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Evidence from Latin America

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Abstract

This paper studies the interplay between environmental performance and financial valuation of firms in Latin America and the Caribbean. We provide insights into how environmental considerations are integrated into financial decision-making and investor behavior by analyzing the stock market reaction to environmental news of firms with different levels of carbon emission intensity. We find that high emission intensity firms tend to underperform after the release of environmental damage news. Our baseline estimates indicate that, after the release of such news, firms at the 75th percentile of the distribution of emission intensity experience stock returns that are 17% lower than those of firms at the 25th percentile of the distribution of emission intensity. These results suggest that investors care about and price carbon risk, but only when this risk is salient.

JEL classifications: G12, G14, G18, G32, G38, Q54

Keywords: Carbon emissions, Climate change, Environmental news, Stock returns

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1 Introduction

We investigate the impact of environmental damages news on the stock returns of firms in Latin America and the Caribbean. We focus on how this impact varies with firm-level carbon emission intensity. We find that high emission intensity firms underperform after the release of environmental damage news and show that this result is principally driven by domestic news. Our findings indicate that environmental factors play an important role in firms' financial performance and investors' decision-making.

There is near unanimity on the anthropogenic origin of climate change and a better understanding of the link between carbon emissions and financial performance is key for devising policies aimed at creating incentives for reducing emissions. Firms, particularly in certain sectors, are significant contributors to releasing greenhouse gas (GHG).[1] These emissions are key drivers of global warming and climate change, phenomena that are altering the earth's natural systems at an unprecedented rate.

We focus on environmental damages because GHG emissions contribute to the intensification of extreme weather events, such as hurricanes, floods, and droughts, which have devastating ecological and economic consequences (see, for example, Min et al. (2011)) Moreover, rising global temperatures result in melting polar ice caps, rising sea levels, and destroying habitats. This cascade of effects disrupts biodiversity and poses substantial risks to wildlife, marine life, and natural ecosystems. The alteration in climate patterns also has profound implications for agriculture, water resources, and human health, creating a domino effect of environmental challenges. Even though environmental damages are not necessarily related to climate change (think of an oil spill), media coverage of such events can make the climate change discourse salient and impact investment decisions, either through a preference shift towards greener assets or heightened public awareness of environmental risks, affecting firms' perceived future financial performance. In fact, there is evidence that investors perceive firms with higher carbon emissions as less environmentally responsible (Dahlmann et al., 2019), and this perception can lead to a more negative reaction after the release of environmental damage news, even if the specific piece of news is not directly directly related to climate change (Lee et al., 2015).

To study the relationship between stock market performance, environmental damage news, and carbon emission intensity, we combine firm-level emission intensity data with daily stock return data and a specifically constructed high-frequency dataset of environmental damage news. Our analysis includes a sample of 840 firms based in 16 countries across Latin America and the Caribbean, covering a period of 13 years (2009-2022). By using an econometric specification that builds on Hengge et al. (2023), we find that the release of environmental damage news negatively impacts the stock market performance of firms with high emission intensities. We observe that firms at the 75th percentile of emission intensity distribution experience stock returns that are

[1] In the rest of the paper, we will use carbon emissions and green house gas (GHG) interchangeably.

17% lower compared to those at the 25th percentile. Our findings are primarily influenced by the extensive margin (i.e., the presence of at least one piece of news) and are mostly associated with the release of domestic rather than regional or global news. Additionally, our results are not attributed to a specific country, nor do they capture a spurious relationship driven by firm characteristics such as size, profitability, or sector of operation, which could be correlated with both carbon emission intensity and stock returns.

Our paper is related to two strands of literature. The first strand focuses on on the link between carbon emissions and stock returns. Two influential papers by Bolton and Kacperczyk (2021, 2022) find that the level of carbon emissions is associated with higher stock returns in a cross-section of firms. According to Bolton and Kacperczyk (2021, 2022), this negative association is driven by the presence of a carbon risk premium: investors require higher returns to hold stocks of companies that are exposed to carbon pricing and regulation risk. This result has been challenged by Zhang (2023), who suggests that researchers should focus on lagged emissions, and by Aswani et al. (2023), who suggest that carbon emission intensity (instead of the level of emissions) should be the appropriate measure of carbon risk (for a rebuttal, see Bolton and Kacperczyk, 2023).

Three papers that, like us, use high-frequency stock prices are Bolton et al. (2022), Millischer et al. (2022), and Hengge et al. (2023). These authors study the impact of carbon price on stock returns within the European Union Emission Trading Scheme (EU ETS). Bolton et al. (2022) and Millischer et al. (2022) show that firm-level availability of carbon allowances is an important driver of the link between carbon price and stock returns. These results indicate that, within the EU ETS, carbon price affects stock returns through an input cost channel. Hengge et al. (2023) use carbon policy surprises and show that transition risk also plays a role because tight carbon policy affects the performance of firms that do not participate in the EU ETS. The presence of a transition risk is also supported by research showing that carbon pricing shocks have a negative effect on stock returns of brown firms (Berthold et al., 2023). This strand of the literature highlights the different effect of carbon emission in equilibrium and in the aftermath of shocks. In equilibrium, green assets are expected to have lower return because they make it possible to hedge climate risk. However, green assets are expected to outperform brown assets in the aftermath of shocks that reveal the risk associated with the latter (for a theoretical model that clarifies this difference see Pástor et al., 2021) .

The second strand is related to the effect of news, especially environmental news, on stock returns. Research that analyzes the link between news and stock returns goes back to at least Cutler et al. (1989), who cast doubts on the idea that stock price movements are fully driven by news about future cash flows and discount rates. More recent work uses sentiment analysis of news to show that media tone has an impact on stock prices and that the impact is generally larger for negative news (see, among others, Garcia, 2013, Zhang et al., 2016, Fraiberger et al., 2021). Jeon et al. (2022) show that the sensitivity of stock returns to news has been increasing

over time and it is stronger for firms with high media visibility.

More closely related to our work are studies that focus on environmental news. Capelle-Blancard and Laguna (2010) study stock market reactions to industrial disasters by using data on 64 explosions in chemical plants and refineries. They find that petrochemical firms experience a sharp drop in market value in the two days that follow the report of an explosion. Along similar lines, Carpentier and Suret (2015) use New York Times reporting to study how equity markets respond to 161 major environmental and non-environmental accidents. Contrary to previous studies, they do not find a long-lasting effect of environmental accidents on stock returns. Flammer (2013) uses corporate news related to environmental issues to conduct an event study and finds a positive association between the stance of environmental reporting and stock returns. She also documents that this relationship has become asymmetric over time, with a decreasing positive effect for eco-friendly behavior and an increasingly negative effect for eco-harmful behavior. Faccini et al. (2023) use textual and narrative analysis of climate change-related news and show that climate risk associated with government interventions has an effect on equity returns in the United States. Engle et al. (2020) use text analysis of newspaper coverage of climate change to build climate change risk-hedged portfolios. Ardia et al. (2020) build a climate change concern index based on news published in US newspapers and find that stock returns of firms exposed to this index are associated with firm-level carbon emission intensity. El Ouadghiri et al. (2021) use data on climate-related disasters together with US news on climate change and pollution and Google searches on these terms to show that public attention is positively associated with returns of sustainability-focused stock indices and negatively associated with returns of conventional stock indices. Bessec and Fouquau (2022, 2024) also focus on environmental news coverage in US newspapers and use textual analysis to classify these news items along different measures of tonality and uncertainty. They find that news releases about the environment with either a negative or uncertain tone lead to lower and more volatile stock returns for carbon-intensive firms.

To the best of our knowledge, we are the first to study how carbon emission affect the link between environmental news and stock returns in the context of Latin America and the Caribbean, a region that is highly vulnerable to the negative impacts of climate change and environmental degradation.

The rest of the paper is organized as follows. Section 2 describes the data, with special focus on our purpose-built and novel series of climate damage news. Section 3 describes our empirical strategy and presents our baseline estimations together with a battery of robustness checks. Section 4 focuses sources of heterogeneity across types of news and countries. Section 5 discusses an alternative approach (based on the event study methodology) for estimating how carbon emission intensity affects the relationship between environmental damage news and stock returns. Section 6 concludes.

2 Data

To study the link between environmental damage news and stock returns we merge four types of data: i) firm-level yearly financial data from Refinitiv Datastream; ii) firm-level daily stock returns, also from Refinitiv Datastream; iii) firm-level yearly data on carbon emission intensity from Urgentem; and iv) country-level daily count data on news related to environmental damage from the Factiva Snapshots API.

The Urgentem dataset provides firm-level annual data on emissions categorized under the Greenhouse Gas Protocol's scopes 1, 2, and 3. Scope 1 emissions measure direct emissions from sources controlled by the firm. Scope 2 emissions measures indirect emissions associated with the purchase of electricity, steam, heat, or cooling. Scope 3 emissions encompass indirect emissions in a firm's upstream and downstream value chain. Firm emissions are reported annually. Our key variable of interest is firm-level emission intensity, which is defined as the sum of scopes 1 and 2 emissions expressed in tons of carbon dioxide equivalent (tCO2e) per million dollars of revenue (tCO2e/$m revenue). Emissions data span the 2009-2022 period and cover 841 publicly-listed firms across 18 sectors in 16 countries in Latin America and the Caribbean (Figure 1). As emissions are disclosed with a one-year lag, our empirical analysis uses lagged emissions.

The Factiva Snapshots Application Programming Interface (API) retrieves specific historical articles and news based on user-defined criteria interfaced with the Dow Jones premium publication archive of over 8,500 licensed news sources. Queries are formulated using Factiva's code identifiers, which categorize articles into 2,012 regions (i.e., countries, states/provinces, municipalities, cities, economic or political unions, etc), 1,182 industries, 32 languages, 9,363 news sources, and 1,230 subjects. We use version 12.0 (updated on November 8, 2022) of the Dow Jones Intelligent Identifiers (DJID). DJID is a system developed by Dow Jones that uses a proprietary classification and taxonomy system to classify and tag the content of the Factiva business intelligence platform. Thanks to its internal consistency and standardized classification, DJIS allows us to search and retrieve data from sources that contain a vast amount of information. The identifiers are applied to Factiva using a mix of automated technologies (including Artificial Intelligence) and are then manually checked by Dow Jones' coding specialists, who ensure that the identifiers are accurate and consistent in 28 languages.

We targeted news classified under the subjects "Corporate Crime/Legal Action" and "Natural Environment." The first subject focuses on corporate crimes, legal investigations, lawsuits, and court rulings. It includes cases in which a company is either the defendant or the plaintiff. Natural environment is defined as wildlife, climate, and natural resources. The news stories we examine are about activities affecting the environment and health hazards related to environmental issues. In order to reduce the risk of picking up positive environmental news, we exclude news items which are part of the two subjects mentioned above but are sub-classified under

the subjects "carbon sequestration," "energy efficiency," and "environmental protection."[2] The search parameters also included country code, language code, and source codes for each country of interest.

After the subject classifications were set, the queries were further refined to encompass all news related to these subjects published between January 1, 2009, and December 31, 2022, at a daily frequency. We filtered for national news outlets that are constantly updated, have a daily frequency during trading days, and are categorized within Factiva as "websites: newspapers," "wires: newswires," "websites: news," or "print editions: newspapers."

After collecting data from national news outlets for the 16 countries included in the sample, we turned to regional and international outlets. To collect news from regional outlets, we used the same news producers used at the national level but included mentions of a given country in outlets of another country (for instance, we assigned to Argentina a piece of news about an Argentinean firm published in a Chilean newspaper). Our list of international outlets includes a total of 18 sources and covers four countries: the United States (Associated Press, USA Today Online, The Wall Street Journal, and The Washington Post), the United Kingdom (The Daily Express, The Daily Telegraph, The Guardian, The Independent, and The Times), Spain (ABC, El Mundo, El País, La Razón, and La Vanguardia.com), and Germany (Die Welt, Frankfurter Rundschau, Handelsblatt, and Süddeutsche Zeitung).

Before using the API for large-scale querying, we verified the precision of the queries by reading snapshots of articles extracted from the query. Factiva Professional displays 15 news articles per page. For each country, we checked that the titles and first paragraphs of the news articles on at least the first page of results accurately represented the query's intent. Next, we randomly selected 8 full articles per country from the API's news counts and carefully read them. Both exercises confirmed that our news counts captured discussion of environmental damages caused by, attributed to, or related to firm's activities, as defined in our query (see Appendix B for examples).

Note that we structured queries based on subject classifications rather than by using a keyword-search approach. This choice is dictated by the fact that keyword-based searches can yield news articles that are not directly related to environmental damages caused by firm actions.

