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Abstract

Climate change is a major concern for many companies, but it has not historically featured much in earnings conference calls. We find a marked increase in climate talk on these calls in recent years. We also find that climate talk is negatively related to the change in CO₂ emissions (especially Scope 2) in the year after the call, particularly in firms with high overall environmental and governance ratings. Conversely, investors react particularly negatively to climate talk when it comes from a firm with low levels of ESG performance or following poor earnings performance. Finally, a firm employs more climate talk when it is more material, when there is greater shareholder pressure or when it is better prepared for climate-related disclosure. Overall, these results suggest that investors and other stakeholders interested in corporate climate action should be paying attention to earnings conference calls as a source of useful information about companies' broader stance on climate-related issues.

Keywords: climate talk, earnings calls, sustainability, CO₂ emissions, greenwashing

JEL codes: D83, G14, G34, G41, Q54

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1 Introduction

The interest of institutional investors in sustainability issues in general and climate change in particular has been steadily growing over the past 20 years. In 2020, almost 36 per cent of total assets under management globally were labelled sustainable investment (GSIA, 2021), including those of many public pension funds. The world's largest asset management company, BlackRock, publicly stated in 2018 that environmental, social and governance (ESG) issues are essential to long-term value creation (e.g. Sorkin, 2018). Concerns over climate change and what it might entail for long-term investment value and returns have resulted in initiatives such as Climate Action 100+, the Net-Zero Asset Owners Alliance, and most recently the Glasgow Financial Alliance for Net Zero, where many (although far from all) institutional investors have come together to put pressure on companies to take the necessary action on climate change.

The increasing focus on climate change in the investment community has been accompanied by mounting scientific evidence and political momentum, manifest not least in the Kyoto Protocol of 2009 and the Paris Agreement of 2015. According to the Sustainability Standards Accounting Board (SASB), climate change is likely to materially affect almost all industries. Today, many institutional investors believe that climate risks will have financial implications for their portfolio firms, and that these risks, particularly of the regulatory kind, are already arising (Krueger et al., 2020). Bolton & Kacperczyk (2021a) show that CO₂ emissions are indeed a negatively priced factor in the cross-section of stock returns.

If climate change is financially material, it arguably merits the same attention in corporate disclosure as any other issue likely to affect corporate financial performance (Eccles & Serafeim, 2013). The quarterly earnings call is rated as one of the most important interfaces between companies, investors, and financial analysts (Brown

et al., 2015). Analysts use information from the earnings call in their fundamental analysis of the company. However, many companies seem to find it difficult to talk about sustainability in general and climate change in particular during quarterly earnings calls (Eccles & Serafeim, 2013; Eckerle et al., 2020; Setterberg et al., 2021). Anecdotally, climate issues hardly register during quarterly earnings calls, and some companies and investors argue that the earnings call's short-term focus means that it is not an appropriate forum for the discussion of sustainability issues (Setterberg et al., 2021). However, Eccles & Serafeim (2013) warn that neither companies nor investors will be seen as taking sustainability, including climate change, seriously unless these topics are integrated into the quarterly earnings call.

This paper investigates climate talk in corporate earnings calls, using an extensive, global sample of the past two decades. We ask three questions that shed light on whether it makes sense for investors and other stakeholders interested in corporate climate actions to pay attention to quarterly earnings calls: First, do firms that talk more about climate change during earnings calls in fact reduce their emissions more in the future? Second, how do investors respond to climate talk? Third, does climate talk take place more where shareholders and other stakeholders might reasonably expect them to?

To capture discussions of climate change, we compute the textual similarity between earnings call transcripts and a reference library of texts focused on climate change. We include almost 350,000 transcripts of earnings calls for 11,363 firms from around the globe in the period 2002-Q12021. As a climate-related reference library, we use the five reports issued by the Intergovernmental Panel on Climate Change (IPCC). For each transcript we create a vector of all bigrams, that is combinations of two consecutive words, and their term frequency-inverse document frequency ($tf-idf$) scores. We then calculate the cosine similarity between this vector and an analogous vector created from the IPCC reports. Our measure is inspired by Engle et al. (2020),

who use it to capture climate news in Wall Street Journal articles.

Over the course of our 20-year sample climate talk in earnings calls gradually increase until the beginning of 2010, before partially declining in the period 2010-2018, then increasing rapidly from 2019. Our evidence is consistent with Henry et al. (2021), who show that environmental disclosure in quarterly earnings calls has increased over the past 15 years.

Our first main result concerns whether more climate talk translates into more climate action. We focus on CO₂ emission reductions, which will be instrumental in keeping the rise in global temperatures below dangerous levels. Since data on corporate CO₂ emissions are only available annually, we average the measure of climate talk across the four earnings calls in each calendar year. We find that more climate talk in one year predicts a statistically significant decrease in CO₂ emissions in the following year. Thus, the words of Eccles & Serafeim (2013) ring true in that discussing climate change in earnings calls signals that companies are taking climate issues seriously.

Mindful of the important findings of Bolton & Kacperczyk (2021b) that firm-level commitments to reducing CO₂ may not translate into meaningful reductions in aggregate emissions, we calculate the hypothetical emissions that would occur in the absence of any climate talk during earnings calls, which would signal a less serious approach to climate change. We find that aggregate hypothetical emissions would be between 1.1% and 2.3% higher than those actually reported, suggesting that firms' attitudes as signalled by climate talk also make a difference on aggregate.

