defendant firms are also those that are most effective in developing innovations to reduce carbon emissions (Cohen et al., 2021), or if they trigger corporate policies such as polluting asset sales that do not lead to aggregate emission reductions (Duchin et al., 2022).

First, I examine the determinants of the likelihood of a firm becoming a defendant in a climate litigation. I find that firms are faced with an increasing probability of becoming defendants, indicating a growing trend for this type of litigation, but also that claimants are being fully strategic in their selection of target companies (Peel and Markey-Towler, 2021). Specifically, and while there may also be some unobservable factors at play, I find that firms with higher Scope 1 Emissions levels, especially within the Energy sector, are particularly at risk. Interestingly, firms with high carbon intensities or cash reserves are not more commonly selected as targets. In contrast, companies that fail to disclose physical climate risks tend to be more frequently involved as first-time defendants in

climate litigations, suggesting that a lack of transparency in climate reporting may also increase litigation risk.

Second, I test whether the onset of a climate litigation induces defendant firms to abate their emissions. From my results, it appears that, while defendant firms generally do not alter emissions in the aftermath of these lawsuits, litigations that negatively impact defendant firms' market value are also associated with a decrease in emissions. Specifically, firms experiencing a negative CAR in the two-day window of a litigation filing demonstrate significant reductions in Scope 1 Emissions, with an average reduction of 2.7 million tons of CO2e. I also find that these emissions reductions primarily arise from decreased participation in polluting activities within the U.S., not from a decrease in the carbon intensity of their activities.

Turning to climate risk disclosures, I find no evidence of an increase in the probability for defendant firms to voluntarily disclose their climate risk exposure following the onset of a climate litigation. The absence of increased disclosure is consistent across cases, i.e. regardless of whether defendant firms experience negative financial consequences from the litigation.

Finally, I shed light on the peer-level effects of climate litigations. Specifically, I explore whether climate litigations can influence firms that are not directly involved, but closely resemble a defendant firm. The rapid growth of stakeholder activism over the past decade has brought attention to the social legitimacy of such activism and its efficacy in promoting industrial transparency (Daubanes and Rochet, 2019) by compelling firms to engage in self-regulation to mitigate the risk of potentially more stringent regulatory intervention (Maxwell et al., 2000), or of becoming a defendant in a climate litigation.

I first analyze the impact of climate litigations on the direct emissions of peer firms. I find no significant effect on the emissions of these firms, except for the closest neighbor in cases that have resulted in negative abnormal returns for the defendant. In these specific instances, there is a significant decrease in emissions for the first peer firm, amounting to 2.2 million tons of CO2e, while I uncover no significant changes in Scope 1 Emissions and Intensity among the further peer firms.

Turning again to disclosures, the results are quite different, especially regarding

legal, market, and reputation risk disclosures. Following the filing of cases with negative Cumulative Abnormal Returns (CAR[-2,2]<0), I observe a significant increase in the likelihood that peer firms will disclose their climate risks. This increase is particularly pronounced for legal risks and is consistent across all types of neighboring firms examined. Additionally, there is also an observed increase in the likelihood of disclosing physical risk exposure. However, I find that this is restricted to the closest neighbors of firms that experienced negative CAR around the time of the litigation.

Overall my paper provides evidence on a new complementary type of disclosure: involuntary disclosures stemming from climate litigations. In a contemporary descriptive study, Sato et al. (2023) find that climate litigations attract on average negative CARs, both at the time of the filing and during events associated with the judicial proceedings. Instead, I examine stock market reactions to climate litigation in light of the broader context of firms' reaction to involuntary disclosure of information.

My paper also contributes to the understanding of the corporate and governance impacts of climate litigations, intended as a formal type of private politics. I characterize the main economic mechanism underlying climate change litigations and the conditions that determine their ability to induce environmentally friendly changes within targeted firms. From my results, it appears that only a subset of climate litigation cases significantly influences both firm value and carbon emissions. In addition, emission reductions primarily result from the transfer of emitting assets rather than from abatements. Finally, I find that while the self-regulatory effects on emissions do not extend beyond the targeted firms, peer firms do tend to increase their voluntary climate risk disclosures following the onset of a climate litigation. Taken together, these results provide evidence of the role of climate litigations in helping to amass new and pertinent information on defendants' climate risk exposures but also raise doubts about whether such litigations can serve as a complementary approach to carbon regulation.

2 Institutional Details and Literature Review

2.1 Traditional sources of climate-related information

Investors face several sources of climate-related information, each associated with specific challenges.

Voluntary Disclosures Voluntary disclosures are directly and strategically managed by firms, which select the information and narrative they wish to emphasize. This decision-making process includes a cost-benefit analysis where the potential benefits, such as a reduction in capital costs or an enhancement of liquidity, must be weighed against the risks of exposing sensitive proprietary information (Ilhan et al., 2023). In practice, these disclosures may be presented through Corporate Social Responsibility (CSR) reports. A significant limitation of these reports is the absence of standardized practices, which results in considerable variability in the substance, reliability, and format of the disclosed information. Alternatively, firms may respond to the Carbon Disclosure Project (CDP) questionnaire, which offers a more structured and standardized format but incurs higher preparation and verification costs (Banerjee et al., 2023). Consequently, only a subset of firms chooses to engage with CDP (CDP, 2022).

Mandatory Disclosures Regulatory bodies have recognized the necessity for standardized and robust climate-related reporting, and are currently elaborating rules intended to cover a broader range of firms. In the United States, a notable development is the proposed Securities and Exchange Commission (SEC) rule requiring the inclusion of climate-related information in periodic filings, with a particular focus on the financial implications of climate risks and opportunities. Although still facing legal challenges, this regulation aims to establish a uniform methodology founded on materiality[1]. However, an important limitation of such frameworks is their inability to be fully tailored to each specific firm or sector.

[1]Similar regulatory efforts are observed in California and the European Union, but in contrast to the SEC rule, the California and EU frameworks tend to emphasize a broader scope of sustainability reporting, including more comprehensive GHG emissions data and broader environmental impact metrics.

ESG Ratings ESG ratings alleviate some of the issues related to data availability and comparability prevalent in other types of disclosures. While they represent an important source of information for investors, these ratings are also criticized for their opaque methodologies (Berg et al., 2022) and the potential conflicts of interest arising from their business model (Agrawal et al., 2023).

2.2 Climate litigations as a source of relevant information

In this context, I argue that another type of disclosures, namely involuntary disclosures, allows to fill some gaps by providing additional climate-related information to investors. I focus in particular on climate litigations, which are broadly defined as legal actions initiated to promote efforts toward climate change mitigation and, in some instances, adaptation. While these litigations are diverse, drawing upon various legal foundations and strategies (as detailed in Appendix), a pivotal aspect of these cases is that they include an effort by claimants to compile sufficient evidence to overcome the "hurdle of proof" required by the court.

To achieve this, claimants must construct a solid legal complaint that effectively marshals relevant facts to support their claims. The relevance of these facts about established legal doctrines is crucial; however, the quality of the evidence presented is equally critical. In addition, it may allow, as a by-product, to bring new information to investors.

2.3 Related Literature

Firstly, my paper is related to the literature that investigates how more high-quality information regarding both how firms are exposed to climate risks and how they manage those risks, can be gathered by investors to make informed decisions. While climate risks increasingly factor into firms' portfolio allocations (Krueger et al., 2019), information regarding those risks remains incomplete, and imperfect (Ilhan et al., 2023). In addition, until the new SEC rule is approved, disclosure efforts in the U.S. remain primarily voluntary. The supply of disclosure thus largely depends on firms' efforts and in particular on the firm's costs and benefits of such disclosures (Ilhan et al., 2023). This seems particularly problematic for high-polluting entities, which face higher costs associated with

disclosures, but for which externality benefits are also more pronounced. It is thus critical to examine how greater high-quality climate risks disclosure by firms can be induced. Flammer et al. (2021) show that, in the absence of mandatory disclosure, private governance efforts, namely environmental proposals put forth by activist shareholders, have the potential to induce firms to divulge more information regarding their climate risks. The authors also show that this type of disclosure leads to higher valuations. I contribute to this literature by studying whether litigations can act similarly as an involuntary climate risks disclosure, bringing high-quality and relevant information regarding some of the climate risks a firm is exposed to and whether investors value this type of information.

My paper is also related to the theoretical literature examining the role of private politics in shaping firms' policy. Maxwell et al. (2000) show that firms may have incentives to "self-regulate" in order to preempt regulation inspired by activists. Also close to my setting is the model developed by Daubanes and Rochet (2019), where activists can directly interact with the firm, instead of having to pressure the regulator. Precisely, they study the role of NGO activism in affecting firm practices, and under which conditions this type of action improves social welfare. They find that NGOs can reduce the propensity of firms to undertake polluting projects by forcing a firm to renounce a project, even though the regulator has approved it. In addition, the presence of NGO activists leads firms to self-regulate by abandoning their most harmful projects. I contribute to this literature by providing the first empirical examination of this theory.

Finally, the role of corporate litigations, such as securities class actions, as external governance instruments, has been extensively studied. The two main opposing hypotheses are that shareholder litigations have either a (i) "disciplining" effect: the threat of litigation helps to ensure that managers fulfill their fiduciary duties; (ii) or a "pressure" effect, imposing excessive short-term pressures on the management team and intensifying capital market concerns. Arena and Julio (2015) show that an increase in shareholder litigation risks affects corporate financial policies and in particular leads to an increase in the cash-to-asset ratio and a reduction in capital expenditures. Lin et al. (2020) show that

the adoption of universal demand laws, which reduced the risk for this type of litigation, has led to an increase in R&D investment. I contribute to this literature by exploring which of the two effects dominates in the case of climate litigations. This seems particularly important as, if the "pressure" short-term effect dominates, it would contradict the litigants' intended goals, which is to achieve socially beneficial and lasting effects, even beyond the particular firms and case at hand.