Figure 1 plots the distribution of firms by country. As one may expect, Brazil accounts for more than one-third of the 840 firms included in our sample. The second and third largest contributors are Mexico and Chile (the top three countries account for 71% of firms), followed by Peru and Argentina. The remaining 11 countries included in our sample account for 13% of firms included in the sample.

[2]News on carbon sequestration focuses on the removal, capture, or sequestration of carbon dioxide from the atmosphere with the goal of mitigating climate change. News on energy efficiency includes actions and measures taken to promote more efficient energy use, along with tips and strategies for reducing energy consumption and research related to energy efficiency and its environmental impact. Environmental protection news concerns the protection, preservation, and conservation of the natural environment, species, and ecosystems, including efforts toward environmental restoration.

Figure 1: Number of Firms by Country

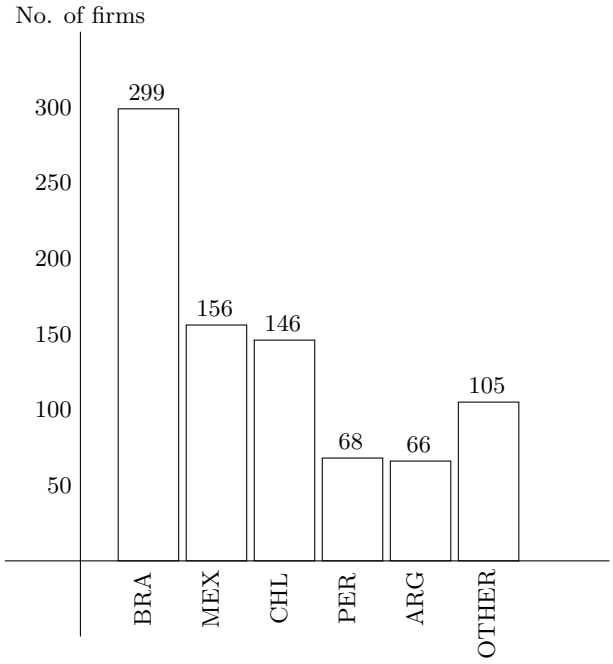


Table 1 reports summary statistics for our main variables of interests. Average daily returns are about 1.4 basis points. Average carbon emission intensity is close to 400 tons per $ million of revenues. However, the distribution is skewed, and the median value is about one-tenth of the average value. We consider two measures of News. The first is a dummy that takes value one if in a given day there is at least one news about a given country. This measure has an average value of 0.08. This indicates that the typical country has, on average, at least one environmental damage news item every 12 days. The second is the actual count which indicates that in the typical country there are about 4 environmental damage news items per month. The last three rows of the table show that the overall news count is dominated by domestic news. Tables A1-A4 in the Appendix report country-by-country summary statistics for all news, domestic news, regional news and global news.

3 Empirical Strategy and Baseline Estimations

There are two empirical challenges related to assessing whether carbon emission intensity affects the relationship between stock returns and news related to environmental damages by private corporations (henceforth, ED News).

The first challenge has to do with the source of variation of the data. While stock-returns vary across firms and are available at daily frequency, the other two key explanatory variables have more limited sources of variation. Information on ED News is available at daily frequency

Table 1: Summary Statistics

This table reports summary statistics for the main variables used in the paper. The summary statistics used the relevant source of variation. Thus, 2,595,717 observations for daily returns; 3,355 observations for carbon intensity (there are 3,355 firm-year in the sample); and 5,294 observations for news (this is the number of days in the sample).

	Mean	Median	St. Dev.	P25	P75	N. Obs.
Daily returns (basis points)	1.41	0	178.63	-32.27	29.51	2,595,717
Carbon Emissions	387.84	44.12	2806.82	10.86	282.44	3,355
News All (Dummy)	0.08	0	0.27	0	0	5,294
News All (Continuous)	0.13	0	0.53	0	0	5,294
News Domestic (Continuous)	0.1	0	0.47	0	0	5,294
News Regional (Continuous)	0.007	0	0.1	0	0	5,294
News Global (Continuous)	0.017	0	0.2	0	0	5,294

for each country included in the sample, but does not vary at firm-level. Information on carbon emission intensity, instead, is available at the firm-level but only at annual frequency. We address this challenge by interacting daily-level news with firm-level carbon emissions. In the baseline specification, we use data on carbon emission intensity for the previous year (this is because carbon emission for year y are reported in year $y+1$) and news for the previous day (the idea is that prices in day d will incorporate news released on day $d-1$; we will then show that news released on other days does not matter). Thus, our key explanatory variable is the interactive term:

$$CEI_{i(c),y-1} \times News_{c,d(y)-1}$$

where $CEI_{i(c),y-1}$ measures carbon emission intensity of firm i in year $y-1$ and $News_{c,d(y)-1}$ measures the presence of ED News about country c on day $d-1$.

Note that we collected information on different types of ED News (domestic, regional, and global; see Section 2),and we can focus on both the extensive margin (whether on a given day there is at least one piece of ED News) or the intensive margin (the number of ED News pieces). In the baseline specification, we focus on the extensive margin for all types of news and we define $News_{c,d(y)-1}$ as a dummy variable that takes value one if on day $d-1$ there was at least one piece of ED News (no matter whether this is from a domestic, regional, or global source) about country c. We will also conduct a battery of robustness checks that focus on the intensive margin and on different types of news sources.

The second challenge relates to identify the causal effect of ED news on the stock returns of emission-intensive firms. As a first step, we follow Hengge et al. (2023) and saturate the model with fixed effects that control for all possible shocks that can affect a specific firm at annual or quarterly frequency and all possible shocks that can affect overall stock market returns in country c at daily frequency. Formally, we estimate the following model:

$$R_{i(c),d(y)} = \beta CEI_{i(c),y-1} \times News_{c,d(y)-1} + \phi_{i(c),y} + \delta_{d(y),c} + \varepsilon_{i(c),d(y)} \quad (1)$$

where $R_{i(c),d(y)}$ are stock returns (in basis points) for firm i (in country c), in day d (of year t), $CEI_{i(c),y-1}$ and $News_{c,d(y)-1}$ are defined as above, $\phi_{i(c),y}$ are firm-year fixed effects (we will also use firm-quarter fixed effects), and $\delta_{d(y),c}$ are day-country fixed effects. Within this set-up, $\phi_{i(c),y}$ controls for the fact that firms with different levels of carbon intensity might have different average cross-sectional returns (see Bolton and Kacperczyk, 2021, and Bolton and Kacperczyk, 2022), and $\delta_{d(y),c}$ controls for the fact that ED News might affect overall market returns. Our parameter of interest is β, which measures whether ED News has a *differential* effect (with respect to the overall effect absorbed by $\delta_{d(y),c}$) on stock returns that depends on firm-level carbon emission intensity.

Equation 2 clarifies that our key identifying assumption is that carbon emission intensity is the only *firm-specific* variable that affects the relationship between ED News and stock returns.[3] Below we will relax this assumption and show that our results are robust to controlling for the interaction of ED news with a large number of firm level characteristics (size, turnover, profitability, leverage, and sector of operation).

Our baseline results show that β is negative and statistically significant at the one-percent confidence level (column 1, Table 2). The point estimate (-0.00094) indicates that, the day after the release of an ED News piece, stock returns for firms at the 75th percentile of carbon emission intensity (282, see Table 1) are 0.25 basis points lower than stock returns for firms at the 25th percentile of the distribution. As the average daily return in the sample is 1.4 basis points, the results indicate that after the release of ED News returns of high emission intensity firms (defined as firms at the 75th percentile of the distribution of emission intensity) are 17% lower than returns of low emission firms (defined as firms at the 25th percentile of the distribution). The left panel of Figure 2 shows how the relationship between stock returns and the release of ED News varies at different levels of carbon emission intensity.

[3] In fact, we only need the weaker assumption that there is no other variable correlated with carbon emission intensity which affects the relationship between ED News and stock returns.

Table 2: Baseline Estimations: Extensive Margin

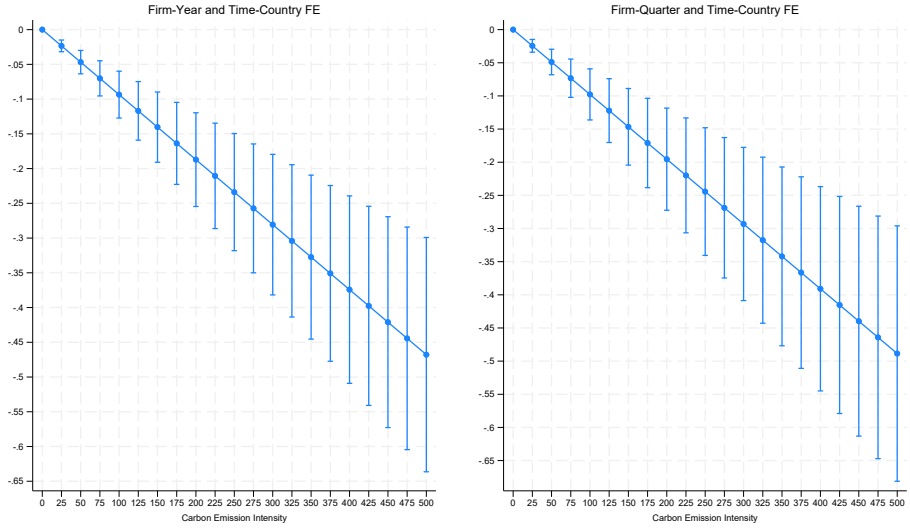
This table reports a set of regressions where the dependent variable is daily stock returns and the main control variable is the interaction between firm-level carbon emission intensity and the release of environmental damage news. $News_t$ is a dummy that takes value one if on day t there is at least one piece of ED News. Columns 1 and 4 use the specification of equation 2, columns 2-3 and 5-6 have a richer lag structure. All regressions include country-day fixed effects. The models of columns 1-3 include firm-year fixed effects and the models of columns 4-6 include firm-quarter fixed effects. The standard errors are reported in parenthesis and are clustered at the firm level

	(1)	(2)	(3)	(4)	(5)	(6)
$CEI_{y-1} \times News_{t-1}$	-0.000936***	-0.00103***	-0.00135***	-0.000977***	-0.00108***	-0.00140***
	(0.000172)	(0.000119)	(0.000181)	(0.000197)	(0.000131)	(0.000229)
$CEI_{y-1} \times News_{t}$		0.000614	0.000549		0.000631	0.000584
		(0.000465)	(0.000471)		(0.000421)	(0.000424)
$CEI_{y-1} \times News_{t+1}$		0.000437	0.000342		0.000389	0.000317
		(0.000504)	(0.000495)		(0.000439)	(0.000428)
$CEI_{y-1} \times News_{t-2}$			-1.22e-05			-4.92e-05
			(0.000680)			(0.000693)
$CEI_{y-1} \times News_{t+2}$			8.07e-05			-1.19e-06
			(0.000483)			(0.000363)
Const.	-0.0859***	0.774***	1.144***	-0.0839***	0.775***	1.147***
	(0.00831)	(0.0216)	(0.0153)	(0.00949)	(0.0182)	(0.0102)
N. Obs	856,232	698,293	645,165	856,232	698,293	645,165
R-squared	0.193	0.189	0.187	0.201	0.199	0.199
Time-country FE	✓	✓	✓	✓	✓	✓
Firm-year FE	✓	✓	✓	x	x	x
Firm-quarter FE	x	x	x	✓	✓	✓

*** p<0.01, ** p<0.05, * p<0.1

Figure 2: Stock Returns and Environmental Damage News: Marginal Effects

This figure shows how carbon emissions affect the relationship between stock returns and the release of Environmental Damage News (the vertical bars are with a 95% confidence intervals). The left panel is based on the estimations of column 1 of Table 2, and the right panel is based on the estimations of column 4 of Table 2.