Heterogeneity across emission types and across firm types provides more color on these results. We find, first, that the overall CO₂ reductions are mostly driven by reductions in Scope 2 emissions, which are indirect emissions linked to the purchase of electricity, steam, heat or cooling. Second, climate talk in the Q&A session is more credible and followed by a stronger reduction in CO₂ emissions in well-governed firms and in firms with a track record of good environmental ratings. This suggests that

climate talk can indeed signal a serious approach to climate action, but can also be “hot air”.

Our second inquiry concerns how investors respond to climate talk during earnings calls. We analyze cumulative abnormal returns (*CARs*) over two days spanning each call. On average, investors trading on earnings call information react negatively to climate talk, controlling for the earnings surprise and a range of firm characteristics. Further analysis reveals that investors are particularly critical of climate talk by firms with low ESG scores, by firms for which climate change is less material, and when climate talk follows negative earnings surprises. Given that managers take stock price feedback into account, these results suggest that financial market mechanisms alone are unlikely to encourage companies to increase climate talk in earnings calls. However, well-governed firms can reduce carbon emissions, and talk about climate policy, without penalty from investors.

Finally, we consider which factors drive climate talk in earnings calls. If climate talk is systematically related to factors that shareholders and other stakeholders might arguably consider important for the climate exposure of a company, this would provide further indications of the relevance of what firms say regarding climate change during earnings calls. First, we hypothesize that firms with more prominent exposure in terms of the materiality of climate-related issues are more likely to talk about these issues in earnings calls. We rely on the SASB Materiality Map to identify such firms. Second, we hypothesize that market discipline could be an effective driver. We investigate whether firms that are targeted by the Climate Action 100+ platform talk more about climate in earnings calls.¹ Finally, we investigate how a firm’s prepared-

¹ Climate Action 100+ is an investor-led initiative seeking to influence the world’s largest corporate greenhouse gas emitters to take appropriate action on climate change. At the end of 2021, it is backed by 545 investors with more than \$52 trillion Assets under Management in over 33 markets, including the world’s largest asset manager, BlackRock. The original list with 100 target companies was released in December 2017 and expanded with 61 companies in June 2018.

ness to disclose information on climate-related issues is reflected in discussions in the earnings call. Here, we look at company adoption of the guidelines issued by the Task Force on Climate-Related Financial Disclosures (TCFD).

We find that companies are indeed more prone to talk more about climate change in earnings calls (1) if they are in a sector in which green-house gas (GHG) emissions are highly material, (2) if they have been targeted by Climate Action 100+, or (3) if they have officially endorsed the TCFD climate disclosure standards. Thus, a combination of materiality, shareholder pressure and appropriate guidelines appears effective at motivating companies to address climate change in their earnings calls.

Overall, these results suggest that it can pay off for investors and other stakeholders interested in corporate climate actions to pay careful attention to discussions about climate-related issues in earnings calls.

This paper contributes to the literature in three ways. First, we contribute empirically to the “walk the talk” versus “greenwashing” literature (e.g. Delmas & Burbano, 2011; Christensen et al., 2013; Wickert et al., 2016) by exploring the relation of climate-related disclosure with CO₂ emissions. Recent work specifically related to earnings calls has brought mixed results: while some studies found that climate and environmental disclosure was not followed by action (Hail et al., 2021), others claim that environmental talk is associated with better environmental performance such as greater pollution abatement and a higher number of future green patents (Chava et al., 2021). Our research sheds more light on this question by showing that, at least in the climate context, talk during earnings calls is associated with walk. We reveal important cross-sectional heterogeneity in these actions, and show that investors take these into account when assessing climate talk.

Second, we add to the earnings calls literature by expanding the nascent stream of studies that empirically explores sustainability-related talk in this setting. While much has been said about earnings calls in general, such as on market reaction to

call tone (e.g. Price et al., 2012; Blau et al., 2015; Brockman et al., 2017; Druz et al., 2020), and manager-analyst interactions (e.g. Matsumoto et al., 2011; Mayew, 2008), it is only recently that researchers have started to pay attention to non-financial content such as environmental issues.² We extend this small but growing pool of studies in several ways: We focus on climate change rather than the environment or sustainability more generally, which provides a more focused empirical setting that allows for a tighter link to the outcome variable of carbon emissions reductions. Moreover, our research identifies hitherto unexplored determinants in this context, such as shareholder pressure and reporting preparedness; focuses on all industries rather than a limited set; and provides a longer time series than previous studies.

Third, we contribute to the literature on applying textual analysis in finance. Capturing climate talk is challenging, because there are no accepted dictionaries or word lists of climate-related terms. Different authors have thus developed their own approaches. Sautner et al. (2020) apply a keyword discovery algorithm, which allows them to compile a broad set of bigrams, starting with a small hand-picked set of “initial” bigrams, related to different aspects of climate change (physical, regulatory and opportunity). A string of related papers by Diggelmann et al. (2021), Varini et al. (2021), and Webersinke et al. (2021) apply and refine advanced natural language processing techniques such as BERT to identify climate change topics and to verify climate-related claims. In comparison, our approach, inspired by Engle et al. (2020), is relatively simple, yet it proves helpful in measuring the overall intensity of climate talk and in explaining variation in corporate actions and investor reactions.