3 Data and Descriptive Statistics

3.1 Data Sources

Climate litigations data I use litigation data from the Sabin Center for Climate Change Law, at the Columbia University Law School. Their data collection process involves one principal criterion for a case to be included, namely that "climate change law, policy or science" must be a material issue of law or fact. In contrast, cases that make only a passing reference to climate change, but do not address climate-relevant laws, policies, or actions are not included. Also not included in the database are cases that may have a direct impact on climate change, but do not explicitly raise climate issues, such as challenges to government inaction on local air pollution based on other types of harm to human health. Another important criterion is that cases must be brought in front of a judicial body, which excludes any legal threat not brought up to court. It explains the relatively small number of cases but also ensures the possibility of a judicial ruling. In addition, my dataset includes some but few EPA enforcement cases (Figure B.3).

Corporations can be involved in climate litigations as either claimants or defendants. However, as detailed by the Sabin Center, the data collection process involves some input from pro-environmental litigants, which leaves cases in favor of more ambitious climate change actions more likely to be represented, compared to cases with the objective to limit further restrictive rules on emissions. Taking note of this limitation, I focus on cases in which corporations act as defendants.

Finally, I focus on their U.S. database and retrieve, for each case, information regarding the claimant, the defendant(s), and the filing date of each case. I restrict my

sample to cases filed after 2012 as both efforts and attention have leveled up in recent years. I thus exclude seminal but unsuccessful cases, such as *Comer vs. Murphy Oil (2005)*, and *Kivalina vs. Exxon (2008)*.

Firm-level data I identify cases involving a public company and match them with firm-level data from *Compustat*, as well as some security prices and volume data from the *Compustat Securities Daily* dataset.

In addition, I use emissions data from *Trucost*, which contains firm-level information on Scope 1 (direct) and Scope 2 (indirect) emissions. From the *Carbon Disclosure Project* (CDP), I obtain carbon disclosure data, which is compiled through (voluntary) responses of firms to an annual survey. I use facility-level data provided by the *Environmental Protection Agency* (EPA), which, since 2010, requires all U.S. facilities that emit above 25,000 metric tons of CO2e of GHGs to report their direct emissions as well as some information on the owner(s) of the facility, which I match to firm-level data. I also use patent data and the matching from Kogan et al. (2017), which is restricted to CRSP companies[2]. Among those patents, I identify "green" ones using the same methodology as Dalla Fontana and Nanda (2023) and based on CPC classification[3]. Finally, I use data on quarterly institutional (13f) holdings from *Thomson/Refinitiv* (S34).

3.2 Descriptive Statistics

The sample comprises all cases filed in the U.S. against public corporations between 2012 and 2019, for a total number of 48 distinct cases (Table 1). As claimants frequently bring a single suit against many defendants, the total number of firms sued is higher, at 118. It can also be that a firm becomes defendant in multiple climate litigations within a year, thus the number of firm-years sued drops to 64. In order to be able to observe changes in firm-level outcomes several years after the filing date, I exclude cases filed after 2019. However, it is worth noting that since 2020, there has been a continuous increase in the

[2]I use data released on May 10, 2023, which includes all patents issued until the end of 2022.

[3]Precisely, I classify a patent as green if its CPC classification is Y02, which identifies environmental technologies.

Panel A: Distribution of Filing Years

	2012 ≤ Filing Year < 2020	Filing Year ≥ 2020	Filing Year < 2012
Number of cases	**48**	28	8
Number of firms sued	**118**	99	8
Number of firm-year sued	**64**	44	8

Panel B: Type of Action

Civil Lawsuit	Criminal Lawsuit	Regulatory Action	Total
40	2	6	48

Panel C: Party Bringing the Action

Individual or NGO	Local Government	State Attorney General	EPA	Corporation	Trade Association	Total
19	18	2	5	3	1	48

Table 1: Climate litigations sample. Distribution of climate litigation cases identified using the Sabin Center Climate Litigations database. Panel A partitions the events by filing year. Panel B partitions the events by the type of action initiated by the plaintiff. Panel C separates the events by the party bringing the action.

number of climate litigations (Table 1, Panel A).

Climate litigations represent a heterogeneous set of lawsuits. There exists some variation in the level of efforts made by the claimants to substantiate their claims, as measured by the length of the "Factual Allegations" part of the complaint, in which they bring evidence against the defendant (Figure B.7). In addition, claimants use a wide range of legal grounds. However, a majority of the cases in the sample are based on "Public Nuisance" claims, i.e. focusing on activities or practices that allegedly endanger the life, health, property, morals, or comfort of the public or obstruct the public in the exercise or enjoyment of rights common to all (Figure B.6).

Table B.1 reports summary statistics of the entire sample of firms. In addition, I examine the factors that influence a firm's likelihood of facing climate litigation, by estimating the following linear probability model:

$$\mathbb{1}[\text{Became defendant in a climate litigation}]_{ft} = \alpha X_1 + \beta X_{2t} + \epsilon_{ft},$$

for each firm f and year t.

Table 2 indicates a growing trend in the frequency of climate litigations and documents a significant positive correlation between higher emissions, especially Scope 1 emissions, and the likelihood of facing a climate lawsuit. Interestingly, higher emissions intensity appears to mitigate the probability of such legal challenges. In addition, energy firms, even when controlling for emissions levels, are more frequently the targets of litigation. This suggests that claimants are strategically focusing their legal efforts on entities with high emission levels within this sector, a tactic that likely reflects both the visibility and environmental impact of these firms. As a consequence, such firms often repeatedly face climate lawsuits over time, suggesting sustained legal pressure.

In columns 2 to 4, I introduce some controls for prior climate disclosures, as well as some sector-year and country-year fixed effects. I find that firms that do not disclose physical risks face a higher risk of becoming first-time defendants in a climate litigation. This finding suggests that the strategic approach taken by claimants could also be to target firms that underestimate or under-report their exposure to climate risks.

4 Do Investors Learn about Climate Risks through Involuntary Disclosures?

4.1 Stock market reaction

Using an event study analysis, I evaluate to what extent and under which conditions climate litigations represent a significant financial risk. I also test whether climate litigations include the two components of disclosures: information and attention. Finally, using abnormal trading volume, I investigate whether such legal actions induce investor disagreement, to assess whether there is some variation in the market's perception of the relevance of the information introduced by these filings.

Returns. I compute Cumulative Abnormal Returns (CAR) for the cross-section of firms following the three-factor model of Fama and French (1992). I collect data on Developed Markets Excess Return, HML, and SMB factors from Kenneth French's website and

	Type of Defendant			
	All		First-time Defendants	Seasoned Defendants
	(1)	(2)	(3)	(4)
Scope 1 Emissions (in million tons CO2e)	0.0031***	0.0024***	0.0008***	0.0022***
	(24.29)	(21.02)	(8.61)	(27.32)
Scope 2 Emissions (in million tons CO2e)	0.0010	0.0012*	0.0008	0.0004
	(1.28)	(1.72)	(1.36)	(0.83)
Scope 1 Intensity	-6.4285***	-4.9135***	-1.1614**	-5.1391***
	(-9.22)	(-7.27)	(-2.12)	(-10.88)
Scope 2 Intensity	8.7822*	4.6723	3.6291	4.4694
	(1.93)	(1.19)	(1.13)	(1.63)
Firm Size (in million $)	0.0541***	0.0402***	0.0299***	0.0195***
	(4.66)	(3.80)	(3.47)	(2.63)
Cash and Short-Term Investments (in million $)	-0.2163***	-0.1791***	-0.1115**	-0.1102***
	(-3.43)	(-3.30)	(-2.53)	(-2.91)
Became Defendant in the Two Previous Years (0/1)		0.1869***		
		(26.23)		
Year	0.0018***			
	(5.10)			
Energy Firm (0/1)	0.0337***			
	(13.76)			
Disclosed Regulatory Risk (0/1)		0.0258	0.0334**	-0.0038
		(1.29)	(2.06)	(-0.27)
Disclosed Physical Risk (0/1)		-0.0380***	-0.0487***	0.0021
		(-3.23)	(-5.09)	(0.25)
Disclosed Legal Risk (0/1)		0.0031	0.0039	0.0037
		(0.50)	(0.77)	(0.84)
Disclosed Other Transition Risk (0/1)		0.0103	0.0106	0.0034
		(0.58)	(0.73)	(0.28)
Observations	9104	9083	9083	9060
Adj. R-squared	0.131	0.331	0.224	0.253
Mean (dep. var.)	0.005	0.004	0.002	0.002
SD (dep. var.)	0.067	0.064	0.048	0.042
Sector x Year FE	No	Yes	Yes	Yes
Country x Year FE	No	Yes	Yes	Yes

Note: T-statistics are in parentheses. Significance levels are indicated by * < .1, ** < .05, *** < .01.

Table 2: This table reports estimates from a linear probability model on the effects of Scope 1 and Scope 2 Emissions, Firm Size, Disclosures, and various covariates on the propensity to face a climate lawsuit. The dependent variable is an event indicator variable that equals one in the year a lawsuit is initiated against a firm and zero otherwise. The time-varying independent firm-level variables refer to the year preceding the lawsuit filing. Intensities are defined as the ratio of tonnes of CO2e per dollar of sales revenue.

	N	Mean	Sd	Minimum	p5	Median	p95	Maximum
CAR[-2,+2]	117	0.35 (0.45)	0.42	-20.81	-9.40	0.36	8.61	10.54
CAV[-2,+2]	117	-0.05 (-0.17)	1.62	-4.11	-2.21	-0.19	2.18	6.94

Note: T-statistics are in parentheses. Significance levels are indicated by * < .1, ** < .05, *** < .01.