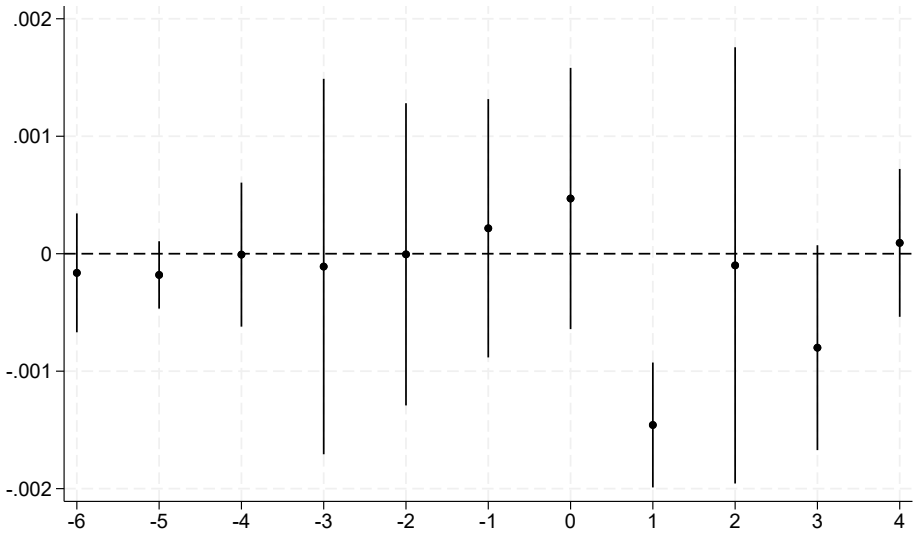


To probe further, we estimate a model that also interacts carbon emission intensity with news on day d and, to capture possible anticipation effects, the day before the news was issued (day $d+1$). We find that the interactive terms for the contemporary and early news are insignificant, while the interaction with the lagged value remains significant and with a point estimate which is slightly larger (in absolute value) than what we found in the model without the contemporary and lead interactions (see column 2 of Table 2). The results are also robust (and larger in absolute value) when we allow for two lags and leads (see column 3 of Table 2).[4]

The estimates of columns 2 and 3 of Table 2 indicate that our results are unlikely to be driven by different trends in firms with different levels of carbon intensity. To confirm that this is the case, we plot the interaction between carbon intensity and ED News for a 10-day window (from $d-6$ to $d+4$ around the release of the news, these are the same estimations of column 3 of Table 2 but with longer leads and lags) and show that there is no pre-trend. The only significant coefficient is for the day after the release of the news (Figure 3).

Figure 3: Carbon Emissions and Stock Returns around the Release of ED News

This figure plots the values of β_h obtained by estimating: $R_{i(c),d(y)} = \sum_{h=-6}^{4} \beta_h CEI_{i(c),y-1} \times News_{c,(d(y)-h)} + + \phi_{i(c),y} + \delta_{d(y),c} + \varepsilon_{i(c),d(y)}$



The regressions of first three columns of Table 2 control for firm-year fixed effects, but they do not control for firm characteristics that are reported at quarterly frequency such as size, profitability, book-to-market value, leverage, and sales growth. Rather than controlling for these variables individually, we re-estimate equation 2 by including firm-year-quarter fixed effects. This model, which implicitly controls for all quarterly data releases that are observed by

[4]Note that the number of observations decreases as we move from column 2 to column 6 because, when we estimate models with lag and leads, we exclude observations in which there are multiple events within the lag structure that we consider.

investors, yield results which are essentially identical to those obtained when we only included firm-year fixed effects. If anything, the absolute value of the point estimate of β is slightly larger when we control for firm-quarter fixed effects (compare columns 1-3 of Table 2 with columns 4-6 of the same table and also the two panels of Figure 2).

As equation 2 does not allow us to estimate the main effects of carbon emission and ED News, we also estimate a version of the model that substitute the firm-year (or firm-quarter) and country-day fixed effects, with firm and time fixed effects. The results for the interactive term corroborate the findings of Table 2, while the coefficients of the main effects are imprecisely estimated (see Appendix Table A5).

As mentioned, equation 2 implicitly assumes that carbon emission intensity is the only *firm-specific* variable that affects the relationship between ED News and stock returns. We now relax this assumption by allowing for a richer set of interactive effects and estimate the following equation:

$$R_{i(c),d(y)} = (\beta CEI_{i(c),y-1} + X_{i(c),y-1}\Gamma) \times News_{c,d(y)-1} + \phi_{i(c),y} + \delta_{d(y),c} + \varepsilon_{i(c),d(y)} \quad (2)$$

where $X_{i(c),y-1}$ is a matrix of time-varying firm characteristics that are potentially correlated with carbon emission intensity (the main effects of these variables are captured by the firm-year fixed effects $\phi_{i(c),y}$).

We start by augmenting the model with the interaction between ED news and firm size as measured by the log of total assets (in constant USD). We find that the interactive coefficient is negative and statistically significant (column 1 of Table A6). As large firms are likely to be more visible, this result is consistent with the findings of Jeon et al. (2022) that the sensitivity of stock returns is stronger for firms with high media visibility. More important for our purposes is the fact that controlling for the interaction between ED news and firm size has no effect on our parameter of interest: β remains negative, statistically significant and with a magnitude which is basically identical to that of our baseline estimates. Next, we measure firm size with log turnover and again find that large firms tend to underperform in the aftermath of ED News releases. Our parameter of interest is unchanged (column 2 of Table A6). Columns 3 and 4 of Table A6 indicate that more profitable firms (profitability is measured with the operating margin in %) perform better than the market after the release of ED news, while leverage does not matter. Again, our parameter of interest do not change after we include these controls. In column 5, we augment the model with the interaction between ED News and a rich set of sector fixed effects. This exercise sets a particularly high bar because the sector dummies absorb a substantial amount of the cross-firm variance in carbon emission. Nonetheless, our results are robust to augmenting the model with this large set of interaction. Finally, we include all the interactive effects in the same model. As before, we find that large firms tend to outperform after the release of ED News and that parameter of interest does not change (column 6 of Table A6). Results are also robust to estimating the equations of Table A6 by substituting firm-year

fixed effects with quarter-year fixed effects (see Table A6).

Next, we explore whether the result that stock returns of high carbon intensity firm underperform after the release of ED News is driven by the extensive or intensive margin. As a first step, we re-estimate the models of Table 2 by replacing the dummy that takes value one if there is at least one piece of ED News with a variable that measures the actual number of ED News in a given day. We find results that qualitatively similar to the baseline estimates (see Table 3). The point estimate of column 1 indicate that one additional ED News, is associated with stock returns for firms at the 75th percentile of carbon emission intensity are 0.12 basis points lower than stock returns for firms at the 25th percentile of the distribution (9% of average daily returns).

As expected, the point estimates obtained when using the continuous measure of news are smaller (because the average value is larger), but the standardized coefficients are basically identical (the coefficient of column 1 of Table 2 scaled by the standard deviation of the News dummy is 0.0025 and that of column 1 of Table 3 scaled by the standard deviation of number of news is 0.0023).

We also interact firm-level carbon emission intensity with both the dummy and the continuous measure of ED News. The first interaction captures the extensive margin and the second the intensive margin. We find that both coefficients are negative and that the two coefficients are jointly statistically significant (see the F tests at the bottom of Table 4). However, only the extensive margin is individually statistically significant.

Taken at face value, the point estimates of column 1 Table 4 indicate that, on days when there is exactly one ED news item, stock returns for firms at the 75th percentile of carbon emission intensity are 22 basis points lower than stock returns for firms at the 25th percentile of the distribution (16% of average daily returns); this difference increases to 29 basis points on days with 2 pieces of ED News and to 46 basis points on days with 5 pieces of ED News.

Table 3: Baseline Estimations: Intensive Margin

This table reports a set of regressions where the dependent variable is daily stock returns and the main control variable is the interaction between firm-level carbon emission intensity and the release of environmental damage news. $News_t$ measures the number of ED News released at time t. Columns 1 and 4 use the specification of equation 2, columns 2-3 and 5-6 have a richer lag structure. All regressions include country-day fixed effects. The models of columns 1-3 include firm-year fixed effects and the models of columns 4-6 include firm-quarter fixed effects. The standard errors are reported in parenthesis and are clustered at the firm level

	(1)	(2)	(3)	(4)	(5)	(6)
$CEI_{y-1} \times News_{t-1}$	-0.000442***	-0.000958***	-0.00121***	-0.000424***	-0.00104***	-0.00132***
	(0.000110)	(0.000165)	(0.000215)	(0.000107)	(0.000181)	(0.000224)
$CEI_{y-1} \times News_t$		0.000336*	0.000435		0.000335**	0.000427
		(0.000193)	(0.000380)		(0.000156)	(0.000312)
$CEI_{y-1} \times News_{t+1}$		0.000166	-1.55e-06		0.000135	-2.14e-05
		(0.000150)	(9.96e-05)		(0.000115)	(7.39e-05)
$CEI_{y-1} \times News_{t-2}$			6.76e-05			-8.59e-06
			(0.000456)			(0.000500)
$CEI_{y-1} \times News_{t+2}$			-8.56e-05			-0.000144
			(0.000283)			(0.000192)
Const.	-0.0953***	0.788***	1.157***	-0.0968***	0.791***	1.163***
	(0.00886)	(0.00980)	(0.0120)	(0.00864)	(0.00657)	(0.00750)
N. Obs.	856,232	698,293	645,165	856,232	698,293	645,165
R-squared	0.193	0.189	0.187	0.201	0.199	0.199
Time-country FE	✓	✓	✓	✓	✓	✓
Firm-year FE	✓	✓	✓	x	x	x
Firm-quarter FE	x	x	x	✓	✓	✓

*** p<0.01, ** p<0.05, * p<0.1

Table 4: Intensive versus Extensive Margin

This table reports a set of regressions where the dependent variable is daily stock returns and the main control variable is the interaction between firm-level carbon emission intensity and the release of environmental damage news. We use both a dummy that takes value one after the release of at least one ED News pieces (this variable captures the extensive margin) and a variable that measures the number of ED News pieces (intensive margin). Column 1 includes time-country and firm-year fixed effects, Column 1 includes time-country and firm-quarter fixed effects, and column 3 include firm and time fixed effects. The bottom panel of the table reports the results of a series of F-tests for the joint significance of the extensive and intensive margin. The standard errors are reported in parenthesis and are clustered at the firm level.

	(1)	(2)	(3)
$CEI_{y-1} \times News_{t-1}$ (Dummy)	-0.000607***	-0.000774***	-0.000494***
	(9.28e-05)	(9.00e-05)	(9.20e-05)
$CEI_{y-1} \times News_{t-1}$ (Continuous)	-0.000215	-0.000132	-0.000240
	(0.000142)	(0.000123)	(0.000146)
CEI_{y-1}			-5.23e-05***
			(1.28e-05)
$News_{t-1}$ (Dummy)			-1.598
			(1.026)
$News_{t-1}$ (Continuous)			1.169***
			(0.436)
Const.	-0.0844***	-0.0830***	-0.0963
	(0.00902)	(0.0101)	(0.105)
N. Obs	856,232	856,232	862,050
R-squared	0.193	0.201	0.102
Firm FE	x	x	✓
Time FE	x	x	✓
Time-country FE	✓	✓	x
Firm-year FE	✓	x	x
Firm-quarter FE	x	✓	x
F test	55.66	40.62	26.86
p value	0.000	0.000	0.00

*** p<0.01, ** p<0.05, * p<0.1

4 News and Country Heterogeneity

Having established that stocks of firms with high carbon emissions tend to underperform after the release of ED News, we now explore heterogeneity across types of news and whether the results are driven by a particular country.

As a first step, we estimate the models of columns 1 and 4 of Tables 2 and 3 separately for domestic, regional, and global news. We find that the interactive terms are always negative, but that they are statistically significant only for domestic news (see Tables A8, A9, and A10, in the Appendix; one coefficient is marginally significant in one of the four global news regression). The point estimates for the domestic news regression are similar (albeit slightly larger in absolute value) to those obtained when using all news, while the point estimates for regional and global news are marginally smaller.

Next, we run a horse race that includes interactions between firm-level carbon emissions and

the three types of news. We also find in this case that the interactive terms are always negative but that the only interaction which is statistically significant is that with domestic news (see Table 5). In fact the point estimates and standard errors are similar to those obtained when we estimated the model with one type of news at a time (compare Table 5 with Tables A8-A10).