² See for example: Henry et al. (2021); Mahdavi et al. (2021); Chava et al. (2021); Hail et al. (2021); Setterberg et al. (2021); Sautner et al. (2020); Raman et al. (2020); Eckerle et al. (2020); Eccles & Serafeim (2013); Li et al. (2020); Bochkay et al. (2021).

2 Hypotheses

Clearly, just talking about climate change will have little impact on it. Thus, for our first hypothesis, we are interested in whether companies walk the talk, and if climate talk in earnings calls is followed by climate action. On the one hand, there is growing concern that company talk on climate change amounts to “greenwashing”, or making environmental commitments that are not matched by actions. For instance, Reid & Toffel (2009) note that while shareholder proposals requesting greater corporate social responsibility (CSR) disclosure increase companies’ propensity to publicly disclose GHG emissions, this increased disclosure does not generally result in a change in corporate activities, at least not in the short term.

On the other hand, research in organization studies suggests that talk might drive walk. According to Christensen et al. (2013, 2021), aspirational talk about CSR can stimulate CSR improvements and social change. Drawing on 12 years of experience in the CDP (formerly known as the Carbon Disclosure Project), Topping (2012) presents anecdotal evidence that climate disclosure drives behavioral change, albeit without supplying proof of decreased CO₂ emissions. Arguably, the special standing of earnings calls in the communication between companies and markets could motivate managers only to discuss the topics on which they intend to deliver. While Chava et al. (2021) find that environmental talk in earnings calls is reflected in improved environmental action, Hail et al. (2021) argue that even this venue is used for greenwashing.

In the light of these mixed findings, the null hypothesis is that there is no association between climate talk and subsequent CO₂ emissions. Alternatively, if climate talk in earnings calls signal a more serious approach to the topic, we would expect to see that:

H1a: Firms with more climate talk in earnings calls reduce CO₂ emissions by more (or increase them by less) than companies with less climate talk.

Finally, if climate talk on earnings calls is greenwashing, it may actually allow companies to get away with substandard climate actions, leading to the opposite prediction that:

H1b: Firms with more climate talk in earnings calls reduce CO₂ emissions by less (or increase them by more) than companies with less climate talk.

Note that we are not postulating a causal effect of climate talk on CO₂ emissions, even though previous studies have shown that talk can trigger action. Our more modest objective is to determine whether such talk is cheap in earnings calls or actually rooted in a more serious approach to the topic, which results in steeper reductions in CO₂ emissions.

Our second approach to assessing the relevance of climate talk in conference calls is to examine how climate talk affects firm valuations. If investors expect that firms initiating climate talk will have higher cash flows in the future (e.g., through innovative and climate-friendly innovations that augment their capacity to meet regulatory needs or other opportunities), then a positive effect on shareholder reactions should be expected following the earnings call. Investors could also perceive these firms to be less risky. For example, in line with the majority of the disclosure literature, increased disclosure might be expected to reduce the cost of equity capital through a

reduction in information asymmetry, which would also increase firm value.³

H2a: Climate talk is positively associated with announcement returns.

On the other hand, it is conceivable that greater climate disclosure during earnings calls is associated with lower expected future cash flows and/or higher cost of capital, leading investors to bid down share prices of such companies. A wider discourse about climate-related issues might induce expectations that the company might invest in negative net-present value (NPV) projects. Such projects could be undertaken for agency reasons but they might also be undertaken for regulatory reasons that are seen as value-destroying by investors. Investors could thus fear that the firm no longer prioritizes maximizing financial performance. Relatedly, the climate-related talk could be seen as an attempt at greenwashing, with negative reputational or even legal consequences. Finally, discussion about climate-related issues could increase uncertainty about a firm's future cash flows due to the inherent uncertainty about climate change. Overall, these considerations suggest:

H2b: Climate talk is negatively associated with announcement returns.

A third, complementary approach to evaluating the merits of climate talk in earnings calls is to investigate which firm characteristics determine its extent. While climate change is relevant to most sectors and industries, some are likely to have a stronger business-relevant link to it than others. The notion of materiality is helpful

³ See Plumlee et al. (2015), who finds a reduction of the cost of equity capital for sustainability disclosures. However, current research in accounting is critical towards a reduction effect based on disclosure (Eugster, 2020), proposes a non-linear relationship (Athanasakou et al., 2020), or indicates that the growth of the firm moderates the effect of disclosure on cost of equity (Ellahie et al., 2021).

here. Materiality refers to the quality of being relevant or significant. In a sustainability context, materiality is a way to denote which of the broad set of sustainability issues is deemed key to a particular company's long-term success - by corporate stakeholders and corporate management (Eccles et al., 2012). Many companies nowadays carry out materiality assessments to identify and prioritize such issues. To aid this work, the independent Sustainability Accounting Standards Board (SASB) provides guidance on the disclosure of financially material sustainability issues for 77 industries.

Research shows that firms with good ratings on material sustainability issues significantly outperform firms with poor ratings on these issues (Consolandi et al., 2020; Kotsantonis & Bufalari, 2019; Khan et al., 2016; Van Heijningen, 2019).