Table 3: This table reports summary statistics for Cumulative Abnormal Returns and Cumulative Abnormal Volume in the [-2, 2] days around a climate litigation filing date. Results from a t-test on zero mean are also reported, with standard errors clustered at the lawsuit level. One case (*Smith v. Keurig Green Mountain, Inc. (2018)*) is excluded as Keurig was not a public company during the period that is used to estimate Abnormal Returns.

estimate the model by regressing stock returns on these factors:

$$R_{fd} = \alpha_f + \beta_{1f} R_m + \beta_{2f} R_{SMB} + \beta_{3f} R_{HML} + \epsilon_{fd},$$

where R_{fd} is the stock return for firm f on day d, R_m is the excess return on the market factor, R_{SMB} is the return on the size factor and R_{HML} is the return on the value factor. The estimates are used to compute the market implied returns and subsequently the Abnormal Returns, as the difference between the daily realized return and the three-factor-model implied returns:

$$\hat{R}_{fd} = \hat{\alpha_f} + \hat{\beta}_{1f} R_m + \hat{\beta}_{2f} R_{SMB} + \hat{\beta}_{3f} R_{HML}$$
$$AR_{fd} = R_{fd} - \hat{R}_{fd}$$

I set the event window to be [-2, 2] days around the filing of the litigation, and sum the Abnormal Returns over the event window to obtain the Cumulative Abnormal Returns for each stock and each litigation filing event:

$$CAR_{fl} = \sum_d AR_{fd} \mathbb{1}\Big(d \in [-2, +2] \text{ days around filing date of litigation } l\Big)$$

I obtain that the Cumulative Abnormal Returns in the [-2,2] days around the filing of a climate litigation is on average 0.35% (see Table 3). It is not significantly different

from zero, as a t-test on zero mean leads to a t-statistic of 0.45. This result comes in contrast with (i) literature about other types of litigations, including Environmental Violation litigations, which were found to lead to significant (albeit small, around 1.7%) losses in firm value (Karpoff et al., 2005); (ii) more closely related work by Sato et al. (2023) on the impact of climate litigations on firm value. The authors also work with the Sabin Center database but do not restrict it to U.S. cases or to filings that took place before 2020. They obtain an estimate for the value-weighted CAR[-1,1] around the filing date that is negative and significant, at around -.41%. In addition, they find that the significance is concentrated among Carbon Majors.

I further examine some of the determinants influencing the magnitudes of CARs to evaluate the extent to which climate litigations act as involuntary disclosures. Precisely, in columns 1 to 4 of Table 4, I evaluate whether the two components of disclosures, namely attention and information, play a role in the magnitude of the firm value reaction.

I find that both components of disclosure (1) information, as proxied by the length of the factual background in the complaint, and (2) attention, as measured by the search volume for the defendant's ticker, correlate with more pronounced negative firm value reactions at the time of filing. In addition, the pre-existing information environment also seems to play a significant role, as firms that have previously disclosed physical climate risk exposures experience less severely negative firm value reactions.

In addition, I find evidence of a pronounced political dimension, as filings during Republican administrations elicited less negative firm value reactions, suggesting the perception of a less stringent regulatory environment. Firm value reactions are also less negative for first-time defendants, even after accounting for factors such as higher emissions and larger firm size typical of firms that repeatedly face climate litigations.

Overall, these results suggest that the information and attention channels both correlate with the magnitude of firm value reactions around climate litigation filings. Furthermore, I find preliminary evidence that voluntary disclosures may serve as an effective risk management tool to mitigate the impact of involuntary disclosures originating from climate litigations.

	Returns				Volume			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Length Factual Background (in 1000s of words)	-0.18**	-0.18**	-0.22**	-0.15**	0.01	0.01	0.02	0.01
	(-2.14)	(-2.05)	(-2.31)	(-2.09)	(0.41)	(0.61)	(0.69)	(0.41)
ASVI	-0.05	-0.05	-0.05	-0.09**	-0.01	-0.01	-0.01	-0.02
	(-1.16)	(-1.16)	(-1.33)	(-2.43)	(-0.49)	(-0.53)	(-0.44)	(-0.69)
Firm Size (in million $)	0.92	1.11	0.05	3.45*	-0.42	-0.30	-0.06	-0.09
	(0.58)	(0.84)	(0.06)	(1.76)	(-1.09)	(-0.83)	(-0.23)	(-0.20)
Non-missing Scope 1 Emissions (0/1)		-0.94				-0.55		
		(-0.38)				(-0.96)		
Scope 1 Emissions (in million tons CO2e)			0.02	0.00			-0.00	-0.01
			(1.22)	(0.24)			(-1.09)	(-1.27)
Disclosed Regulatory Risk (0/1)				7.48				0.95
				(1.64)				(0.84)
Disclosed Physical Risk (0/1)				2.23**				-1.18***
				(2.42)				(-4.38)
Disclosed Legal Risk (0/1)				-1.21				4.85***
				(-1.07)				(6.26)
Disclosed Other Transition Risk (0/1)				-8.70*				-5.21***
				(-1.78)				(-3.96)
Republican Administration (0/1)				9.67**				0.13
				(2.22)				(0.13)
First-time Defendant (0/1)				2.27***				-0.47
				(2.78)				(-0.76)
Observations	109	109	99	99	109	109	99	99
Adj. R-squared	0.083	0.077	0.110	0.286	0.065	0.064	0.061	0.092
Mean (dep. var.)	0.500	0.500	0.419	0.419	-0.178	-0.178	-0.249	-0.249
SD (dep. var.)	4.478	4.478	4.037	4.037	1.740	1.740	1.726	1.726

Note: T-statistics are in parentheses. Significance levels are indicated by *< .1, ** < .05, *** < .01.

Table 4: The table reports results from cross-sectional regressions on the determinants of the magnitude of Cumulative Abnormal Returns and Cumulative Abnormal Volume. Following Da et al. (2011), Abnormal Search Volume Index (ASVI) is defined as the log Search Volume Index (SVI) on a firm's ticker on Google during the week of the filing minus the log median SVI during the previous eight weeks. The disclosure variables are lagged by a year, to account for the information environment at the time of the filing. Enforcement actions (5 cases) are excluded, as they do not entail filing a complaint. I haven't been able to find any complaints for 3 additional cases (*City of Birmingham Relief & Retirement System v. ExxonMobil Corp. (2018), Panoche Energy Center, LLC v. Pacific Gas & Electric Co. (2013) and United States Virgin Islands Office of the Attorney General v. ExxonMobil Corp. (2016)*). Finally, standard errors are clustered at the lawsuit level.

Volume. I also examine Cumulative Abnormal Volume (CAV) in the [-2, +2]-day window around the litigation filing date. I follow Chae (2005), and first compute turnover, defined as the ratio of trading volume for firm f on day d and outstanding shares:

$$\text{Turnover}_{fd} = \frac{\text{Trading Volume}_{fd}}{\text{Outstanding shares}_{fd}}$$

Then, I take logs to correct for the non-normality of the turnover data and obtain Abnormal Turnover, which is defined as turnover minus the average turnover in the [-40, -11] days before the litigation filing date:

$$AT_{fd} = \log(\text{Turnover}_{fd}) - \log(\sum_{t=-40}^{-11} \text{Turnover}_{ft})$$

Finally, I sum the Abnormal Turnover over the event window to obtain the Cumulative Abnormal Volume (CAV) for each stock and each litigation filing event:

$$CAV_{fl} = \sum_{d} AT_{fd} \mathbb{1}\Big(d \in [-2, +2] \text{ days around filing date of litigation } l\Big)$$

I obtain that the Cumulative Abnormal Volume in the [-2,+2]-day window surrounding the filing of a climate litigation, hovers at -0.05, and is not statistically significant from zero. While the market does not seem to exhibit unusual trading volume in response to involuntary disclosures, I further investigate whether specific characteristics of involuntary disclosures contribute to elevated abnormal trading volumes. According to the results presented in columns 5 to 8 of Table 4, an important factor influencing abnormal volumes is the level of disclosure prior to the litigation.

Specifically, I find that legal risk disclosures prior to a climate litigation event tend to increase trading volume, suggesting heightened investor disagreement, whereas disclosures related to physical risks and non-regulatory transition risks are associated with less abnormal volume in the litigation filing window. These results corroborate the conclusions drawn by Christensen et al. (2021) that the extent and nature of existing climate disclosures are significant in shaping disagreement as further relevant information is revealed about the firm.

Overall, I obtain that while climate litigations do not significantly affect firm value or trading volume, they exhibit the two components of disclosures, namely an information and an attention component, in firm value reaction. I also find that the extent and nature of pre-existing disclosures and the political context may influence investor reactions and disagreement over these litigations.

4.2 Institutional investors' reaction

I also examine institutional investors' reactions. These investors play an important role in increasing corporate transparency and in reducing climate risk exposure (Krueger et al., 2019; Stroebel and Wurgler, 2021), with a growing subset concerned with climate risks (Ilhan et al., 2023). Another feature of this type of institutional investors is their sophistication, which provides them with a more comprehensive overview of the information available prior to any involuntary disclosure. I hypothesize that the combined high willingness to learn about these types of risks and the high pre-existing awareness of these investors allow to evaluate whether the information incorporated in involuntary disclosures is new.

I categorize institutional owners based on their concern for climate issues and capacity to act upon the arrival of new information. These characteristics include their "greenness", assessed by whether they are signatories of the United Nations Principles for Responsible Investment (UNPRI), and the environmental tilt in their portfolio ("E tilt", and as proposed by Pastor et al. (2023)). In addition, I consider how actively they rebalance their portfolios, as measured by the Active Share (AS) of their holdings.

Empirical Strategy I use a matching procedure to identify, for each firm involved as a defendant in a climate litigation, another firm not involved in a climate litigation that is as comparable as possible. Among the set of public firms, I identify firms that operate in the same 2d-GICS sector, and that have never been involved as a defendant in a climate litigation. In my baseline results, I do not include any criterion on the country of incorporation of the firm, as the defendant firms are typically global ones. Instead, as detailed in the next subsection, I use country-year fixed effects to account for changes at

the country level. Among the remaining candidates, I focus on the ones that have the same Physical Risk Disclosure status as the defendant firm, and I select the nearest neighbor based on squared Euclidean distance, and on two variables: (i) Scope 1 Emissions, and (ii) Firm Size. The distances are computed using the standardized values in the year before the filing of the climate litigation.