Table 5: Horserace Regressions

This table reports a set of regressions where the dependent variable is daily stock returns and the main control variable is the interaction between firm-level carbon emission intensity and the release of environmental damage news from three sources: Domestic newspapers and magazines, Regional newspapers and magazines, and Global newspapers and magazines. All regressions include country-day fixed effects. The models of columns 1 and 4 include firm-year fixed effects and the models of columns 2 and 4 include firm-quarter fixed effects. Columns 1 and 2 use a dummy that takes value one after the release of at least one ED News. Columns 3 and 4 use a measure of the number of ED news. The standard errors are reported in parenthesis and are clustered at the firm level

	(1)	(2)	(3)	(4)
$CEI_{y-1} \times DomesticNews_{t-1}$	-0.000963***	-0.000978***	-0.000425***	-0.000398**
	(0.000307)	(0.000315)	(0.000159)	(0.000156)
$CEI_{y-1} \times RegionalNews_{t-1}$	-0.000611	-0.000682	-0.000637	-0.000722
	(0.000839)	(0.000780)	(0.000685)	(0.000637)
$CEI_{y-1} \times WorldNews_{t-1}$	-0.000783	-0.000892	-0.000727	-0.000814
	(0.000494)	(0.000608)	(0.000469)	(0.000558)
Const.	-0.0841***	-0.0828***	-0.0947***	-0.0960***
	(0.0112)	(0.0121)	(0.00972)	(0.0101)
N. Obs.	856,232	856,232	856,232	856,232
R-squared	0.193	0.201	0.193	0.201
Time-country FE	✓	✓	✓	✓
Firm-year FE	✓	x	✓	x
Firm-quarter FE	x	✓	x	✓
News is	Dummy	Dummy	Continuous	Continuous

Robust standard errors clustered at firm level in parentheses
*** p<0.01, ** p<0.05, * p<0.1

One possible source of concerns is that our sample is dominated by a small number of large countries. Brazilian firms account for 43% of the observations, and the top three countries (Brazil, Mexico, and Chile) account for 77% of observations. To make sure that the observations are not driven by an individual country or by a small set of countries, we re-estimate the baseline regressions by weighing each observation by the inverse of the number of observations in that specific country. Thus, each observation involving Brazilian firms has a weight of $\frac{1}{368,215}$, and each observation involving Panamanian firms has a weight of $\frac{1}{5925}$. With this weighting scheme, each country has exactly the same weight. The results, reported in Table 6, are essentially identical to the baseline findings of Tables 2 and 3. They thus confirm that our findings are not driven by a particular country or group of countries with a large number of firms.

As a further robustness check we re-estimate the baseline model (with and without inverse country weights) by dropping one country at a time. The results confirm that the findings are not driven by just one influential country (see Appendix Table A11). The point estimates become smaller (but still statistically significant at the 1 percent confidence level) when we

exclude Brazil and larger when we exclude Mexico (this is the country with the second largest number of observations, corresponding to 19% of the total).

We also estimate country-by-country regressions for the 6 countries with the largest number of observations (Argentina, Brazil, Chile, Colombia, Mexico, and Peru). We find that the coefficient of interest is negative and statistically significant (or very close to being statistically significant in the case of Argentina) in four countries, negative but far from being statistically significant in Colombia and positive but close to zero in Chile (Appendix Table A12).

Table 6: Weighted Regressions

This table reports a set of regressions where the dependent variable is daily stock returns and the main control variable is the interaction between firm-level carbon emission intensity and the release of environmental damage news. All regressions include country-day fixed effects. The models of columns 1 and 4 include firm-year fixed effects and the models of columns 2 and 4 include firm-quarter fixed effects. Columns 1 and 2 use a dummy that takes value one after the release of at least one ED News piece. Columns 3 and 4 use a measure of the number of ED News pieces. Each observation is weighted by the inverse of the number of observations in its specific country. The standard errors are reported in parenthesis and are clustered at the firm level

	(1)	(2)	(3)	(4)
$CEI_{y-1} \times News_{t-1}$	-0.000868***	-0.000887***	-0.000372**	-0.000352**
	(0.000208)	(0.000236)	(0.000144)	(0.000142)
Const.	1.184***	1.184***	1.178***	1.178***
	(0.00417)	(0.00471)	(0.00463)	(0.00455)
N. Obs	856,232	856,232	856,232	856,232
R-squared	0.287	0.294	0.287	0.294
Time-country FE	✓	✓	✓	✓
Firm-year FE	✓	x	✓	x
Firm-quarter FE	x	✓	x	✓
News is	Dummy	Dummy	Continuous	Continuous

Robust standard errors in parenthesis clustered at the firm level
*** p<0.01, ** p<0.05, * p<0.1

5 Event Study

As an alternative method to study how environmental damage news affect carbon intensive firms, we use a two-step event-study approach. In the first step, we conduct a classic event study and compute abnormal returns around the release of environmental damage news for all firms in our sample. In the second step, we look at the relationship between these abnormal returns and carbon emission intensity.

To estimate abnormal returns associated with environmental damages news released on day T, we start by estimating the following regression for a 57 trading days window that starts at time $T-60$ and ends at time $T-3$:

$$r_{i(c),d} = \alpha + \beta m_{c,d} + u_{i(c),d} \tag{3}$$

where $r_{i(c),d}$ is the daily return of firm i (based in country c) on day d and $m_{c,d}$ is the market return in country c on day d.

Unlike most event studies, we have several events which are close to each other (as discussed in the data section, on average, we have more than two events per month). The problem with having events close to each other is that they contaminate the estimation window (in the typical event study there should no events in the estimation window). Consider, for instance, a situation in which there is one event on April 15 and one event on May 20. The estimation window for the first event starts in mid January (approximately 12 weeks before the event) and ends on April 13, and the estimation window for the second event starts in mid February and ends on May 17. There is thus a substantial overlap between the two estimation windows and the event of April 15 could affect the parameter estimates used to compute the excess returns for the May 20 event. In our case, the problem is even worse, as we have many cases with estimations windows that include multiple events.

One way to address this problem is to exclude all cases in which there are events which overlap with another event's estimation window. The problem with this strategy is that we would end up with a very small number of events. As an intermediate strategy, we allow for some overlap. Specifically, we include in our sample events with a maximum overlap of 10 days and exclude events with longer overlaps.[5]. This strategy yields a sample of 28,461 firm-events.

We then use the parameter estimates of equation 3 to obtain excess ("abnormal") returns as out-of-sample forecast error over a 5-day event window that starts at $T-2$ and ends at $T+2$:

$$ar_{i(c),d} = r_{i(c),d} - (\hat{\alpha} + \hat{\beta} m_{c,d}) \tag{4}$$

and compute average accumulated average abnormal returns for event E as:

$$AAR_{i(c),E} = \frac{1}{5} \sum_{d=T-2}^{T+2} ar_{i(c),d}. \tag{5}$$

The ratio $\frac{AAR}{\sigma_{ar}\sqrt{5}}$ (where σ_{ar} is the standard deviation of $\hat{u}_{i(c),d}$ in the estimation window) is a t-test on AAR.

As some of our estimates yield very large excess return, we trim our data at 5 percent of the abnormal return variable, and we are left with a sample of 25,615 firm-events with average excess returns that range between -1,500 and 1,500 basis points. Nearly 20,000 (77 percent of the total) of these estimated excess returns are not statistically significant, 2,869 (11 percent of the total) are positive and statistically significant at the 5 percent confidence level, and 3,077 (12 percent of the total) are negative and statistically significant.

Having built our sample of firm-event abnormal returns, we are now ready to test whether carbon-intensive firms are more likely to experience negative abnormal returns around release

[5] We explore with different maximum overlaps and obtain similar results

of environmental damages news.[6] We start by regressing abnormal returns over the log of carbon emission intensity and find a negative but not statistically significant coefficient (column 1 of Table 7). Lack of significance could be due to the fact that our dependent variable is imprecisely estimated (77 percent of observations are not statistically significant, often because of large confidence interval). One possible solution would be to concentrate the analysis on statistically significant returns. However, it would be arbitrary to include an observation with a t-test of, say, 1.97 and exclude an observation with a t-test of 1.95. As an alternative, we rescale our t-test to range between 0 and 1 and weight each observation by its own t-test. In this way we give more weight to precisely estimated abnormal returns and less weight to abnormal returns with a large confidence interval. The weighted regressions show a much stronger and statistically significant negative relationship between carbon emission intensity and abnormal returns. The point estimate indicate that a 1 percent increase in carbon emission intensity is associated with a 242 basis points decrease in abnormal returns in the days that surround the release of environmental damage news (column 2 of Table 7). The results are robust to substituting the log of carbon emissions with the level of carbon emissions (column 3 of Table 7). We find qualitatively similar results when we augment the model with country and event fixed effects (columns 4 and 5 of Table 7). However, controlling for fixed effects reduces the magnitude of the effect of carbon emission intensity on abnormal returns. The point estimates now suggest that a one percent increase in carbon emissions is associated with a 65 basis points decrease in abnormal returns on the 5 days that surround the release of environmental damages news.

To probe further, we use two non-parametric approaches to allow for non-linearities in the relationship between abnormal returns and carbon emission intensity. We first compute average abnormal returns at different points in the distribution of carbon emissions. Specifically, we compute t-test weighted average abnormal returns for all firms in the bottom 10 percent of the distribution of carbon emissions, and we then move to firms in the bottom 20, 30, 40 and 50 percent of the distribution of carbon emissions. We also compute average abnormal returns for firms in the top 50, 60, 70, 80 and 90 percent of the distribution of carbon emissions.[7] Figure 4 plots the average values with their corresponding 95 percent confidence intervals and shows that firms in the bottom part of the distribution of carbon emission tend to have positive abnormal returns, while firms in the upper part of the distribution (and this is especially the case for firms in the top 20th and 10th percentile) tend to have negative abnormal returns.

[6] In order to avoid focusing on firms with extreme values of carbon emissions, we also trim carbon emissions at 5 percent. We are left with a sample of 23,119 firm-events. Of these firm-events, 5,327 (23 percent of the total) have statistically significant abnormal returns, 2,560 firm-events (11 percent of the total) have positive and statistically significant abnormal returns, and 2,767 (12 percent of the total) have negative and statistically significant abnormal returns.

[7] In practice, we run t-test-weighted regressions with no controls on different sub-samples and report the constant and its 95 percent confidence interval.

Table 7: Abnormal Returns and Carbon Emissions

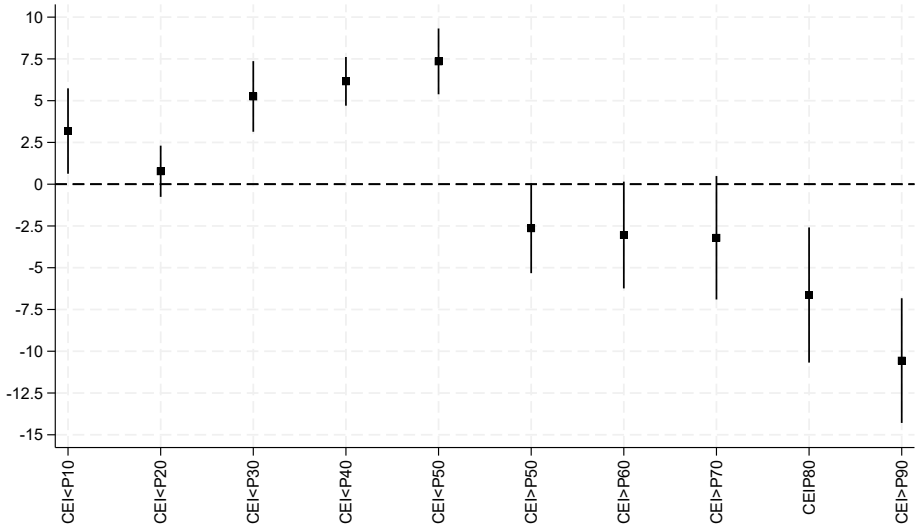
This table plots the result of a set of regression in which abnormal returns are regressed on firm-year level carbon emissions. The regressions of columns 2-5 are weighted by the absolute value of abnormal return t-statistics rescaled to range between 0 and 1. The regressions of columns 4-5 include country and event fixed effects.

	(1)	(2)	(3)	(4)	(5)
$ln(CEI)$	-0.209	-2.419**		-0.649**	
	(0.240)	(1.057)		(0.220)	
CEI			-0.017***		-0.005**
			(0.004)		(0.0018)
Constant	-2.478**	12.30***	6.082***	5.112***	3.556***
	(1.021)	(3.990)	(1.621)	(0.883)	(0.382)
N. Obs	23,119	23,119	23,119	23,058	23,058
R2	0.000	0.018	0.030	0.289	0.289
Weights	x	✓	✓	✓	✓
Country Fixed Effects	x	x	x	✓	✓
Event Fixed effects	x	x	x	✓	✓

Robust standard errors in parenthesis clustered at country and event level
*** p<0.01, ** p<0.05, * p<0.1

Figure 4: Average Abnormal Returns at Different Levels of Carbon Emissions

This figure plots average abnormal returns with 95% confidence intervals for subsamples of firms at different levels of carbon emissions. CEI<P10 plots average abnormal returns for firms in the bottom 10% of the distribution of carbon emission intensity; CEI<P20 plots average abnormal returns for firms in the bottom 20% of the distribution of carbon emission intensity, and so on for CEI<P30, CEI<P40, and CEI<P50. CEI>P50 plots average abnormal returns for firms in the top 50% of the distribution of carbon emission intensity, CEI>P60 plots average abnormal returns for firms in the top 60% of the distribution of carbon emission intensity, and so on for CEI>P70, CEI>P80, CEI>P90. All averages are weighted by the absolute value of abnormal return t-statistics rescaled to range between 0 and 1.