Given that materiality indicates financial relevance and even seems to predict financial performance, it would arguably make sense for companies to discuss material sustainability issues with analysts and investors. We therefore propose that companies for which climate change is highly material would be more prone to talk about it and be questioned about it in an earnings call.

H3a: Climate talk is more prevalent in firms in industries where climate change is ranked as highly material.

The acknowledgement that sustainability and climate change are strategically important has led to a wealth of disclosure on these topics (Bolton & Kacperczyk, 2021c). Some companies have adopted the method of “integrated reporting”, which combines financial and non-financial information to explain how the organization creates, preserves or erodes value over time.⁴ The realization that climate change issues can

⁴ See Barth et al. (2017) and Eugster & Wagner (2020) for the financial performance effect of Integrated Reporting and Value Reporting, respectively.

be financially material has also spurred demand for corporate disclosure that specifically addresses the financial implications of climate-related risks and exposures. A survey among institutional investors shows that a majority believe that climate risk reporting is as important as financial reporting, and one-third believe that climate risk reporting is even more important (Krueger et al., 2020). Voices have even been raised for mandatory and enforced carbon disclosures (Bolton et al., 2021). To propel investor-useful climate disclosure, the Task Force on Climate-Related Financial Disclosures (TCFD) was launched by the Financial Stability Board in 2015. It encourages companies to supply the financial markets with reliable and relevant climate-related information. As of the end of 2021, 2,800 organizations in 89 jurisdictions were listed as “supporters” of the TCFD, and thus expected to use the framework.

Reporting on climate issues is notoriously challenging, and many companies struggle to disclose accurate and relevant data. We propose that companies that are already disclosing financially relevant climate information in other forums might be better prepared to also address the issue in the quarterly earnings call.

H3b: Climate talk is more prevalent in firms that are committed to financially relevant climate disclosure.

Much of the pressure on corporations to address climate issues in their strategic and operational efforts comes from the investor community. The number of climate-related shareholder proposals has increased over time (Horster & Papadopoulos, 2019; Treviño et al., 2021) but they are also now attracting increasingly higher votes (Hale, 2019). Recent research shows that firms are more likely to disclose climate-related information if they are pressured to do so by institutional shareholders via the proxy vote on environmental issues (Flammer et al., 2021). This is in line with neo-institutional theory, which posits that companies are dependent on the

organizational legitimacy conferred by key stakeholders (Powell & DiMaggio, 1991). We therefore propose that companies under such pressure from investors are more prone to include climate issues in the quarterly earnings calls.

H3c: Climate talk is more prevalent in firms that are targeted by shareholder pressure on climate change.

3 Data

3.1 Conference calls transcripts and other data

We use the transcripts of the quarterly earnings calls of all publicly listed companies worldwide from 2002 until the end of the first quarter of 2021. These were obtained from Thomson Reuters Street Events. We start with a sample of 345,553 earnings calls for 11,363 unique companies. We merge this data with the available data from Thomson Eikon and require ESG data with Asset-4 coverage. These data requirements reduces the sample to 6,705 unique companies. After merging with earnings data, we are left with 118,984 firm-quarters. We also require that the control variables and some of the outcome variables should be available, ending up with 4,610 unique firms and 85,829 firm-quarters. The sample consists of firms headquartered in 65 countries worldwide. Not surprisingly, the United States contributes most firms to the sample, at 63.21% of all firms.⁵ All the accounting data is converted into US dollars. We also observe that the sample is more populated in the most recent years of the sample period. For example, 2019 contains roughly 14% of all the firm-quarters, whereas 2002 contains just 0.6%. This was due to the coverage of our data providers

⁵ Canada, Germany, Japan, and Sweden follow on ranks two through five.

and the availability of ESG data. On average, there are 15 quarterly earnings calls per company in the sample. Our sample does not exclude any particular industry and contains the full range of listed firms.

In our real effect tests, we investigate whether there is a reduction in CO₂ emissions in the period following the earnings calls. However, the additional data requirements reduce the final sample size for that particular test, given that not all firms disclose this kind of information. We then transfer the quarterly measures from the quarterly earnings calls to the yearly measure by averaging the available quarterly measures in that calendar year. We also try to disentangle the real effect and look into Scope 1, Scope 2, and Scope 3 CO₂ emissions, reducing the sub-sample slightly due to the variable availability of data.

We use accounting, market and ESG data from Eikon. Data about which companies support TCFD and which companies are targeted by Climate Action 100+ were obtained directly from these initiatives. The materiality matrix was taken from the SASB's website.

4 Capturing climate-related discussions in earnings calls

We adapt the approach of Engle et al. (2020) and capture the extent to which companies discuss climate change in their earnings calls by measuring the textual similarity between the transcripts of such calls and a reference library of documents that we can be reasonably sure are devoted to climate change. We use the five assessment reports published by the IPCC at regular intervals between 1992 and 2014 as our reference library.