I estimate a staggered difference-in-differences model, using all firm-quarter observations of the defendant and matched firms:

$$\begin{aligned} y_{ft} = \alpha_f &+ \beta_1 \mathbb{1}\Big[\text{Defendant in post-filing period}\Big]_{ft} \\ &+ \beta_2 \mathbb{1}\Big[\text{Defendant in post-filing period of a case with CAR[-2,2]<0}\Big]_{ft} + \\ &+ \beta_3 \mathbb{1}\Big[\text{Case with CAR[-2,2]<0}\Big]_{ft} + \alpha_c * \alpha_t + \alpha_s * \alpha_t + \epsilon_{ft}, \end{aligned}$$

where f indexes firms, t indexes quarters, and s indexes 2-digit GICS industries. In an attempt to focus on non-frivolous cases, I introduce an interaction term and isolate cases based on whether they were associated with negative Cumulative Abnormal Returns for the defendant firm. Finally, I follow Flammer (2021) and decompose between short-term effects (i.e. effect in the year after the filing); and long-term effects, at least two years after the filing date.

Parallel Trends Assumption I assess the likelihood of the assumption of parallel trends between treatment and control firms. Though I cannot fully test for this assumption because counter-factual outcomes after the onset of a climate litigation are unobservable, I test for parallel trends in the pre-treatment period between the treated defendant firms and their matched controls (Angrist and Pischke, 2008), using a binary variable equal to one in the quarter preceding the filing of a climate litigation.

Baseline Results Table 5 presents the ownership trends across various types of institutional investors before and after climate litigation filings. To assess pre-treatment trends between defendant firms and matched control firms, I include an interaction term for defendant firms with an indicator for the quarter preceding the litigation filing. In each case, the interaction term is not statistically significant at conventional levels, suggesting

that there are no differential trends.

I find that, in general, following the filing of a climate litigation, there are no significant shifts in ownership by "green" institutional investors, such as those who are UNPRI Signatories (columns 1 and 2) or those characterized by higher levels of E-tilt and Active Share (columns 7 and 8). However, in cases where firms experience negative Cumulative Abnormal Returns (CAR[-2,2]<0) around the filing date, I find a significant increase in ownership by UNPRI signatories in defendant firms, alongside a decrease in overall ownership by UNPRI signatories across both defendant and control firms. This increase is primarily seen among UNPRI signatories that combine a low E-tilt with a high Active Share (columns 3 and 4). When I extend the analysis to similar investors who are not UNPRI signatories, in columns 5 and 6, no significant changes in ownership post-litigation are observed for these groups.

Overall, these findings suggest that while climate litigations do not generally alter percentage ownerships by "green" institutional investors, non-frivolous climate litigations (CAR[-2,2]<0) are associated with an increase in ownership by a subset of investors, UNPRI signatories with a lower E-tilt and a higher Active Share. In a future version of this paper, I would like to explore whether these investors subsequently engage more actively with the defendant firms (rather than divest), consistent with the proactive approaches to corporate governance described in Krueger et al. (2019).

5 Effect on Defendant Firms

In this section, I assess whether climate litigations act as an effective external governance mechanism by examining their impact on defendant firms' policies. Specifically, I focus on (1) Scope 1 Emissions, and (2) Disclosures, and evaluate whether the climate litigations lead to more short-term pressure, as shown by Arena and Julio (2015) for shareholder class-actions, or if they reflect the claimants' objectives, such as a reduction in emissions and enhanced disclosures. Additionally, I account for the heterogeneity in lawsuit quality by differentiating cases based on whether their filing resulted in negative Cumulative Abnormal Returns for the defendant firm, thus investigating the link between financial

	UNPRI Signatories		UNPRI x Top Half(**Negative** E-tilt x AS)		Non-UNPRI x Top Half(**Negative** E-tilt x AS)		Top Half(**Positive** E-tilt x AS)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Case with CAR[-2,2]<0 (0/1)	0.110	-0.513***	0.042	-0.181	0.046	0.033	0.029	-0.053
	(0.63)	(-3.06)	(0.34)	(-1.37)	(0.81)	(0.54)	(0.22)	(-0.21)
Defendant in 1 quarter pre-filing period	0.341		0.040		0.101		0.130	
	(1.49)		(0.16)		(1.35)		(0.58)	
Defendant in 1 quarter post-filing period	0.079	-0.050	-0.349	-0.362	-0.015	-0.037	-0.390	-0.420
	(0.27)	(-0.17)	(-0.97)	(-1.10)	(-0.11)	(-0.29)	(-0.99)	(-1.16)
Defendant in 2+ quarters post-filing period	1.407*	-0.121	-0.194	-0.707	0.095	0.043	0.184	-0.029
	(1.72)	(-0.31)	(-0.40)	(-1.45)	(0.81)	(0.34)	(0.26)	(-0.08)
Defendant in 2+ quarters post-filing of case with CAR[-2,2]<0		3.800**		1.374*		0.070		0.492
		(2.46)		(1.89)		(0.58)		(0.36)
Observations	1334	1334	1334	1334	1334	1334	1334	1334
Adj. R-squared	0.98	0.98	0.98	0.98	0.93	0.93	0.94	0.94
Mean (dep. var.)	40.53	40.53	28.79	28.79	4.76	4.76	14.19	14.19
SD (dep. var.)	19.43	19.43	13.82	13.82	2.40	2.40	8.41	8.41
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector x Quarter FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: T-statistics are in parentheses. Significance levels are indicated by * < .1, ** < .05, *** < .01.

Table 5: This table reports results from panel regressions of changes in the percentage of ownership by different types of institutional investors, following the filing of a climate litigation. *UN PRI Signatories* represents, for a given firm-year observation, the percentage of ownership by institutional investors that have signed the UN Principles for Responsible Investment (PRI), while *UNPRI x Top Half(Negative E-tilt x AS)* represents the percentage of ownership by institutional investors that are UNPRI signatories, and that are in the top half of the distribution of the product of "Active Share" and "Negative E Tilt", i.e. those investors that both actively rebalance their portfolio and for whom environmental characteristics relatively do not matter in their portfolio allocation choices. *Non-UNPRI x Top Half(Negative E-tilt x AS)* are investors with similar characteristics, except they are not UNPRI signatories. Finally, *Top Half(Positive E-tilt x AS)* is the percentage ownership by institutional investors in the top half of the distribution of the "Positive E-tilt" and "Active Share", these are thus the investors that most actively rebalance their portfolio and for whom a stock's environmental characteristics matter positively. Finally, standard errors are clustered at the firm level.

repercussions and policy changes by defendant firms.

Empirical Strategy I use the same empirical strategy as in the previous section, including the same matching procedure, except for the fact that all data in this section is at the yearly frequency:

$$
\begin{aligned}
y_{ft} = \alpha_f &+ \beta_1 \mathbb{1}\Big[\text{Defendant in post-filing period}\Big]_{ft} \\
&+ \beta_2 \mathbb{1}\Big[\text{Defendant in post-filing period of a case with CAR[-2,2]<0}\Big]_{ft} + \\
&+ \beta_3 \mathbb{1}\Big[\text{Case with CAR[-2,2]<0}\Big]_{ft} + \alpha_c * \alpha_t + \alpha_s * \alpha_t + \epsilon_{ft},
\end{aligned}
$$

where t indexes years, f indexes firms, and s indexes 2-digit GICS industries.

Baseline Results In the first part of the results, presented in Table 6, Panel A, I explore the impact of climate litigations on firms' direct emissions. I test the parallel trends assumption by including an interaction term for defendant firms with an indicator for the year preceding the litigation filing. I find that the interaction term is not statistically significant at conventional levels, suggesting no differential trends pre-litigation.

In addition, I obtain that only those defendant firms that experienced negative Cumulative Abnormal Returns (CAR) within a 2-day window surrounding the litigation filing exhibit significant subsequent reductions in emissions. Specifically, these reductions in Scope 1 emissions average 2.7 million tons of CO2e, and are statistically significant at the 5% level. In contrast, climate litigations that do not impact firm valuation lead to no significant changes in the emissions profiles of the defendant firms, with no reductions in Scope 1 Emissions or Scope 1 Intensity observed post-filing.

Further examination of the sources of these emission reductions in columns 5 to 8 reveals that more than half of the reductions originate from decreased participation in polluting facilities within the U.S. (column 6), while emissions outside the EPA's regulatory scope remain unchanged (column 8).

In the second part of my results, detailed in Table 6, Panel B, I focus on climate risk disclosures by defendant firms. Although the parallel trends assumption does not hold for pre-litigation Physical Risk disclosures -supporting my earlier findings on the deter-

minants of becoming a defendant- interaction terms for other types of climate disclosures (Regulatory, Legal, and Other Transition Risks) do not exhibit differential trends prior to litigation. Moreover, I find no significant increase in the likelihood of disclosing climate risks among these firms, even among those that experienced negative CAR around the litigation filing.

In summary, while climate litigations generally do not induce changes in emissions or disclosures for defendant firms, specific non-frivolous climate litigations are linked to some emissions reductions in the years following the filing. Most of these reductions, however, are attributed to decreased involvement in EPA-regulated facilities, suggesting a strategy of divesting from polluting assets rather than implementing direct emissions abatement measures, in line with Duchin et al. (2022).

6 Effect on Peer Firms

In this section, I explore whether climate litigations can also impact firms that are not direct defendants but closely resemble those that are. The significant increase in stakeholder activism over the last decade has highlighted its role in promoting industrial transparency (Daubanes and Rochet, 2019). This type of activism often prompts firms to adopt self-regulatory measures to mitigate the risk of facing more stringent regulatory requirements (Maxwell et al., 2000) or of becoming involved in climate litigation themselves. I study whether climate litigations also affect non-defendant firms, and can encourage preemptive changes within industries.