We also estimate a series of regressions using dummies that take value one at different points of the distribution of carbon emissions. For instance, the regression reported in column 1 of Table

8 includes a dummy that take value one for all firms in the bottom 10 percent of the distribution of carbon emission and value 0 for all other firms. Similarly, the regression of column 2 uses a dummy that takes value one for all the firms in the bottom 20 percent in the distributions. Columns 3 and 4 focus on the different extreme of the distribution and use dummies that take value 1 for firms in the top 20 and 10 percent of the distribution of carbon emissions. Columns 5 and 10 jointly include the bottom 10 percent and top 10 percent dummies.

The interpretation of the regressions of Table 8 is different from that of the average values of Figure 4. In the latter case, we are looking at average values in different points of the distribution of carbon emission intensity. In the former, we are testing for the difference of average values at different points of the distribution. For instance, the point estimates of column 1 in Table 8 tell us that average abnormal returns around the release of environmental damage news of firms in the bottom 10 percent of the distribution of carbon emission intensity are 75 basis points higher than abnormal returns in the remaining 90 percent of firms, but the difference is not statistically significant. Columns 3 and 4, instead, indicate that abnormal returns are significantly lower for firms in the top 20 and 10 percent of the distribution of carbon emission intensity (the difference is 1,200 and 1,500 basis points, respectively). Column 5 shows that abnormal returns for firms in the bottom 10 percent of the distribution of carbon emission intensity are higher (but not significantly higher) than those of firms at the 10th-90th percentile of the distribution of carbon emission intensity and abnormal returns for firms in the top 10 percent are significantly lower than those of firms at the 10th-90th percentile of the distribution of carbon emission intensity.

Columns 6-10 of Table 8 are qualitatively similar when we control for country and event fixed effects. However, controlling for these variables results in lower point estimates. For instance, the difference in abnormal returns between firms in the top 10th percentile and firms in the bottom 90th percentile goes from 1,500 to 400 basis points.

Table 8: Abnormal Returns and Carbon Emission Dummies

This table plots the result of a set of regression in which abnormal returns are regressed on firm-year level dummies that take value one for different levels of carbon emissions. For instance, CEI<P10 is a dummy that takes value one for firms in the bottom 10 percentile of carbon emissions and CEI>P90 is a dummy that takes value one for firms in the top 10 percentile of carbon emissions. All regressions are weighted by the absolute value of abnormal return t-statistics rescaled to range between 0 and 1. The regressions of columns 5-8 include country and event fixed effects.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
P10	0.754				-1.328	0.326				0.161
	(3.523)				(3.038)	(1.049)				(1.013)
P20		-1.979					-1.668			
		(3.026)					(1.858)			
P80			-11.81***					-3.105**		
			(4.338)					(1.039)		
P90				-14.96***	-15.07***				-4.085***	-4.076***
				(4.036)	(4.078)				(1.091)	(1.119)
Constant	2.428	2.753	5.180***	4.404***	4.510***	2.454***	2.706***	3.186***	3.002***	2.989***
	(2.425)	(2.608)	(1.570)	(1.537)	(1.644)	(0.0758)	(0.256)	(0.234)	(0.144)	(0.196)
N. Obs	23,119	23,119	23,119	23,119	23,119	23,058	23,058	23,058	23,058	23,058
R2	0.000	0.000	0.024	0.025	0.025	0.289	0.289	0.289	0.289	0.289
Country FE	x	x	x	x	x	✓	✓	✓	✓	✓
Event FE	x	x	x	x	x	✓	✓	✓	✓	✓

Robust standard errors in parentheses clustered at the country and event level
*** p<0.01, ** p<0.05, * p<0.1

6 Conclusions

This study provides evidence that news related to environmental damages significantly influences stock returns, particularly for firms with high carbon emission intensity in Latin America and the Caribbean. The primary conclusion drawn from this analysis is that the release of environmental damage news disproportionately and negatively affects firms with a higher carbon footprint compared to those with a lower one. This finding underscores the increasing sensitivity of the market to environmental performance, reflecting growing investor awareness and concern about environmental risks and their financial implications.

Further, the study highlights the critical role of transparent and timely environmental reporting in shaping investor behavior. As the financial market reacts swiftly to news of environmental harm, it becomes salient for firms, especially those with high carbon intensity, to adopt more sustainable practices and reduce their environmental impact. This shift not only mitigates potential reputational and financial risks but also aligns with global efforts to combat climate change.

The results also have significant implications for policymakers. They underscore the need for environmental regulations and policies that incentivize firms to reduce their carbon emissions. Such policies could include carbon taxes, emission trading schemes, and subsidies for green technologies. In addition, enhancing the disclosure requirements related to environmental impacts could further sensitize the market to these issues, leading to more environmentally responsible investment decisions. Future research could extend this analysis to other regions, examine the long-term effects of environmental news on stock returns, and explore the impact of different types of environmental news.

In conclusion, this study contributes to our understanding of the interplay between environmental performance and financial valuation. It highlights the increasing importance of environmental considerations in the financial market and offers insights for investors, firms, and policymakers in navigating the challenges of integrating environmental risks into financial decision-making.

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Appendix A: Additional Tables and Figures

Table A1: News By Country (All News)

This table reports country-by-country summary statistics for the All News variable.

Country	Mean	St. Dev	N. Obs
Argentina	0.02323	0.17610	5,294
Bahamas	0.00057	0.02380	5,294
Brazil	0.25123	0.76380	5,294
Chile	0.08406	0.42445	5,294
Colombia	0.01133	0.12990	5,294
Costa Rica	0.00189	0.04342	5,294
Dominican Republic	0.00038	0.02749	5,294
Ecuador	0.01492	0.14664	5,294
Honduras	0.00302	0.05824	5,294
Jamaica	0.00076	0.03366	5,294
Mexico	0.12939	0.54884	5,294
Panama	0.00586	0.08564	5,294
Peru	0.02928	0.24759	5,294
Trinidad and Tobago	0.00019	0.01374	5,294
Uruguay	0.00094	0.03072	5,294
Venezuela	0.00699	0.09596	5,294
Total	0.03318	0.27554	89,998

Table A2: News By Country (Domestic News)

This table reports country-by-country summary statistics for the Domestic News variable.

Country	Mean	St. Dev	N. Obs
Argentina	0.0153	0.14001	5,294
Bahamas	0.0000	0.00000	5,294
Brazil	0.2306	0.73397	5,294
Chile	0.0803	0.40795	5,294
Colombia	0.0060	0.08887	5,294
Costa Rica	0.0017	0.04120	5,294
Dominican Republic	0.0000	0.00000	5,294
Ecuador	0.0004	0.01943	5,294
Honduras	0.0002	0.01374	5,294
Jamaica	0.0000	0.00000	5,294
Mexico	0.0701	0.37768	5,294
Panama	0.0051	0.07636	5,294
Peru	0.0089	0.10339	5,294
Trinidad and Tobago	0.0000	0.00000	5,294
Uruguay	0.0004	0.01943	5,294
Venezuela	0.0002	0.01374	5,294
Total	0.0247	0.23628	89,998

Table A3: News By Country (Regional News)

This table reports country-by-country summary statistics for the Regional News variable.

Country	Mean	St. Dev	N. Obs
Argentina	0.00472	0.08347	5,294
Bahamas	0.00000	0.00000	5,294
Brazil	0.00869	0.10788	5,294
Chile	0.00227	0.05827	5,294
Colombia	0.00491	0.08000	5,294
Costa Rica	0.00019	0.01374	5,294
Dominican Republic	0.00000	0.00000	5,294
Ecuador	0.00359	0.05981	5,294
Honduras	0.00113	0.03365	5,294
Jamaica	0.00000	0.00000	5,294
Mexico	0.02229	0.16343	5,294
Panama	0.00076	0.02748	5,294
Peru	0.01284	0.17009	5,294
Trinidad and Tobago	0.00019	0.01374	5,294
Uruguay	0.00019	0.01374	5,294
Venezuela	0.00378	0.06436	5,294
‘ Total	0.00386	0.07466	89,998

Table A4: News By Country (World News)

This table reports country-by-country summary statistics for the World News variable.

Country	Mean	St. Dev	N. Obs
Argentina	0.00321	0.06291	5,294
Bahamas	0.00057	0.02380	5,294
Brazil	0.01190	0.12765	5,294
Chile	0.00151	0.04344	5,294
Colombia	0.00038	0.01943	5,294
Costa Rica	0.00000	0.00000	5,294
Dominican Republic	0.00038	0.02749	5,294
Ecuador	0.01096	0.12700	5,294
Honduras	0.00170	0.04556	5,294
Jamaica	0.00076	0.03366	5,294
Mexico	0.03702	0.26251	5,294
Panama	0.00000	0.00000	5,294
Peru	0.00756	0.10620	5,294
Trinidad and Tobago	0.00000	0.00000	5,294
Uruguay	0.00038	0.01943	5,294
Venezuela	0.00302	0.06440	5,294
Total	0.00467	0.08718	89,998

Table A5: Estimations with Main Effects

This table reports a set of regressions where the dependent variable is daily stock returns and the main control variables are firm-year level carbon emissions, country-day-levels ED News, and the interaction between these two variables. Columns 2 and 3 also include a richer lag structure. All regressions include firm and time fixed effects. The standard errors are reported in parenthesis and are clustered at the firm level.

	(1)	(2)	(3)
$CEI_{y-1} \times News_{t-1}$	-0.000866***	-0.000834***	-0.00123***
	(0.000199)	(0.000143)	(0.000196)
CEI_{y-1}	-5.20e-05***	-6.00e-05	-5.39e-05
	(1.29e-05)	(7.58e-05)	(5.45e-05)
$News_{t-1}$	0.434	-0.933	-4.242***
	(0.725)	(1.112)	(1.304)
$CEI_{y-1} \times News_{t}$		0.000601	0.000558
		(0.000464)	(0.000499)
$CEI_{y-1} \times News_{t+1}$		0.000382	0.000337
		(0.000456)	(0.000458)
$News_{t}$		5.553***	3.833***
		(1.150)	(1.271)
$News_{t+1}$		4.899***	3.527***
		(1.024)	(1.169)
$CEI_{y-1} \times News_{t-2}$			0.000206
			(0.000746)
$CEI_{y-1} \times News_{t+2}$			8.13e-05
			(0.000552)
$News_{t-2}$			-6.661***
			(1.330)
$News_{t+2}$			-3.560***
			(1.373)
Const.	-0.0975	0.223*	1.431***
	(0.105)	(0.127)	(0.158)
N. Obs	862,050	704,073	650,929
R-squared	0.102	0.100	0.098
Firm FE	✓	✓	✓
Time FE	✓	✓	✓

*** p<0.01, ** p<0.05, * p<0.1

Table A6: Multiple Firm-Level Interactions (firm-year FE)

The sectors are: Accommodation and food (S1); Administration and Support (S2); Agriculture, forestry and fishing (S3); Construction (S4); Education (S5); Electricity, gas and steam (S6); Entertainment (S7); Financial and insurance (S8); Health and social work (S9); Information and communication (S10); Manufacturing (S11); Mining (S12); Professional and technical (S13); Public administration (S14); Real estate (S15); Transport and storage (S16); Water, sewage, and water management (S17); Wholesale and retail (excluded group).

	(1)	(2)	(3)	(4)	(5)	(6)
$CEI_{y-1} \times News_{t-1}$	-0.0009***	-0.0009***	-0.0009***	-0.0009***	-0.0009***	-0.0009***
	(0.00017)	(0.00017)	(0.00017)	(0.00018)	(0.00018)	(0.00020)
$ln(Assets_{y-1}) \times News_{t-1}$	-1.414***					-2.474***
	(0.352)					(0.868)
$ln(Turn_{y-1}) \times News_{t-1}$		-0.982***				0.977
		(0.350)				(0.850)
$Op.\,Marg._{y-1} \times News_{t-1}$			0.00019***			1.61e-05
			(0.00001)			(0.0006)
$Leverage_{y-1} \times News_{t-1}$				-0.00306		-0.00290
				(0.0114)		(0.0118)
$S1 \times News_{t-1}$					1.290	0.166
					(4.525)	(4.980)
$S2 \times News_{t-1}$					3.855	7.802
					(4.492)	(4.965)
$S3 \times News_{t-1}$					-9.716*	-7.952
					(5.688)	(5.119)
$S4 \times News_{t-1}$					2.446	3.546
					(3.362)	(3.530)
$S5 \times News_{t-1}$					5.538	6.296
					(5.547)	(5.791)
$S6 \times News_{t-1}$					-2.156	-0.658
					(2.711)	(3.035)
$S7 \times News_{t-1}$					-1.339	-2.835
					(5.986)	(5.978)
$S8 \times News_{t-1}$					-2.197	2.443
					(2.771)	(3.398)
$S9 \times News_{t-1}$					-2.837	-4.510
					(4.263)	(5.075)
$S10 \times News_{t-1}$					2.253	4.201
					(3.511)	(3.756)
$S11 \times News_{t-1}$					-0.216	-0.233
					(2.666)	(2.742)
$S12 \times News_{t-1}$					1.590	2.837
					(3.469)	(3.884)
$S13 \times News_{t-1}$					-4.192	-3.135
					(4.568)	(5.791)
$S14 \times News_{t-1}$					-3.801	-4.936*
					(2.678)	(2.809)
$S15 \times News_{t-1}$					4.061	5.797
					(3.215)	(4.143)
$S16 \times News_{t-1}$					0.392	2.785
					(3.853)	(4.200)
$S17 \times News_{t-1}$					1.763	5.934*
					(3.586)	(3.355)
N. Obs	794,286	785,416	782,125	761,958	856,232	753,871
R-squared	0.205	0.205	0.205	0.210	0.193	0.209
Time-country FE	✓	✓	✓	✓	✓	✓
Firm-year FE	✓	✓	✓	✓	✓	✓

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A7: Multiple Firm-Level Interactions (firm-quarter FE)

The sectors are: Accommodation and food (S1); Administration and Support (S2); Agriculture, forestry and fishing (S3); Construction (S4); Education (S5); Electricity, gas and steam (S6); Entertainment (S7); Financial and insurance (S8); Health and social work (S9); Information and communication (S10); Manufacturing (S11); Mining (S12); Professional and technical (S13); Public administration (S14); Real estate (S15); Transport and storage (S16); Water, sewage, and water management (S17); Wholesale and retail (excluded group).