To operationalize textual similarity, we first remove common stopwords, such as

“the”, “and”, and “or”, from the transcripts. Then, for each transcript we construct a list of all bigrams - that is adjacent two-word combinations - that occur in the remaining text⁶ and calculate their term frequency-inverse document frequency ($tf - idf$) scores. Term frequency is the number of times a bigram occurs in a given transcript. Document frequency, by contrast, is the number of documents (transcripts) in which a bigram occurs. Thus, the $tf - idf$ score of bigram b in transcript t is given by:

$$tf - idf_{b,t,T} = f_{b,t} \cdot \log \frac{T}{\#\{b \in t\}}$$

where $f_{b,t}$ is the frequency of bigram b in transcript t , T is the number of all transcripts in our dataset and $\#\{b \in t\}$ is the number of transcripts containing bigram b . Intuitively, bigrams receive a high $tf - idf$ score if they occur frequently in a given transcript but not across very many transcripts. Controlling for document frequency ensures that bigrams common to earnings calls, such as “this quarter,” do not dominate the ranking.

Similarly, we construct a list of all bigrams (excluding stopwords) and their term frequencies in the IPCC reports, having merged all five reports into a single document. In order to arrive at $tf - idf$ scores, we multiply term frequencies with inverse document frequencies obtained for the same bigrams from the earnings call transcripts.⁷

Finally, we calculate the textual similarity of an earnings call transcript with the IPCC benchmark as the cosine similarity between the $tf - idf$ vector of that transcript and the $tf - idf$ vector obtained from the IPCC reports. Cosine similarity captures

⁶ Studies in computational linguistics, such as Bekkerman & Allan (2004) argue that using n-grams (usually bigrams) of words as opposed to single words (unigrams) improves the results of text classification.

⁷ Applying idf weights from transcripts also to IPCC bigram frequencies may seem arbitrary. However, if we calculated idf within the five IPCC reports, we would down weight the most informative climate change bigrams and unduly distort our measurement of textual similarity.

the degree to which two vectors “point in the same directions” in high-dimensional space. In our case, it captures the extent to which the same bigrams appear in the same proportions in the transcripts and in the IPCC reports. In cases of perfect overlap, the similarity is equal to 1 while if there is no overlap at all, it is 0. To the extent that the IPCC reports represent the canonical way to discuss climate change, the cosine similarity we measure allows us to gauge the extent to which firms raise this topic in their earnings calls.

We calculate three variants of textual similarity (climate talk, CT) to the IPCC benchmark: CT_{CALL} , based on the entire earnings call transcript, CT_{PRE} , based only on the presentation part, and finally, CT_{QA} , based on the questions and answers (Q&A) session between managers and analysts participating in the call.⁸

4.1 Summary statistics

The overall summary statistics are tabulated in Table 2. Our results show that, while the level of climate-related talk in quarterly earnings calls has been fairly constant for the previous 20 years, there was a marked increase in 2019 that has been maintained since. While we might have expected a notable rise after 2015, the year in which both the Paris Agreement and the Sustainable Development Goals were adopted, and when initiatives such as Science-Based Targets and the TCFD were launched, there was apparently a lag in these developments being reflected in earnings calls. We also observe that the presentation part in the earnings call contains a greater amount of climate-related talk compared to the Q&A session. Interestingly, the amount of climate talk in the answers is greater than in the questions asked by analysts. These results are visualized in Figure 1.

⁸ In the determinants analysis we also consider climate talk in questions (CT_Q) and answers (CT_A) separately.

[Insert Table 2 and Figure 1 about here]

We find that firms in the (1) Renewable Resources & Alternative Energy and (2) Resource Transformation, and the (3) Extractives & Minerals Processing industries have the highest average amount of climate discussion. These are all sectors in which one would intuitively expect firms to talk extensively about climate-related issues, given the nature of their operations. However, we find substantial heterogeneity within each sector, meaning that there are large cross-sectional differences even among similar firms in terms of climate talk. This is illustrated in Figure 2.

[Insert Figure 2 about here]

5 Results

5.1 Empirical approach

Our analysis proceeds in three steps. First, we investigate whether climate talk is related to climate action. To this end, we transform the quarterly data to yearly frequency using the average measure of climate talk and link this to annual CO₂ emissions data from Asset 4. Second, we analyze stock price reactions to climate talk in earnings calls. We are especially interested in whether investors respond positively to climate talk if this in turn is positively related to environmental performance. This will give a sense of whether markets can be a force for good in promoting constructive climate disclosure. Third, we examine determinants of climate talk to shed light on whether its occurrence is systematic.

5.2 Does climate talk predict lower CO₂ emissions?

Reducing CO₂ emissions is paramount for preventing dangerous levels of climate change. Thus, to understand whether there is substance behind the climate talk in earnings calls, we investigate their relationship with subsequent CO₂ emission levels. As the dependent variable, we calculate the percentage change in total CO₂ emissions in year $t + 1$ reported by company i :

$$\Delta CO2_{i,t+1} = \frac{CO2_Total_{i,t+1} - CO2_Total_{i,t}}{CO2_Total_{i,t}} \cdot 100\%$$

We first illustrate the link between ΔCO_2 using binned scatter plots, shown in Figure 3. The slopes are uniformly negative for both the entire call, Panel (a), and the presentation and Q&A sections individually, Panel (b) and (c) respectively. There do not appear to be any significant outliers driving the overall results.