Estimation Strategy I follow Arena and Julio (2015) and focus on the firms that operate in the same industry as the defendant firm, but that have not become defendants in a climate litigation in that year. Then, I identify the firms close to the defendants using the three important determinants I identified in Table 2, namely Scope 1 Emissions and Firm Size, and whether a firm has disclosed some Physical Risk exposure. I measure the Euclidean distance between the defendant firms and all other firms in the 4d-GICS industry and select either the N=1, 3, or 5 closest neighbors. These firms constitute my treated group, for which I estimate the following difference-in-differences:

Panel A: Emissions

	Scope 1 Emissions		Scope 1 Intensity		EPA Emissions		Residual	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Case with CAR[-2,2]<0 (0/1)	-0.837	-0.406	46.685	49.031	-0.207**	0.070	-1.271	-0.868
	(-1.20)	(-0.67)	(1.49)	(1.46)	(-2.55)	(0.50)	(-1.69)	(-1.30)
Defendant in 1 year pre-filing period	-0.149		31.594		-0.169		0.220	
	(-0.69)		(0.66)		(-0.79)		(0.73)	
Defendant in 1 year post-filing period	-0.177	-0.001	62.930	57.205	0.102	0.200	-0.431	-0.389
	(-0.24)	(-0.00)	(1.12)	(1.10)	(0.20)	(0.38)	(-0.76)	(-0.65)
Defendant in 2+ years post-filing period	0.067	1.501	154.795*	155.742*	0.040	1.091	-0.463	0.409
	(0.08)	(1.21)	(1.86)	(1.97)	(0.07)	(1.20)	(-0.55)	(0.35)
Defendant in 2+ years post-filing of case with CAR[-2,2]<0		-2.709**		-17.342		-1.815**		-1.583
		(-2.12)		(-0.19)		(-2.24)		(-1.43)
Observations	499	499	499	499	507	507	323	323
Adj. R-squared	0.990	0.991	0.978	0.978	0.984	0.985	0.987	0.987
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector x Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Disclosures

	Reported Physical		Reported Transition		Reported Legal		Reported Other Transition	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Case with CAR[-2,2]<0 (0/1)	-0.042	-0.043	-0.031	-0.029	-0.006	-0.002	-0.007	-0.004
	(-1.05)	(-0.94)	(-0.70)	(-0.58)	(-0.17)	(-0.06)	(-0.20)	(-0.12)
Defendant in 1 year pre-filing period	-0.059*		-0.036		-0.047		-0.047	
	(-1.86)		(-0.99)		(-1.66)		(-1.67)	
Defendant in 1 year post-filing period	-0.045	-0.031	0.004	0.013	-0.088	-0.076	-0.093	-0.081
	(-0.43)	(-0.30)	(0.02)	(0.08)	(-0.72)	(-0.63)	(-0.76)	(-0.67)
Defendant in 2+ years post-filing period	0.020	0.032	0.113	0.129	-0.039	-0.016	-0.050	-0.031
	(0.13)	(0.18)	(0.46)	(0.48)	(-0.20)	(-0.08)	(-0.25)	(-0.15)
Defendant in 2+ years post-filing of case with CAR[-2,2]<0		0.011		-0.011		-0.019		-0.010
		(0.10)		(-0.09)		(-0.18)		(-0.10)
Observations	579	579	579	579	579	579	579	579
Adj. R-squared	0.521	0.520	0.557	0.556	0.554	0.553	0.566	0.565
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector x Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Standard errors are clustered at the firm level. T-statistics are in parentheses. Significance levels are indicated by * < .1, ** < .05, *** < .01.

Table 6: This table presents the findings from panel regressions exploring the impact of a firm becoming a defendant in climate litigation on various firm-level outcomes. Panel A focuses on direct emissions, which are continuous outcome variables. *Scope 1 Intensity* is defined as the ratio of Scope 1 Emissions to Revenues, *EPA Emissions* includes total emissions from facilities regulated by the EPA as recorded in the FLIGHT database, while *Residual* is the difference between *Scope 1 Emissions* and *EPA Emissions*. Panel B examines climate risk disclosures, which are binary outcome variables and set to 1 if the firm discloses certain types of climate risks. *Reported Other Transition* risks pertain to non-regulatory transition risks, specifically Market and Reputation risks. Finally, standard errors are clustered at the firm level.

$$
\begin{aligned}
y_{ft} = \alpha_f &+ \beta_1 \mathbb{1}\Big[\text{Neighbor of a firm that became defendant in a climate litigation}\Big]_{ft} \\
&+ \beta_2 \mathbb{1}\Big[\text{Neighbor of firm defendant in a case with CAR[-2,2]<0}\Big]_{ft} \\
&+ \beta_3 \mathbb{1}\Big[\text{Case with CAR[-2,2]<0}\Big]_{ft} \\
&+ \alpha_c * \alpha_t + \alpha_s * \alpha_t + \epsilon_{ft},
\end{aligned}
$$

where α_f are firm fixed effects, and I also have sector-year and country-year fixed effects. Firms in the same 4d-GICS industry that have not become defendants in a climate litigation, and that are not among the closest neighbors of defendant firms, represent my control group. I use firm fixed effects to account for the fact that the defendant firms (and their neighbors) are typically among the larger firms in each sector. On the other hand, country-year and sector-year fixed effects help capture changes that occur over time, such as alterations in country-level or sector-level regulations. With this specification, my goal is to measure the effect on firms that are close (and could potentially be the next target for climate litigants), and whether despite not being directly targeted, those firms change their behavior more than changes in regulation force them to.

Baseline Results First, I analyze the impact of climate litigations on the direct emissions of peer firms (Table 7, Panel A). I find that there is generally no significant effect on the emissions of peer firms, with the notable exception of the first closest neighbor and in cases that have resulted in negative abnormal returns for the defendant. In these specific instances, I obtain that there is a significant decrease in emissions of the first peer firm, which amounts to 2.2 million tons of CO2e emissions, while I obtain no significant changes in Scope 1 Emissions and Intensity among the further peer firms.

I obtain quite different results when examining disclosures (Table 7, Panel B), particularly concerning Legal and Other Transition (i.e., Market or Reputation) risk disclosures. Following the filing of cases with negative Cumulative Abnormal Returns (CAR[-2,2]<0), I find a notable increase in the likelihood that neighboring firms will disclose their climate risks. This increase is particularly strong in the area of Legal risks and is consistent across all types of neighboring firms examined. Additionally, there is also an observed increase

in the likelihood of disclosing Physical Risk exposure, although this is restricted to the closest neighbors of firms that experienced negative CAR around the time of litigation.

Overall, my findings indicate limited peer effects on emissions; however, there is a noticeable increase in industrial transparency—evidenced by heightened disclosure activities—following the initiation of a climate litigation. This suggests that climate litigation may serve as a catalyst for enhanced disclosure practices and transparency across an industry, particularly among firms closely linked to the defendant.

Panel A: Emissions

	Scope 1 Emissions			Scope 1 Intensity			EPA Emissions			Residual		
	(1) N= 1	(2) N= 3	(3) N= 5	(4) N= 1	(5) N= 3	(6) N= 5	(7) N= 1	(8) N= 3	(9) N= 5	(10) N= 1	(11) N= 3	(12) N= 5
Neighbor in post-filing period	1.326	0.597	0.645	-0.001***	-0.000	-0.000	-0.707***	0.064	-0.198	0.803	0.181	0.555
	(1.61)	(1.13)	(1.17)	(-14.08)	(-1.18)	(-0.33)	(-3.43)	(0.17)	(-0.58)	(0.92)	(0.26)	(0.75)
Neighbor post-filing of case with CAR<0	-2.208***	0.644	0.523	0.001***	0.000	-0.000	0.040	-0.209	0.799	-1.081**	1.019	-0.409
	(-3.32)	(0.51)	(0.55)	(5.12)	(0.17)	(-0.01)	(0.06)	(-0.31)	(0.99)	(-2.16)	(1.04)	(-0.31)
Case with CAR[-2,2]<0	0.998*	-1.626	-1.396	0.000	0.000	0.000	1.587*	0.029	-0.625	0.080	-1.489	-0.562
	(1.75)	(-0.95)	(-1.04)	(0.75)	(0.30)	(0.18)	(1.73)	(0.04)	(-0.92)	(0.11)	(-1.15)	(-0.43)
Observations	16617	16617	16617	16470	16470	16470	73743	73743	73743	16617	16617	16617
Adj. R-squared	0.915	0.915	0.915	0.947	0.946	0.946	0.801	0.801	0.801	0.874	0.874	0.874
Mean (dep. var.)	2.089	2.089	2.089	0.000	0.000	0.000	0.182	0.182	0.182	1.602	1.602	1.602
SD (dep. var.)	9.530	9.530	9.530	0.001	0.001	0.001	2.785	2.785	2.785	8.003	8.003	8.003
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector x Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Disclosures

	Reported Physical			Reported Transition			Reported Legal			Reported Other Transition		
	(1) N= 1	(2) N= 3	(3) N= 5	(4) N= 1	(5) N= 3	(6) N= 5	(7) N= 1	(8) N= 3	(9) N= 5	(10) N= 1	(11) N= 3	(12) N= 5
Neighbor in post-filing period	-0.629***	-0.120	-0.168	-0.383***	-0.122	-0.179	-0.081***	0.050	0.051	-0.086***	0.031	0.037
	(-97.22)	(-0.51)	(-0.93)	(-60.47)	(-0.52)	(-0.99)	(-11.67)	(0.51)	(0.42)	(-12.07)	(0.31)	(0.30)
Neighbor post-filing of case with CAR<0	0.529***	0.218	0.160	0.107	0.109	0.154	0.300**	0.347***	0.409***	0.379***	0.445***	0.469***
	(13.17)	(0.81)	(0.78)	(0.70)	(0.43)	(0.79)	(2.06)	(2.68)	(2.99)	(2.98)	(4.21)	(3.65)
Case with CAR[-2,2]<0	0.597***	0.429***	0.511***	0.630***	0.523***	0.545***	0.154**	-0.152**	-0.173***	-0.060	-0.256***	-0.237***
	(3.26)	(3.67)	(6.18)	(3.78)	(6.04)	(9.24)	(2.32)	(-2.22)	(-3.45)	(-0.26)	(-2.92)	(-3.97)
Observations	73743	73743	73743	73743	73743	73743	73743	73743	73743	73743	73743	73743
Adj. R-squared	0.571	0.572	0.574	0.582	0.583	0.585	0.258	0.259	0.261	0.270	0.272	0.274
Mean (dep. var.)	0.034	0.034	0.034	0.037	0.037	0.037	0.016	0.016	0.016	0.019	0.019	0.019
SD (dep. var.)	0.182	0.182	0.182	0.189	0.189	0.189	0.127	0.127	0.127	0.135	0.135	0.135
Firm FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country x Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Sector x Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: T-statistics are in parentheses. Significance levels are indicated by * < .1, ** < .05, *** < .01.