	(1)	(2)	(3)	(4)	(5)	(6)
$CEI_{y-1} \times News_{t-1}$	-0.0009***	-0.001***	-0.001***	-0.001***	-0.001***	-0.0009***
	(0.0002)	(0.0002)	(0.0002)	(0.00019)	(0.00021)	(0.00022)
$ln(Assets_{y-1}) \times News_{t-1}$	-1.243***					-2.372***
	(0.363)					(0.883)
$ln(Turn_{y-1}) \times News_{t-1}$		-0.840**				1.048
		(0.353)				(0.876)
$Op.\,Marg._{y-1} \times News_{t-1}$			0.00014**			-0.000165
			(0.00001)			(0.00067)
$Leverage_{y-1} \times News_{t-1}$				-0.00614		-0.00572
				(0.0111)		(0.0115)
$S1 \times News_{t-1}$					1.180	0.184
					(4.850)	(5.306)
$S2 \times News_{t-1}$					2.103	6.421
					(4.582)	(5.136)
$S3 \times News_{t-1}$					-8.903	-6.845
					(5.480)	(4.802)
$S4 \times News_{t-1}$					2.725	4.104
					(3.358)	(3.483)
$S5 \times News_{t-1}$					3.822	4.776
					(5.555)	(5.833)
$S6 \times News_{t-1}$					-1.748	-0.176
					(2.719)	(3.024)
$S7 \times News_{t-1}$					-3.334	-4.286
					(5.111)	(5.178)
$S8 \times News_{t-1}$					-1.789	2.936
					(2.751)	(3.328)
$S9 \times News_{t-1}$					-2.580	-3.875
					(4.760)	(5.561)
$S10 \times News_{t-1}$					3.828	5.928
					(3.408)	(3.631)
$S11 \times News_{t-1}$					0.587	0.738
					(2.643)	(2.707)
$S12 \times News_{t-1}$					3.877	5.547
					(3.525)	(3.982)
$S13 \times News_{t-1}$					-4.058	-3.553
					(4.495)	(6.231)
$S14 \times News_{t-1}$					-6.109**	-7.181**
					(2.695)	(2.803)
$S15 \times News_{t-1}$					4.728	6.754
					(3.221)	(4.126)
$S16 \times News_{t-1}$					0.544	3.276
					(3.935)	(4.225)
$S17 \times News_{t-1}$					1.536	5.610
					(3.796)	(3.859)
N. Obs	794,286	785,416	782,125	761,958	856,232	753,871
R-squared	0.213	0.214	0.214	0.218	0.201	0.217
Time-country FE	✓	✓	✓	✓	✓	✓
Firm-quarter FE	✓	✓	✓	✓	✓	✓

Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Table A8: Domestic News

This table reports a set of regressions where the dependent variable is daily stock returns and the main control variable is the interaction between firm-level carbon emission intensity and the release of environmental damage news in domestic newspapers and magazines. All regressions include country-day fixed effects. The models of columns 1 and 4 include firm-year fixed effects and the models of columns 2 and 4 include firm-quarter fixed effects. Columns 1 and 2 use a dummy that takes value one after the release of at least one ED News piece. Columns 3 and 4 use a measure of the number of ED News pieces. The standard errors are reported in parenthesis and are clustered at the firm level.

	(1)	(2)	(3)	(4)
$CEI_{y-1} \times News_{t-1}$	-0.000977***	-0.000992***	-0.000427***	-0.000399***
	(0.000254)	(0.000262)	(0.000148)	(0.000145)
Const.	-0.0882***	-0.0875***	-0.100***	-0.102***
	(0.0111)	(0.0115)	(0.0108)	(0.0106)
N. Obs	856,232	856,232	856,232	856,232
R-squared	0.193	0.201	0.193	0.201
Time-country FE	✓	✓	✓	✓
Firm-year FE	✓	x	✓	x
Firm-quarter FE	x	✓	x	✓
News is	Dummy	Dummy	Continuous	Continuous

*** p<0.01, ** p<0.05, * p<0.1

Table A9: Regional News

This table reports a set of regressions where the dependent variable is daily stock returns and the main control variable is the interaction between firm-level carbon emission intensity and the release of environmental damage news in regional newspapers and magazines. All regressions include country-day fixed effects. The models of columns 1 and 4 include firm-year fixed effects and the models of columns 2 and 4 include firm-quarter fixed effects. Columns 1 and 2 use a dummy that takes value one after the release of at least one ED News piece. Columns 3 and 4 use a measure of the number of ED News pieces. The standard errors are reported in parenthesis and are clustered at the firm level.

	(1)	(2)	(3)	(4)
$CEI_{y-1} \times News_{t-1}$	-0.000771	-0.000832	-0.000675	-0.000756
	(0.000863)	(0.000818)	(0.000724)	(0.000676)
Const.	-0.128***	-0.128***	-0.128***	-0.127***
	(0.00373)	(0.00354)	(0.00355)	(0.00331)
N. Obs	856,232	856,232	856,232	856,232
R-squared	0.193	0.201	0.193	0.201
Time-country FE	✓	✓	✓	✓
Firm-year FE	✓	x	✓	x
Firm-quarter FE	x	✓	x	✓
News is	Dummy	Dummy	Continuous	Continuous

Robust standard errors clustered at firm-level in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A10: Global News

This table reports a set of regressions where the dependent variable is daily stock returns and the main control variable is the interaction between firm-level carbon emission intensity and the release of environmental damage news in global newspapers and magazines. All regressions include country-day fixed effects. The models of columns 1 and 4 include firm-year fixed effects, and the models of columns 2 and 4 include firm-quarter fixed effects. Columns 1 and 2 use a dummy that takes value one after the release of at least one ED News piece. Columns 3 and 4 use a measure of the number of ED News pieces. The standard errors are reported in parenthesis and are clustered at the firm level.

	(1)	(2)	(3)	(4)
$CEI_{y-1} \times News_{t-1}$	-0.000690*	-0.000817	-0.000672	-0.000780
	(0.000417)	(0.000524)	(0.000421)	(0.000514)
Const.	-0.129***	-0.129***	-0.129***	-0.129***
	(0.00113)	(0.00142)	(0.00133)	(0.00162)
N. Obs.	856,232	856,232	856,232	856,232
R-squared	0.193	0.201	0.193	0.201
Time-country FE	✓	✓	✓	✓
Firm-year FE	✓	x	✓	x
Firm-quarter FE	x	✓	x	✓
News is	Dummy	Dummy	Continuous	Continuous

Robust standard errors clustered at firm-level in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Table A11: Regression Results with Country Exclusions

This table reports the coefficients and t-statistics of the interaction between firm-level carbon emission intensity and the release of environmental damage news using the same models as column 4 of Table 2 and column 2 of Table 6 but by dropping one country at a time.

Excluded	Not Weighted		Weighted		
Country	Coefficient	t statistics	Coefficient	t statistics	N. Obs
Argentina	-0.0010	4.691 ***	-0.0008	3.292 ***	4,102,850
Bahamas	-0.0010	4.975 ***	-0.0009	3.768 ***	4,441,666
Brazil	-0.0005	3.303 ***	-0.0005	2.608 **	2,869,348
Chile	-0.0010	5.262 ***	-0.0009	3.900 ***	3,679,330
Colombia	-0.0010	4.947 ***	-0.0009	3.680 ***	4,251,082
Costa Rica	-0.0010	4.974 ***	-0.0009	3.767 ***	4,441,666
Dominican Republic	-0.0010	4.973 ***	-0.0009	3.766 ***	4,446,960
Ecuador	-0.0010	4.983 ***	-0.0009	4.105 ***	4,436,372
Honduras	-0.0010	4.973 ***	-0.0009	3.766 ***	4,446,960
Jamaica	-0.0010	4.973 ***	-0.0009	3.766 ***	4,304,022
Mexico	-0.0012	18.62 ***	-0.0012	10.15 ***	3,626,390
Panama	-0.0010	4.976 ***	-0.0009	3.787 ***	4,394,020
Peru	-0.0010	4.876 ***	-0.0009	3.584 ***	4,092,262
Trinidad and Tobago	-0.0010	4.971 ***	-0.0009	3.741 ***	4,372,844
Uruguay	-0.0010	4.973 ***	-0.0009	3.766 ***	4,446,960
Venezuela	-0.0010	4.974 ***	-0.0009	3.774 ***	4,436,372

Table A12: Country by Country Regressions

This table reports the coefficients and t-statistics of the interaction between firm-level carbon emission intensity and the release of environmental damage news based on country-by-country regressions using the same models as column 4 of Table 2 but with time fixed effects instead of country-time fixed effects.

Country	Coefficient	p value
Argentina	-0.0131	0.108
Brazil	-0.0012	0.000
Chile	0.0001	0.909
Colombia	-0.0030	0.479
Mexico	-0.0004	0.013
Peru	-0.0025	0.099

Appendix B: Factiva Professional News Examples

B1: Review of the Top 15 News Results Obtained from our Selected Query Code in Factiva Professional

Figure A1: Domestic News for Chile

The selected query topic filter is: ((‘Natural Environment’ and ‘Corporate Crime/Legal Action’) and not (‘Carbon Sequestration’ or ‘Energy Efficiency’ or ‘Environmental Protection’)) Filter criteria (including selected query topic): Sources: All domestic news sources from Chile, Related country article content: Chile, Date range: 01/01/2009 – 12/31/2022, Language: Spanish