[Insert Figure 3 about here]

To formalize the visual intuition, we regress $\Delta CO2_{i,t+1}$ on (average) climate talk (CT) in year t and a range of control variables, reflecting the company's sustainability profile as well as standard firm characteristics, all of which could affect future emissions:

$$\begin{aligned} \Delta CO2_{i,t+1} = & \beta_1 CT_CALL/PRE/QA_{i,t} + \beta_j CSR_{i,t}^j + \beta_k FirmChars_{i,t}^k \\ & + Industry_i + Year_t + \epsilon_{i,t} \end{aligned} \quad (1)$$

The matrix CSR^j contains the following indicator variables (see Table 1 for definitions): *POLICYEMISSIONS*, *TARGETSEMISSIONS*, *TARGETYEAR*, *CSR-REPORTING*, *CSR-AUDIT*, *CSR-INCENTIVE* and *CSR-COMMITTEE*. These capture the extent to which sustainability in general and emissions in particular

are incorporated into a company's policies and disclosure. The matrix *FirmChars^k* comprises the following variables: *ln_SIZE*, *ln_BM*, *ROA*, *LEVERAGE*, *SCALED_PPE* and *SCALED_CAPX*. Finally, we include industry- and year-fixed effects.

Table 3 summarizes the baseline results. For ease of interpretation, we standardize all continuous variables to a mean of 0 and a standard deviation of 1, which we denote with the suffix STD in the variable name. In Column (1), we show that controlling for firm characteristics an increase in *CT* on the entire earnings call by one standard deviation is associated in a 0.8 percentage points smaller change in CO₂ emissions in the following year.

This result is also robust following inclusion of the various CSR variables, Column (2), and the economic magnitude also remains meaningful at a 0.6 percentage point decrease in CO₂ emissions for a one-standard deviation increase in climate talk. Following further analysis, we find that this effect comes mostly from climate talk during the Q&A part of the call. Overall, these results support Hypothesis 1a - that firms that talk more about climate in their earnings calls produce larger decreases (or smaller increases) in their subsequent CO₂ emissions.

We do not interpret our results as evidence of a causal link between climate talk and subsequent emissions. Rather, our interpretation is that climate talk in earnings calls signals a serious attitude by a company to the climate challenge.

[Insert Table 3 about here]

5.2.1 Aggregate impact

An important concern highlighted by Bolton & Kacperczyk (2021b) is that the firms willing to commit to reductions in CO₂ emissions are primarily those with low emissions to begin with, meaning that such commitments have little impact on aggregate emissions. To get a sense of the aggregate impact of firms' attitudes revealed

through climate talk, we conduct a simple counterfactual exercise following Eskander & Fankhauser (2020), who apply it in the context of climate legislation. Based on Equation 1, we can express the difference between estimated changes in emissions ($\Delta C\hat{O}2_{i,t+1}$) and hypothetical changes in emissions ($\Delta C\tilde{O}2_{i,t+1}$) when the value of CT_CALL is set to 0 for all i, t :

$$\Delta C\hat{O}2_{i,t+1} - \Delta C\tilde{O}2_{i,t+1} = \hat{\beta}_1 CT_CALL_{i,t}$$

Consequently, we can express the hypothetical change in emissions for company i in year $t + 1$ as:

$$\begin{aligned}\Delta C\tilde{O}2_{i,t+1} &= \Delta C\hat{O}2_{i,t+1} - \hat{\beta}_1 CT_CALL_{i,t} \\ &\approx \Delta CO2_{i,t+1} - \hat{\beta}_1 CT_CALL_{i,t}\end{aligned}$$

In the second line above, we replace estimated changes with the actual changes observed in our data.⁹ To convert from changes to hypothetical levels of emissions, we multiply the reported level of CO₂ emissions in year t by the hypothetical change for year $t + 1$ calculated as above:

$$CO\tilde{2}_{i,t+1} = CO2_{i,t} \cdot (1 + \Delta C\tilde{O}2_{i,t+1})$$

Finally, we calculate hypothetical aggregate emissions for each year by summing across all companies for which we were able to calculate hypothetical emissions in that year. As the vertical bars in Figure 4 show, hypothetical aggregate emissions exceed reported aggregate emissions for the same sample of companies by between 1.1% and 2.3% in every year.

⁹ This is an approximation, since estimated and observed changes differ by the residual factor $\epsilon_{i,t}$. However, note that $E(\epsilon_{i,t}) = 0$.

[Insert Figure 4 about here]

At the same time, the fraction of global CO₂ emissions covered by our sample of reporting companies increases from 3% in 2003 to 24% in 2020, see the solid line in Figure 4.¹⁰ Thus, especially in the later part of the sample, CO₂ reductions signalled by increased climate talk in earnings calls also appear to be meaningful in aggregate.

5.2.2 Reductions in CO₂ emissions by scope

Table 4 focuses on emissions of different scopes, which helps explain how exactly climate-talking firms are reducing their CO₂ footprint - either directly or indirectly. We find that the overall reduction is mainly driven by the change in Scope 2 emissions, which are indirect emissions that stem from the purchase of electricity, steam, heat or cooling. It is notable that nearly 40 percent of global GHG emissions stem from electricity use (Sotos, 2015). These findings hold for the call-level measure of climate talk (Panel A), and are again particularly pronounced for climate talk in the Q&A part of the earnings call (Panels B and C). We do not find significant reduction for Scope 1 emissions, which are direct emissions from sources owned or controlled by the firm, such as those associated with fuel combustion in boilers, furnaces, vehicles, and so on. Similarly we do not find a significant reduction in Scope 3 emissions, which are linked to the supply chain and customer application.