Table 7: This table presents the findings from panel regressions exploring the impact of climate litigations on firms that closely resemble a defendant firm, focusing on the N=1, 3, and 5 closest neighbors of a defendant firm. Panel A focuses on direct emissions, which are continuous outcome variables. *Scope 1 Intensity* is defined as the ratio of Scope 1 Emissions to Revenues, *EPA Emissions* includes total emissions from facilities regulated by the EPA, while *Residual* is the difference between *Scope 1 Emissions* and *EPA Emissions*. Panel B examines climate risk disclosures, which are binary outcome variables and set to 1 if the firm discloses certain types of climate risks. *Reported Other Transition* risks pertain to non-regulatory transition risks, specifically Market and Reputation risks. Finally, standard errors are clustered at the firm level.

7 Conclusion

I study the impact of involuntary disclosures on investors and corporate behavior. As the demand for climate-related information is growing, voluntary disclosures have become more common, yet a significant portion of the economy remains reluctant to disclose such information. In parallel, mandatory disclosures are increasing, but they often lack the flexibility to be tailored specifically to each firm. This is particularly crucial as climate information introduces new, not well-understood risks that are likely to vary across different firms. By focusing on involuntary disclosures stemming from climate litigations, I examine a new source of information that both escapes strategic behavior by firms and can be uniquely tailored for each specific company.

Using cases filed in the United States from 2012 to 2019, I find that, on average climate litigations do not significantly affect firm value or emissions levels, nor do they lead to substantial divestments by green institutional investors. However, when these cases capture significant negative investor attention, indicated by negative Cumulative Abnormal Returns, they result in significant reductions in the emissions of the defendant firms.

I also examine how these involuntary disclosures influence climate risk disclosures among firms. I find again that only in instances where litigations lead to negative financial impacts do neighboring firms enhance their disclosures, particularly in legal, market and reputation risks. In contrast, I find limited evidence of an additional increase in voluntary disclosures for defendant firms. Overall, my results underscore the role, but also some of the limitations, of climate litigations not just as legal challenges but as catalysts for improving industry-wide transparency and accountability in environmental issues.

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Appendix

A Additional Institutional Details

A.1 Climate change laws in the U.S.

Some legal frameworks that allow to address the climate issue, and regulate greenhouse gas (GHG) emissions exist in the U.S. and have been established at the federal and state levels.

At the federal level, the main regulatory body is the *Environmental Protection Agency* (EPA). Since the enactment of the *Clean Air Act* in 1970, this agency has been tasked with providing the legal framework for regulating air pollution as well as enforcing such regulations. However, it is only since 2011 that the EPA has been in charge of regulating GHGs, after a legal battle led to the Supreme Court's decision in *Massachusetts vs Environmental Protection Agency* granting GHGs the statute of "air-pollutants".
In practice, if a violation is identified by the EPA, the agency first engages in negotiations with the alleged violator to reach a settlement. In case a settlement cannot be reached, the EPA may file legal action against the alleged violator, in order to obtain a court order requiring compliance, penalties, and other appropriate remedies.

However, climate regulation under the *Clean Air Act* remains fragile (Richardson, 2020), and more ambitious legal bases are required. In a polarised political environment, in which passing climate laws in Congress has proved difficult, some states and local governments are now also taking action to reduce emissions, with varying levels of ambition. California has long been at the forefront of environmental initiatives related to global warming with actions such as the 2006 *Global Warming Solutions Act*. Some of the East Coast states, such as New York and Massachusetts, have also enacted significant regulations and are now participating in a cap-and-trade carbon dioxide emissions program for power generators, called the *Regional Greenhouse Gas Initiative*.

However, environmental law violations litigations, e.g. litigations based *Clean Air Act* violations, have mostly focused on localized environmental degradation, such as in-

stances of air contamination[4]. This type of litigation leads defendant firms to suffer high legal fines and fees, but have instead limited effects imputable to reputation losses (Karpoff et al., 2005).

A.2 Legal grounds for climate litigations

In contrast, the set of litigations I examine is supported by a more heterogeneous body of law and takes other forms than the traditional environmental law violations (Bouwer, 2018). The clusters of legal claims they typically fall into vary more widely, with:

1. **Civil action lawsuits:** These cases are based on the claim that corporations are liable for damages in relation to lack of environmental governance and failure to mitigate their climate impact. Just like lawsuits involving companies subject to asbestos litigations (Taillard, 2013), these legal actions could have significant financial consequences. The debate surrounding this type of lawsuit mainly centers on two key concerns: firstly, attributing precise climate impacts to individual corporations poses considerable difficulties. Secondly, these lawsuits are subject to the principle of "standing", which requires plaintiffs to establish direct, personal harm resulting from the defendant's actions.
2. **Class action lawsuits:** These cases typically involve a large group of individuals who have suffered similar harm and decide to collectively sue a company. A major case in my database is *Ramirez vs Exxon Mobil Corp. (2016)*, which represents a securities fraud class action suit alleging Exxon Corp. (the defendant) failed to disclose climate risks in its financial statement.
3. **Judicial review cases** typically allow confronting corporations in their decisions to undertake a harmful project. Precisely, judicial review proceedings can be sought out to scrutinize the relevant legislative scheme and identify any potential errors in the decision-making approach of targeted companies, which could have led to the approval of a project that contradicts the country's legislation. Remedies may include a ban, or requirements to provide project evaluation in relation to its environmental

[4] An illustrative example is the famous legal battle between Erin Brockovich and PG&E, which centered around the contamination of water sources.

consequences.

4. Finally, **Constitutional and Human rights lawsuits:** These cases are premised on the assertion that climate change represents a threat to human rights as it poses a serious risk to the fundamental rights to life, health, food, and an adequate standard of living of individuals and communities. The main challenge consists in attributing climate change-related harm to acts or omissions of specific companies.

B Additional Descriptive Statistics

	N	Mean	Sd	Minimum	p5	Median	p95	Maximum
Log(Assets) (in $) [Compustat]	75328	5.58	3.24	-6.91	-0.29	6.01	10.17	19.36
Sales (in million $) [Compustat]	74964	0.03	1.42	0.00	0.00	0.00	0.01	142.53
Cash (in million $) [Compustat]	75310	0.01	0.35	0.00	0.00	0.00	0.00	32.07
Scope 1 Emissions (in million tons CO2e) [Trucost]	17041	1.40	7.29	0.00	0.00	0.01	5.22	133.99
Scope 2 Emissions (in million tons CO2e) [Trucost]	17363	0.20	0.86	0.00	0.00	0.02	0.83	18.38
Scope 1 Intensity [Trucost]	17014	242.06	1063.51	0.00	0.53	13.19	990.53	26533.68
Disclosed Physical Risk (0/1) [CDP]	75328	0.02	0.14	0.00	0.00	0.00	0.00	1.00
Disclosed Regulatory Risk (0/1) [CDP]	75328	0.02	0.15	0.00	0.00	0.00	0.00	1.00
Disclosed Other Transition Risk (0/1) [CDP]	75328	0.02	0.15	0.00	0.00	0.00	0.00	1.00
Emissions from polluting facilities (in million tons CO2e) [Flight]	3199	4.84	13.06	0.00	0.02	0.57	26.96	125.06
# of polluting facilities [Flight]	3199	9.61	21.48	0.01	1.00	3.06	37.00	259.00
# of green patents [KPSS]	43976	0.59	9.79	0.00	0.00	0.00	0.00	530.00
# of patents [KPSS]	43976	10.09	141.24	0.00	0.00	0.00	0.00	9524.00

Table B.1: Summary statistics for the entire dataset.

Litigation data

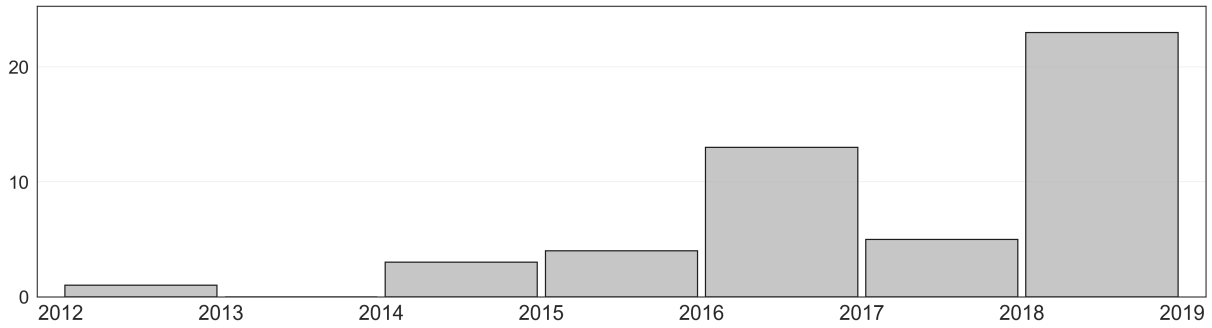


Figure B.1: This figure describes the number of cases filed each year between 2012 and 2019.