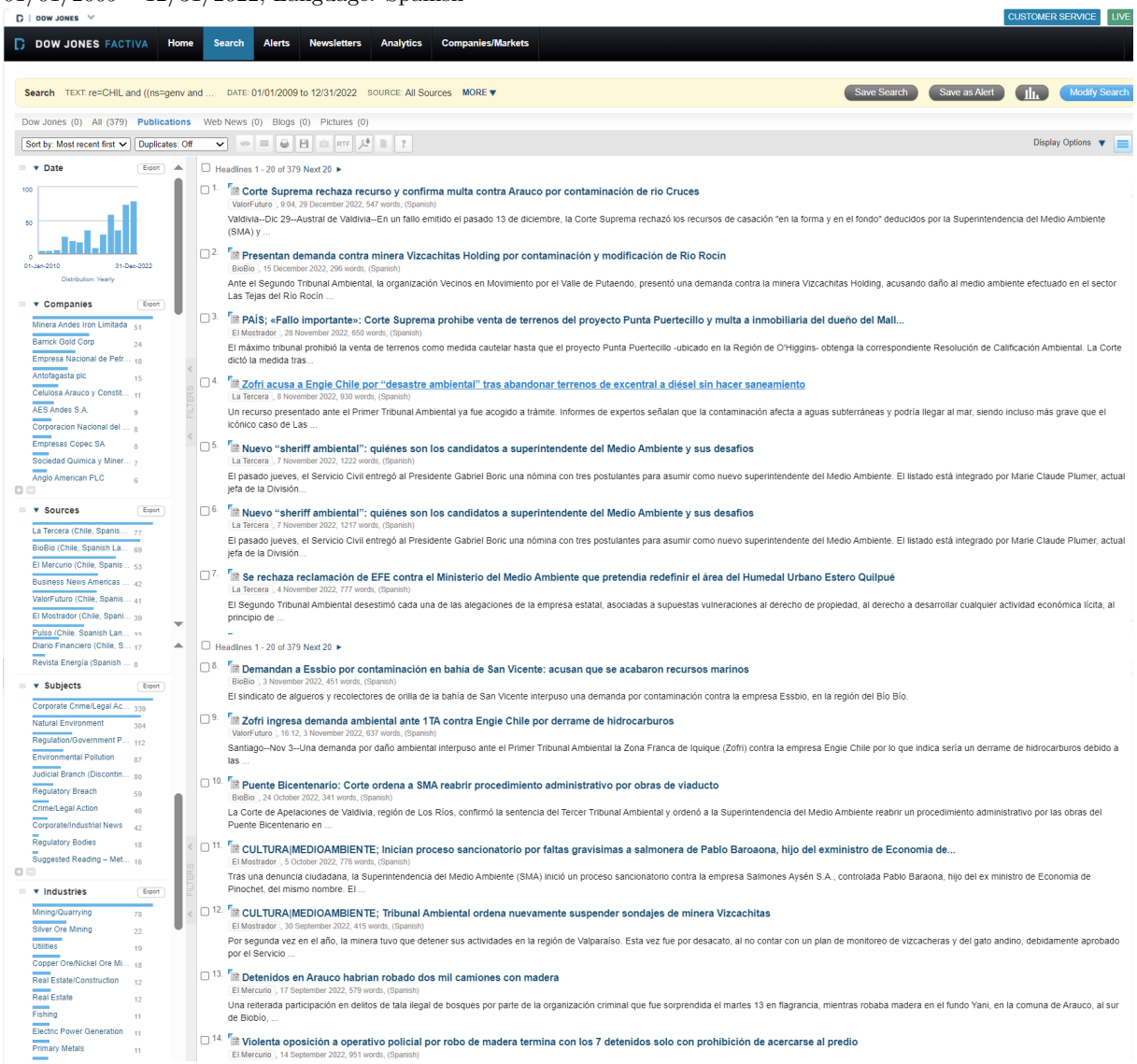
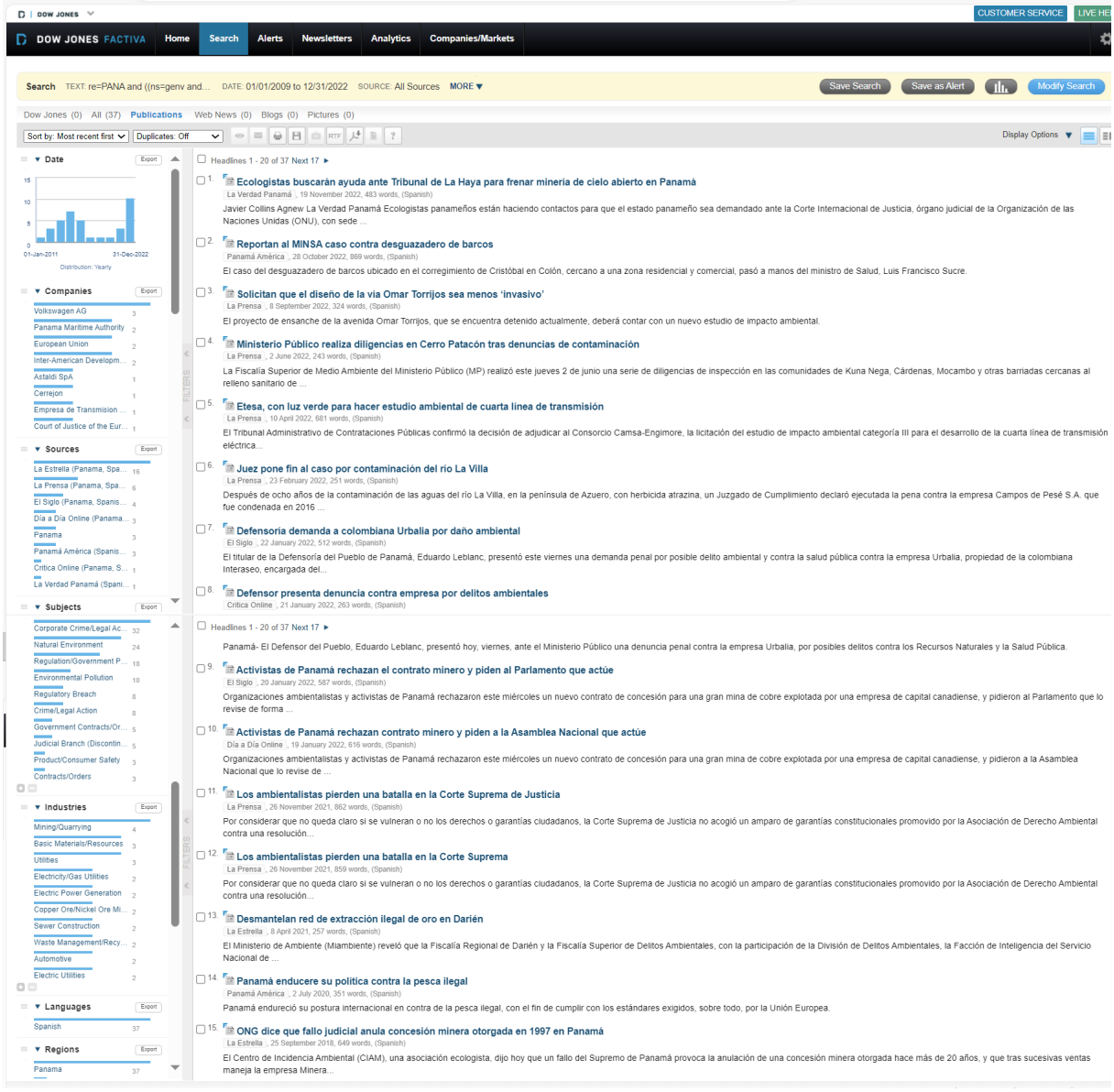


Figure A2: Domestic News for Panama

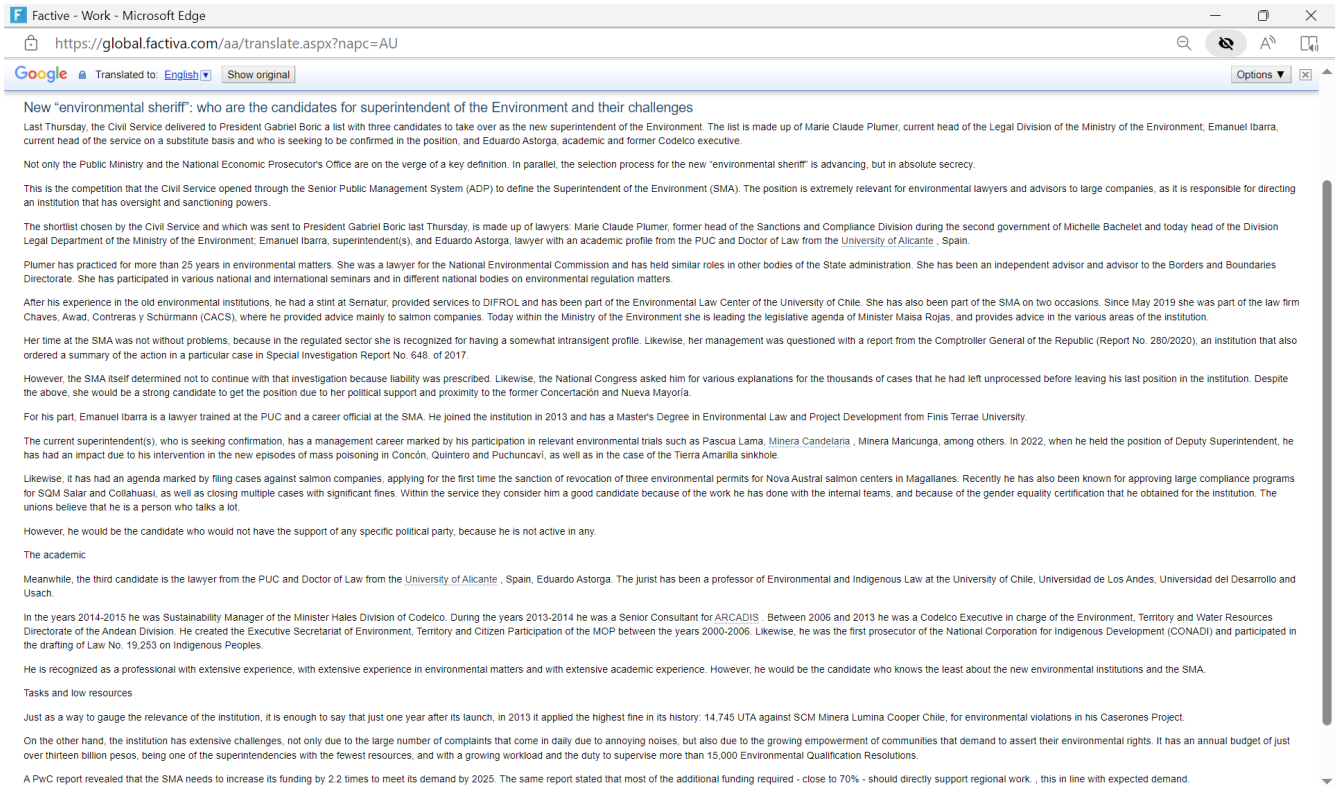
The selected query topic filter is: ((‘Natural Environment’ and ‘Corporate Crime/Legal Action’) and not (‘Carbon Sequestration’ or ‘Energy Efficiency’ or ‘Environmental Protection’)). Filter criteria (including selected query topic): Sources: All domestic news sources from Panama, Related country article content: Panama, Date range: 01/01/2009 – 12/31/2022, Language: Spanish



B2: Review of News Articles Identified through API News Counts using Factiva Professional

Figure A3: Filtered news search based on API count results: domestic sources for Chile

The selected query topic filter is: ((‘Natural Environment’ and ‘Corporate Crime/Legal Action’) and not (‘Carbon Sequestration’ or ‘Energy Efficiency’ or ‘Environmental Protection’)). Filter criteria (including selected query topic): Source: Domestic news source “La Tercera,” Related country article content: Chile, Date: 11/07/2022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Google Translated to: English Show original Options

New “environmental sheriff”: who are the candidates for superintendent of the Environment and their challenges

Last Thursday, the Civil Service delivered to President Gabriel Boric a list with three candidates to take over as the new superintendent of the Environment. The list is made up of Marie Claude Plumer, current head of the Legal Division of the Ministry of the Environment; Emanuel Ibarra, current head of the service on a substitute basis and who is seeking to be confirmed in the position, and Eduardo Astorga, academic and former Codelco executive.

Not only the Public Ministry and the National Economic Prosecutor's Office are on the verge of a key definition. In parallel, the selection process for the new “environmental sheriff” is advancing, but in absolute secrecy.

This is the competition that the Civil Service opened through the Senior Public Management System (ADP) to define the Superintendent of the Environment (SMA). The position is extremely relevant for environmental lawyers and advisors to large companies, as it is responsible for directing an institution that has oversight and sanctioning powers.

The shortlist chosen by the Civil Service and which was sent to President Gabriel Boric last Thursday, is made up of lawyers: Marie Claude Plumer, former head of the Sanctions and Compliance Division during the second government of Michelle Bachelet and today head of the Division Legal Department of the Ministry of the Environment; Emanuel Ibarra, superintendent(s), and Eduardo Astorga, lawyer with an academic profile from the PUC and Doctor of Law from the University of Alicante , Spain.

Plumer has practiced for more than 25 years in environmental matters. She was a lawyer for the National Environmental Commission and has held similar roles in other bodies of the State administration. She has been an independent advisor and advisor to the Borders and Boundaries Directorate. She has participated in various national and international seminars and in different national bodies on environmental regulation matters.

After his experience in the old environmental institutions, he had a stint at Sernatur, provided services to DIFROL and has been part of the Environmental Law Center of the University of Chile. She has also been part of the SMA on two occasions. Since May 2019 she was part of the law firm Chaves, Awad, Contreras y Schürmann (CACS), where he provided advice mainly to salmon companies. Today within the Ministry of the Environment she is leading the legislative agenda of Minister Maisa Rojas, and provides advice in the various areas of the institution.

Her time at the SMA was not without problems, because in the regulated sector she is recognized for having a somewhat intransigent profile. Likewise, her management was questioned with a report from the Comptroller General of the Republic (Report No. 280/2020), an institution that also ordered a summary of the action in a particular case in Special Investigation Report No. 648. of 2017.

However, the SMA itself determined not to continue with that investigation because liability was prescribed. Likewise, the National Congress asked him for various explanations for the thousands of cases that he had left unprocessed before leaving his last position in the institution. Despite the above, she would be a strong candidate to get the position due to her political support and proximity to the former Concertación and Nueva Mayoría.