[Insert Table 4 about here]

Taken together, we observe that firms do reduce their carbon footprint, in the wake of talking about climate-related issues in a quarterly earnings call. Specifically, there seems to be a negative association between the level of talk about climate-related issues in the analyst call and the future change in CO₂ emission levels.

¹⁰ Global CO₂ emissions are from the Global Carbon Project, see Friedlingstein et al. (2021) for details

5.2.3 Which firms walk the talk?

In cross-sectional tests, we examine how different characteristics moderate the effect of climate talk on CO₂ emissions. First, we consider the Asset 4 environmental pillar score to compare firms with high and low environmental ratings. Second, we use the corporate governance score to compare well and poorly governed firms. Third, we use a combined ESG score. These results are tabulated in Table 5.

A clear picture emerges. We only find a significant effect for climate talk in the Q&A part of the earnings call for firms in the *high* environmental score or governance score sub samples. In other words, the climate talk in the Q&A session is only credible and followed by a reduction in CO₂ emissions in well-governed firms or firms with a track record of good environmental ratings.

[Insert Table 5 about here]

5.3 Stock market reactions to climate talk

Our second test of the relevance of climate talk on earnings calls is to examine stock market reaction during the announcement window on the day of the earnings call and on the following business day. To calculate abnormal returns, we subtract from each stock's return the stock market return for developed stock markets from Kenneth French's website as a proxy for the performance of the market portfolio.

Overall, we find that the announcement returns are negatively correlated with climate talks in the full cross-section of firms - see Column (1). In Column (2), we disentangle the climate talk based on the presentation and the Q&A-section and find a negative association for both parts of the call, which initially supports Hypothesis 2b.

[Insert Table 6 about here]

However, further tests reveal that these critical shareholder reactions are driven by firms where shareholders may be reasonably sceptical about climate talk. For example, Column (3) shows that the negative response is particularly strong in firms with low ESG scores, that is, firms where climate talk is arguably less credible. This holds separately for environmental and governance quality, as seen in Columns (4) and (5). Moreover, the negative reaction is particularly pronounced in the sub-sample of firms with negative earnings surprises (Column (6)), suggesting that climate talk is seen as a luxury good by those investors who pay attention to the earnings call. (The complementary sample results, on high ESG score firms and positive earnings surprise firms, are not shown due to space constraints, but reveal that climate talk is rarely associated with market reactions for these firms.)

5.4 Determinants of climate talk

Given our findings in the previous section, at least in the short run stock market reactions alone are unlikely to motivate firms to increase climate talk in their earnings calls. Consequently, this section investigates other potential determinants. Specifically, we examine three different drivers: (1) being targeted by the Climate Action 100+ initiative, which we use as a proxy for pressure from climate-focused investors, (2) publicly declaring support for the TCFD as a signal of preparedness, and (3) being in an industry for which climate change-related issues are deemed highly material.

The first driver is the firm's business model and the industry in which the firm operates. For this analysis, we use the Materiality Map developed by the SASB. It ranks environmental issues on two types of evidence: (1) that investors in a particular industry are interested in the issue and (2) that these issues can have an impact on firms in that industry. We focus on the climate-related aspect of this measure: GHG emissions. Given that materiality is an industry-wide measure, we could not use firm

fixed effects or industry fixed effects in this part of the analysis. Thus, the variable *MATERIALITY* is equal to one if the SASB considers GHG emissions material for a firms in a given industry.

The second driver is the preparedness of the firm to talk about climate-related issues. With its framework and guidance, the TCFD should help firms prepare their carbon- and climate-related disclosure. Hence, we code the variable *TCFD* as one if the company publicly supports the TCFD framework and zero if the firm has not publicly endorsed it.¹¹ We obtain a list direct from TCFD and merge the lists based on ISIN numbers.¹²

The third driver of climate-related disclosure entails being targeted by large institutional investors to be nudged towards more voluntary environmental disclosure. One such initiatives is the Climate Action 100+ program, which targets the largest corporate GHG emitters. Again, we obtained the list of targeted firms directly from the initiative and merged the list based on ISIN numbers. The original list, published in 2017, contained 100 firms. A further 61 companies were added to the list in June 2018. The variable *CLIMATECOMP100* is equal to one after the company has been targeted by the Climate Action 100+ program and hence there is some time variation.

In addition to the above-mentioned drivers, we also include potential explanatory variables based on standard control variables: (1) earnings surprise (*POSITIVE_SURPRISE*) measured as the difference between the actual earnings and what analyst would have expected, (2) company size *ln_SIZE*, (3) book-to-market *ln_BM*, (4) profitability (*ROA*), (5) leverage (*LEVERAGE*), (6) intensity of property, plants and equipment *SCALED_PPE*, and (7) investments of the firms (*SCALED_CAPEX*).

¹¹ TCFD supporters are expected to apply the guidelines, according to the TCFD website. So far, 2,800 companies are listed as supporters.