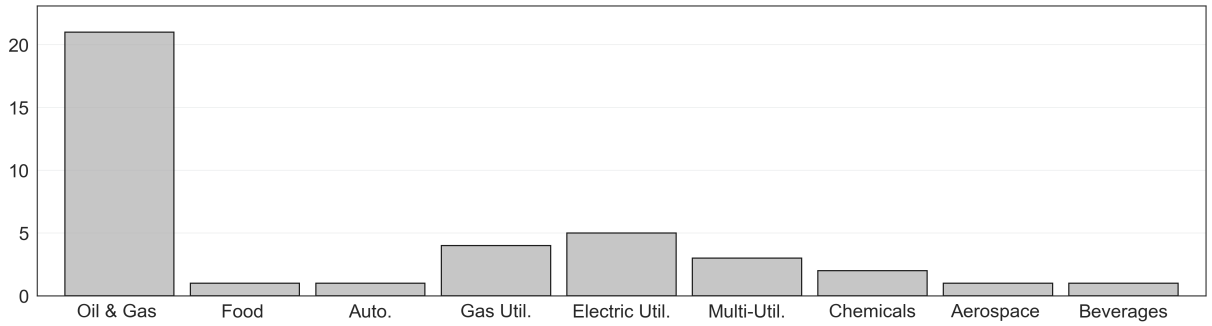


Figure B.2: This figure describes the number of cases in each sector, where sectors are defined at the GICS-6digit level.

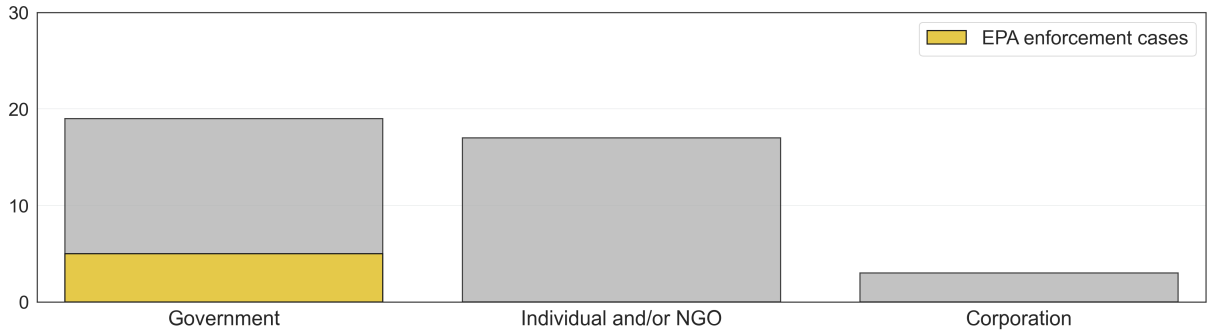


Figure B.3: This figure describes the number of cases filed by each type of claimant.

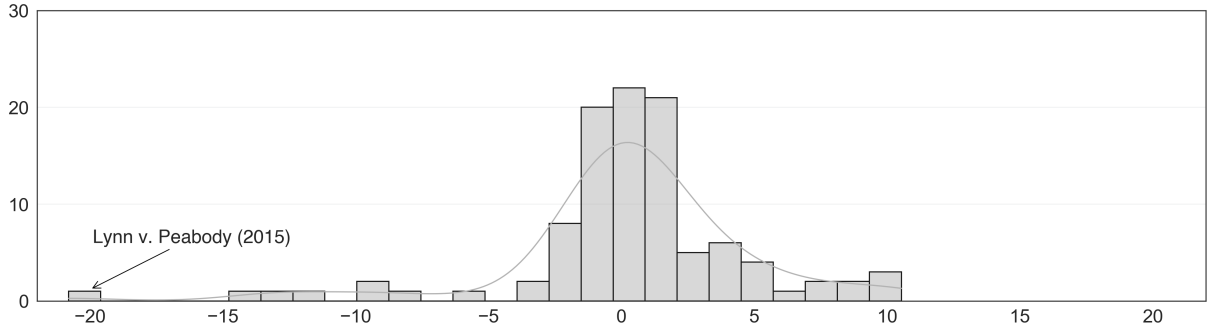
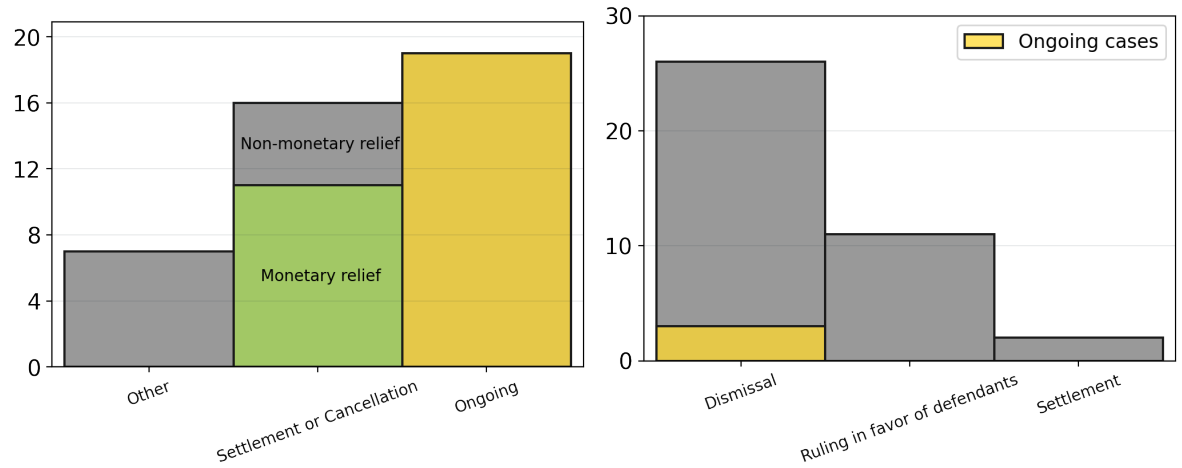


Figure B.4: This figure describes the distribution of CAR[-2,2] for the cases filed between 2012 and 2019.



(a) Last Decision in Favor of Defendant (b) Last Decision in Favor of Claimant

Figure B.5: This figure describes whether, for each climate litigation, the most recent outcome was more in favor of the defendant (left-hand-side) or the claimant (right-hand-side). I use Sato et al. (2023)'s data, which I complement with news data, to categorize litigation outcomes.

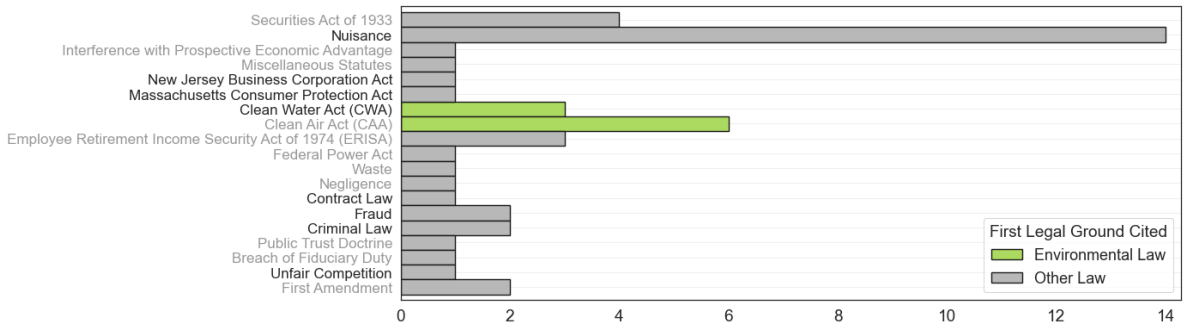


Figure B.6: This figure describes the different primary legal grounds used by the claimants for the cases filed between 2012 and 2019. Legal grounds written in gray represent pieces of **Federal** law, while those in black represent **State** law.

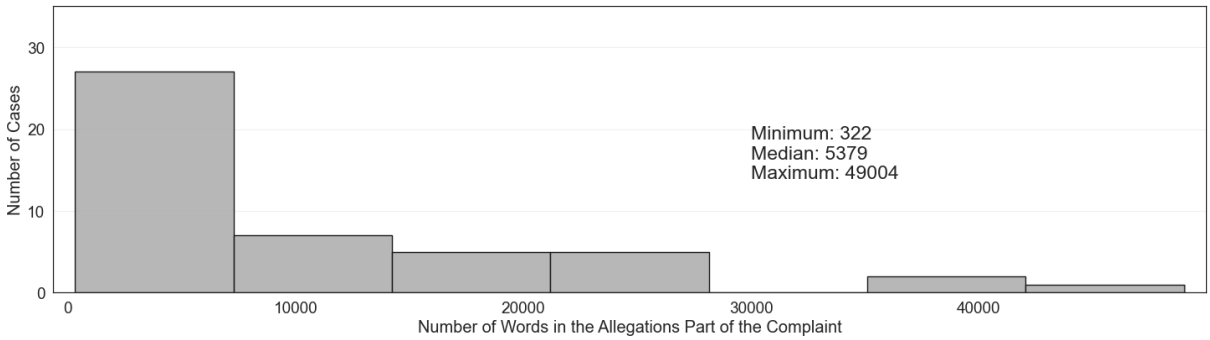


Figure B.7: This figure describes the distribution of the number of words in the allegations part of the complaints filed between 2012 and 2019.