For his part, Emanuel Ibarra is a lawyer trained at the PUC and a career official at the SMA. He joined the institution in 2013 and has a Master's Degree in Environmental Law and Project Development from Finis Terrae University.

The current superintendent(s), who is seeking confirmation, has a management career marked by his participation in relevant environmental trials such as Pascua Lama, Minera Candelaria , Minera Maricunga, among others. In 2022, when he held the position of Deputy Superintendent, he has had an impact due to his intervention in the new episodes of mass poisoning in Concón, Quintero and Puchuncaví, as well as in the case of the Tierra Amarilla sinkhole.

Likewise, it has had an agenda marked by filing cases against salmon companies, applying for the first time the sanction of revocation of three environmental permits for Nova Austral salmon centers in Magallanes. Recently he has also been known for approving large compliance programs for SQM Salar and Collahuasi, as well as closing multiple cases with significant fines. Within the service they consider him a good candidate because of the work he has done with the internal teams, and because of the gender equality certification that he obtained for the institution. The unions believe that he is a person who talks a lot.

However, he would be the candidate who would not have the support of any specific political party, because he is not active in any.

The academic

Meanwhile, the third candidate is the lawyer from the PUC and Doctor of Law from the University of Alicante , Spain, Eduardo Astorga. The jurist has been a professor of Environmental and Indigenous Law at the University of Chile, Universidad de Los Andes, Universidad del Desarrollo and Usach.

In the years 2014-2015 he was Sustainability Manager of the Minister Hales Division of Codelco. During the years 2013-2014 he was a Senior Consultant for ARCADIS . Between 2006 and 2013 he was a Codelco Executive in charge of the Environment, Territory and Water Resources Directorate of the Andean Division. He created the Executive Secretariat of Environment, Territory and Citizen Participation of the MOP between the years 2000-2006. Likewise, he was the first prosecutor of the National Corporation for Indigenous Development (CONADI) and participated in the drafting of Law No. 19,253 on Indigenous Peoples.

He is recognized as a professional with extensive experience, with extensive experience in environmental matters and with extensive academic experience. However, he would be the candidate who knows the least about the new environmental institutions and the SMA.

Tasks and low resources

Just as a way to gauge the relevance of the institution, it is enough to say that just one year after its launch, in 2013 it applied the highest fine in its history: 14,745 UTA against SCM Minera Lumina Cooper Chile, for environmental violations in his Caserones Project.

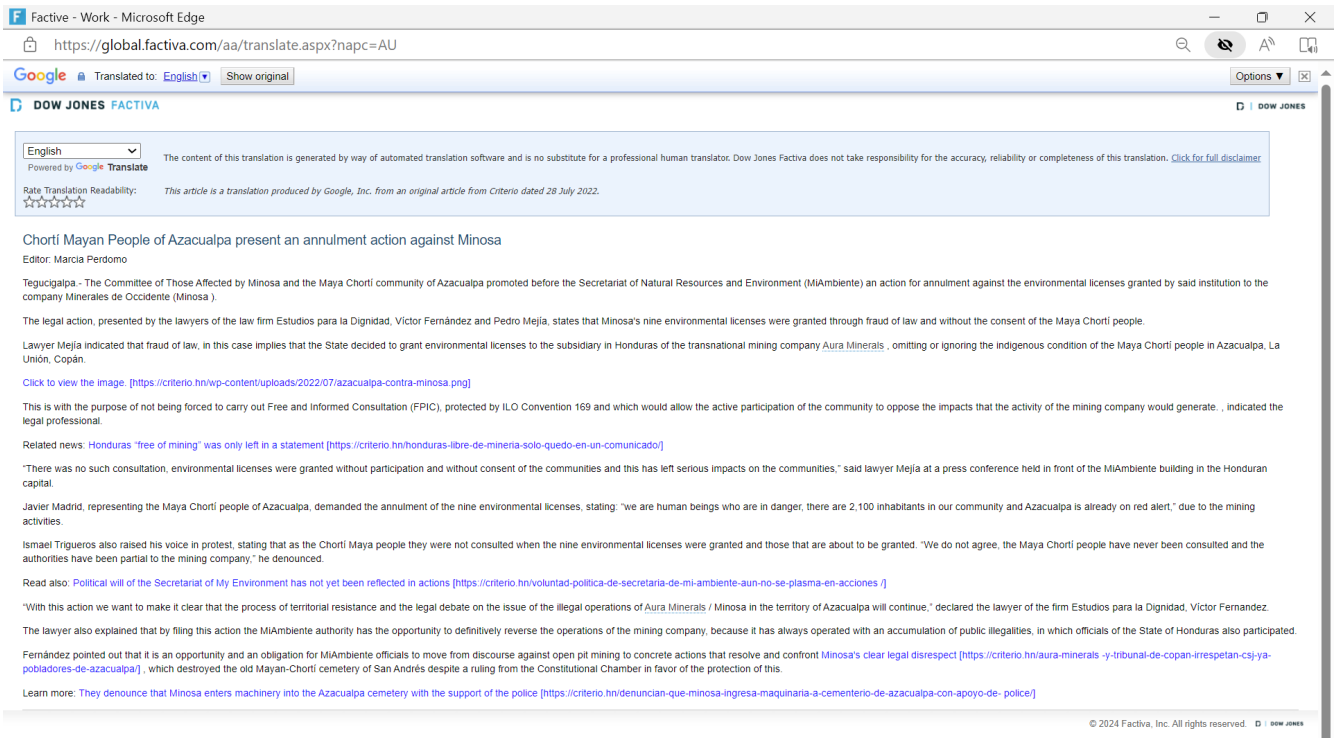
On the other hand, the institution has extensive challenges, not only due to the large number of complaints that come in daily due to annoying noises, but also due to the growing empowerment of communities that demand to assert their environmental rights. It has an annual budget of just over thirteen billion pesos, being one of the superintendencies with the fewest resources, and with a growing workload and the duty to supervise more than 15,000 Environmental Qualification Resolutions.

A PwC report revealed that the SMA needs to increase its funding by 2.2 times to meet its demand by 2025. The same report stated that most of the additional funding required - close to 70% - should directly support regional work. , this in line with expected demand.

Note: This news article was translated from Spanish (original) to English, powered by Google Translate.

Figure A4: Filtered News Search Based on API Count Results: Domestic Sources for Honduras

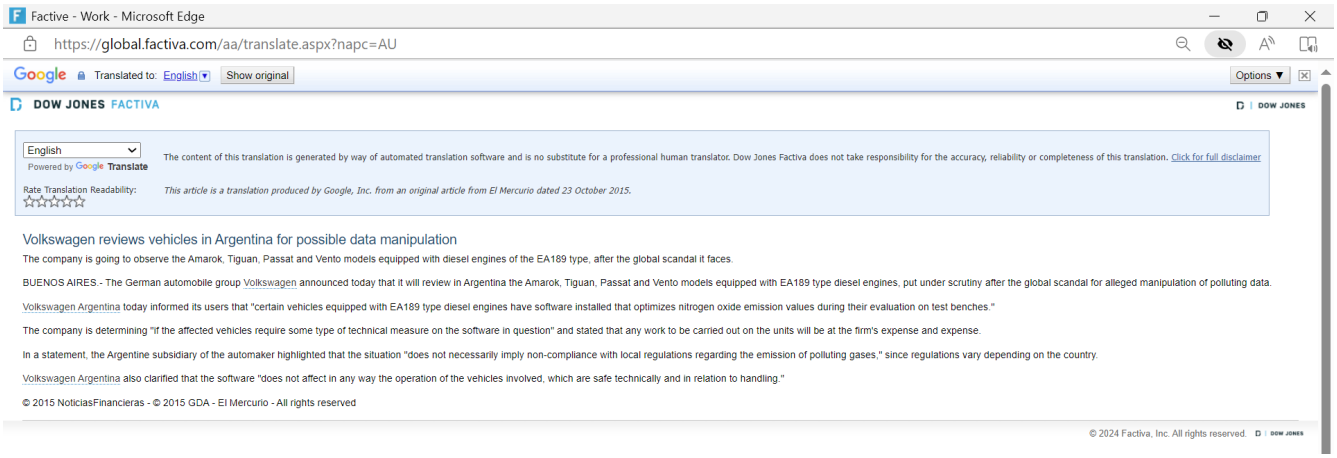
The selected query topic filter is: ((‘Natural Environment’ and ‘Corporate Crime/Legal Action’) and not (‘Carbon Sequestration’ or ‘Energy Efficiency’ or ‘Environmental Protection’)) Filter criteria (including selected query topic): Source: Domestic news source “Criterio,” Related country article content: Honduras, Date: 07/28/ 2022



Note: This news article was translated from Spanish (original) to English, powered by Google Translate.

Figure A5: Filtered News Search Based on API Count Results: Regional Sources for Argentina

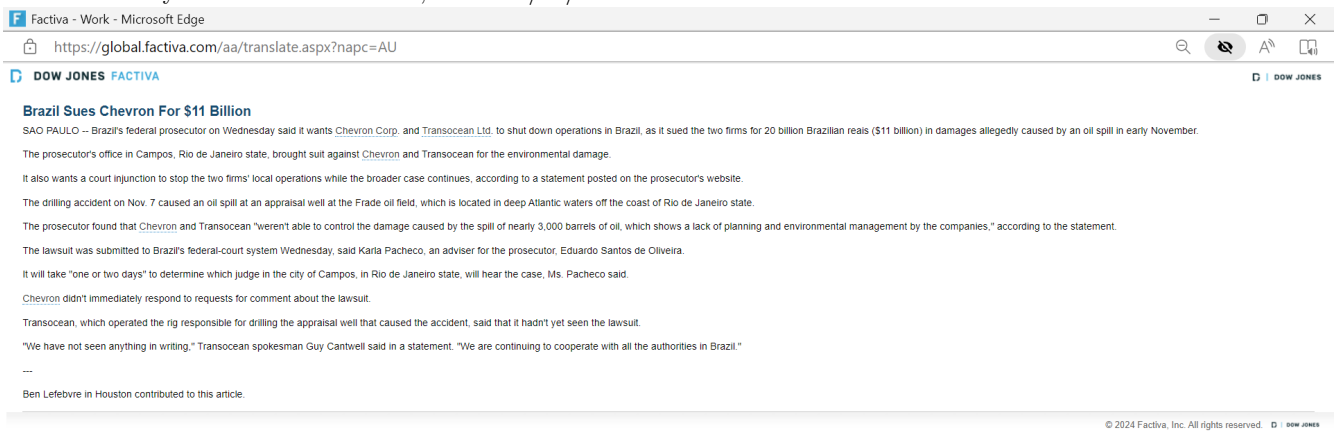
Filter criteria (including selected query topic): Source: Regional news source “El Mercurio (Chile),” Related country article content: Argentina, Date: 10/23/2015



Note: This news article was translated from Spanish (original) to English, powered by Google Translate.

Figure A6: Filtered News Search Based on API Count Results: World Sources for Brazil

Filter criteria (including selected query topic): Source: World news source "The Wall Street Journal (USA)," Related country article content: Brazil, Date: 12/15/2011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Brazil Sues Chevron For $11 Billion

SAO PAULO -- Brazil's federal prosecutor on Wednesday said it wants Chevron Corp. and Transocean Ltd. to shut down operations in Brazil, as it sued the two firms for 20 billion Brazilian reais ($11 billion) in damages allegedly caused by an oil spill in early November.

The prosecutor's office in Campos, Rio de Janeiro state, brought suit against Chevron and Transocean for the environmental damage.

It also wants a court injunction to stop the two firms' local operations while the broader case continues, according to a statement posted on the prosecutor's website.

The drilling accident on Nov. 7 caused an oil spill at an appraisal well at the Frade oil field, which is located in deep Atlantic waters off the coast of Rio de Janeiro state.

The prosecutor found that Chevron and Transocean "weren't able to control the damage caused by the spill of nearly 3,000 barrels of oil, which shows a lack of planning and environmental management by the companies," according to the statement.

The lawsuit was submitted to Brazil's federal-court system Wednesday, said Karla Pacheco, an adviser for the prosecutor, Eduardo Santos de Oliveira.

It will take "one or two days" to determine which judge in the city of Campos, in Rio de Janeiro state, will hear the case, Ms. Pacheco said.

Chevron didn't immediately respond to requests for comment about the lawsuit.

Transocean, which operated the rig responsible for drilling the appraisal well that caused the accident, said that it hadn't yet seen the lawsuit.

"We have not seen anything in writing," Transocean spokesman Guy Cantwell said in a statement. "We are continuing to cooperate with all the authorities in Brazil."

Ben Lefebvre in Houston contributed to this article.

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