KPSS database

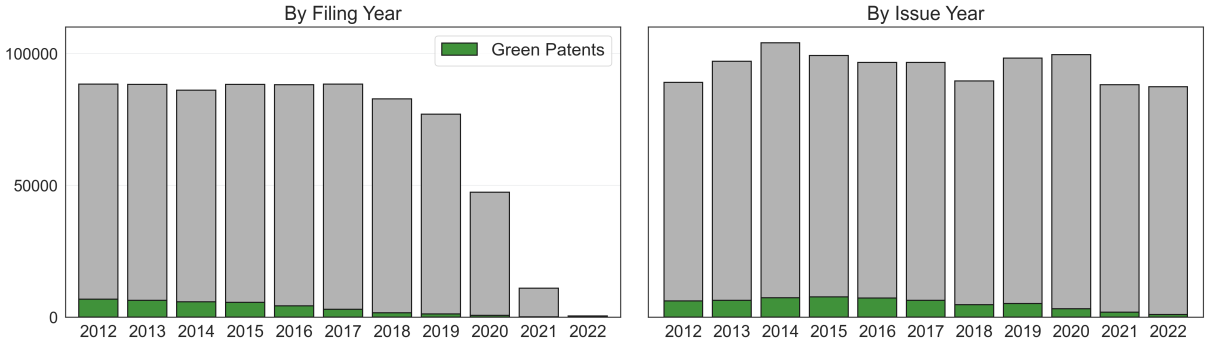


Figure B.8: This figure describes the number of patents filed (left-hand-side) and issued (right-hand-side) for each year, with an additional breakdown between green and non-green patents.

Flight database

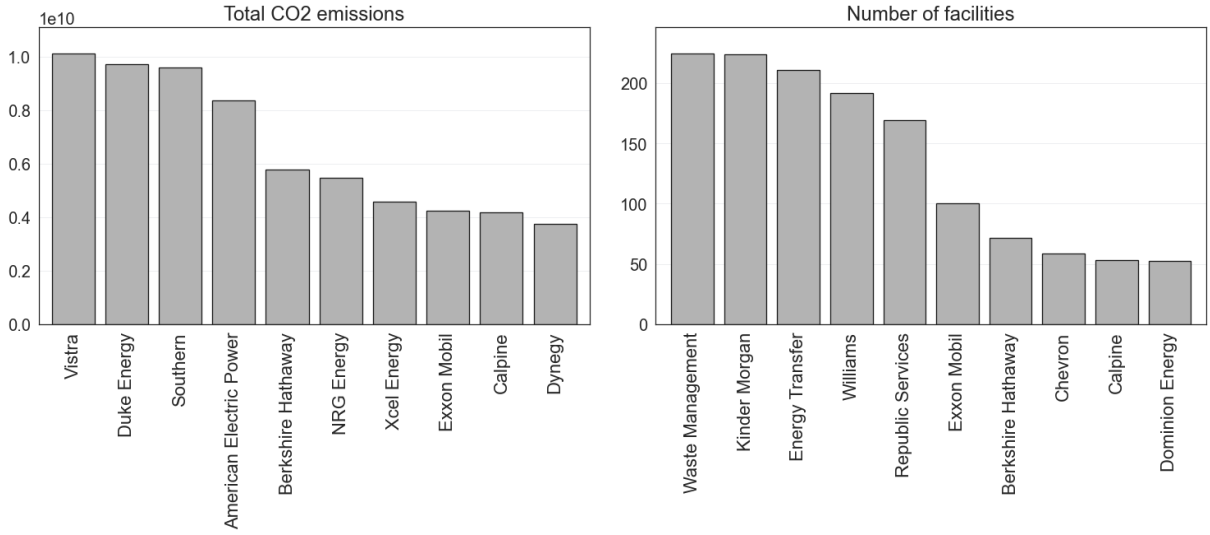


Figure B.9: This figure describes the companies in the top 10 of emissions (left) and those in the top 10 for their number of polluting facilities (right). For both variables and for each firm, I compute the average over all years between 2012 and 2021, and then sort those averages.

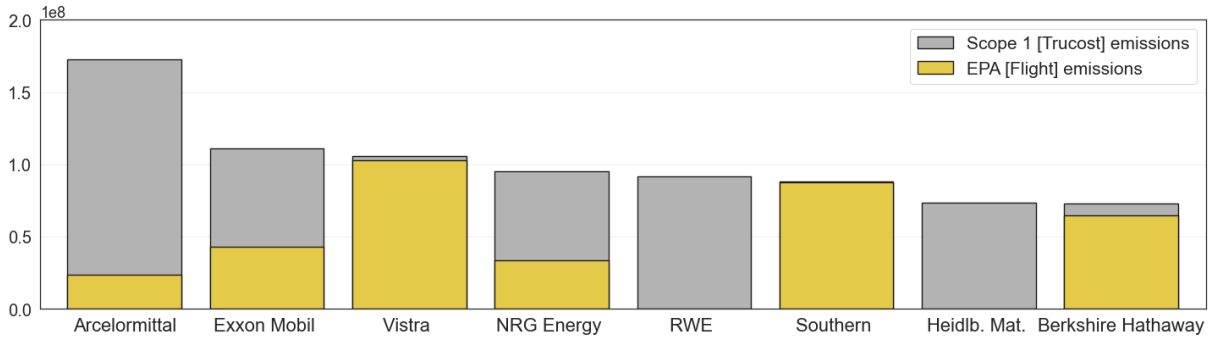


Figure B.10: This figure describes, for the year 2019 and the top 10 emitting companies in the sample, the total Scope 1 direct emissions reported in Trucost as well as the total emissions reported across all polluting facilities in the Flight database that are owned by the firm.

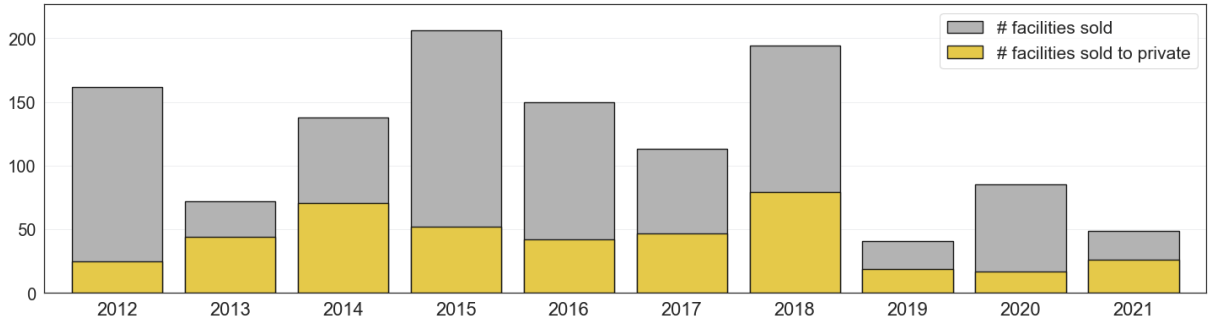


Figure B.11: This figure describes the number of facilities included in the Flight database that are sold by public companies in each year, as well as the fraction that is sold to private investors.

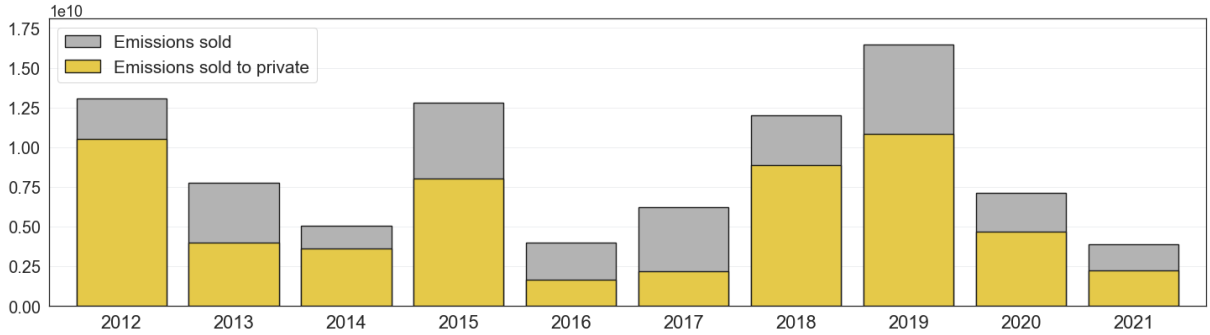


Figure B.12: This figure describes the total emissions stemming from facilities that are included in the Flight database and that are sold by public companies in each year, as well as the fraction that is sold to private investors.

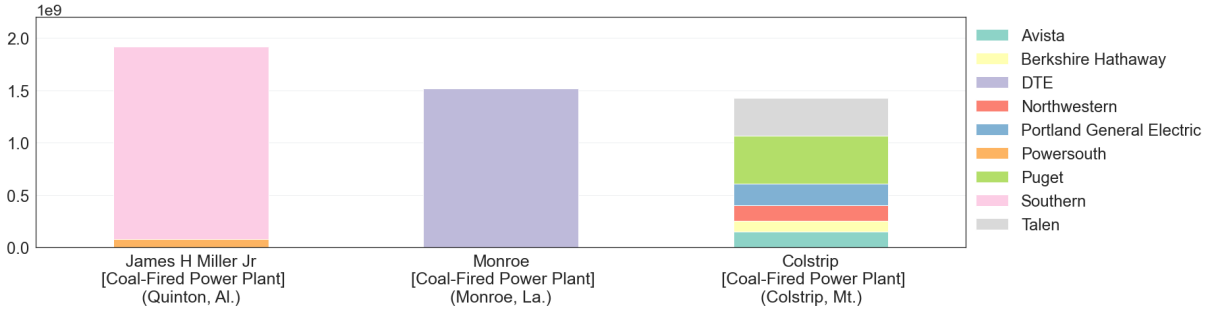


Figure B.13: This figure describes the top 3 CO2e emitting facilities in the Flight database for the year 2019, their nature, location, and their owners equipped with their respective ownership percentages.