¹² We acknowledge that a broader measure, such for example, if a firm applies a Sustainability report, might have been an alternative. We have decided, however, to have a more narrow focus on climate-related issues.

We also include year fixed effects. All the variables are defined in Table 1.

We start by examining the relation between climate-related disclosure and the various determinants. Specifically, we estimate the parameters of the following regression model:

$$CT = \alpha_i + \alpha_t + \beta_1 CLIMATECOMP100_t + \beta_2 TCFD_t + \beta_3 MATERIALITY_t + \beta_j CSR_{i,t}^j + \beta_k FirmChars_{i,t}^k \quad (2)$$

Table 7 shows the results of our primary investigation into the different factors that might drive the disclosure of climate-related issues in the earnings calls. First, we find that materiality is positively associated with climate talk in all parts of the earnings calls - see significant coefficients in columns (1)-(4). This is in line with our Hypothesis 3a that the materiality of climate-related issues (GHG emissions) to firm value stimulates climate talk by both internal and external participants in earnings calls.

Furthermore, we find that firms that supports the TCFD framework are significantly positively associated with two out of four measures: the overall call measure and the measure based on the presentation. This supports our Hypothesis 3b to the extent that adopting general climate-related disclosure guidelines facilitates climate talk in the part of the earnings call that is under the company's control (the presentation section).

Third, we find empirical evidence that the firms targeted by the Climate Action 100+ initiative talk more about climate-related issues in their earnings calls. Climate Action 100+ has become one of the largest global investor engagement initiatives on climate change, and its influence and impact are growing. Our results are in line with Hypothesis 3c and document that shareholder pressure on businesses to address

climate change issues is positively associated with discussion of climate-related issues throughout all parts of the earnings call.

Concentrating on managerial climate talk either in presentations or answers, we find that *POLICYEMISSIONS*, *TARGETEMISSIONS*, *CSR_INCENTIVES*, and *CSR_REPORTING* enter positively and statistically significantly. Thus, managers whose firms have a policy for reducing emissions in place exhibit more climate talk, especially if it is coupled with setting specific targets for the reduction. Interestingly, firms that additionally specify the year for achieving their targets do not engage in more climate talk in the presentation part but do so in the Q&A, suggesting that analysts are more likely to ask about climate-related issues if the company commits to a deadline. When managerial incentives are linked to CSR targets, there is also more climate talk on earnings calls, both by managers and by analysts. Finally, the coefficients on the control variables are plausible. They suggest, for example, that larger companies and those with higher market-to-book ratios engage in more climate talk.

[Insert Table 7 about here]

Taken together, these results suggest that a combination of external and internal factors drives firms' propensity to talk about climate change in earnings calls. Among the factors that shareholders and other stakeholders could potentially influence, CSR incentives for management as well as setting specific emissions reduction targets appear most significant.

6 Conclusions

There is mounting evidence that climate change is disrupting ecosystems and societies. The transition to a climate-friendly economy will be costly for firms but also

generate significant opportunities. In this paper, we have investigated whether publicly listed firms talk about climate issues in their quarterly earnings calls, whether the occurrence of climate talks in earnings calls has changed over time, which factors make companies more prone to talk about climate change in their quarterly earnings calls, and whether climate-related talk is associated with changes in the level of corporate CO₂ emissions. We have four main findings:

First, our global sample shows only a limited fluctuation in the occurrence of climate talks in earnings calls, until 2019 when there was a sharp increase. Our empirical findings indicate that three sectors are leading when it comes to climate talk: (1) Renewable Resources & Alternative Energy, (2) Resource Transformation, and (3) Extractives & Minerals Processing.

Second, we find empirical evidence that an increase in climate-related talk is positively associated with a reduction in CO₂ emission in the year after the earnings call. This result is consistent with the notion that executives are not just producing hot air by talking about climate-related issues but also transforming their words into action by reducing their CO₂ emissions. Interestingly, the climate talk in the Q&A session is more credible and followed by stronger reductions in CO₂ emissions in well-governed firms and in firms with a track record of good environmental ratings. This suggests that climate talk can indeed signal a serious approach to climate action, but can also be “hot air”.

Third, we also find that climate-related talk is negatively associated with stock market reaction during the announcement period and that this is a potential explanation for the reluctance of managers to talk about climate-related issues during the call. Interestingly, further analysis reveals that investors are particularly critical of climate talk by firms with low ESG scores and poor governance scores or when climate talk follows negative earnings surprises. Given that managers take stock price feedback into account, these results suggest that financial market mechanisms alone

are unlikely to encourage companies to increase the amount of climate talk in earnings calls.

Fourth, companies are more prone to talk more about climate change in the earnings call if they are in a sector for which climate change is highly material, if they are targeted by a climate-focused investor coalition (in this case Climate Action 100+), or if they have endorsed the TCFD climate disclosure standards.

Overall, these results suggest that it can pay for investors and other stakeholders interested in corporate climate actions to pay carefully attention to discussions on climate change in earnings calls.

One limitation of our study is that our sample based on CO₂ emissions is relatively small compared to the original sample we started with. Moreover, we were only able to study firms for which there was a transcript of the earnings call available. Therefore, we were unable to examine the predominately smaller firms with no analyst following or the non-listed firms that often make up a large fraction of the economy. Understanding those firms' climate actions should be an important topic for further research.

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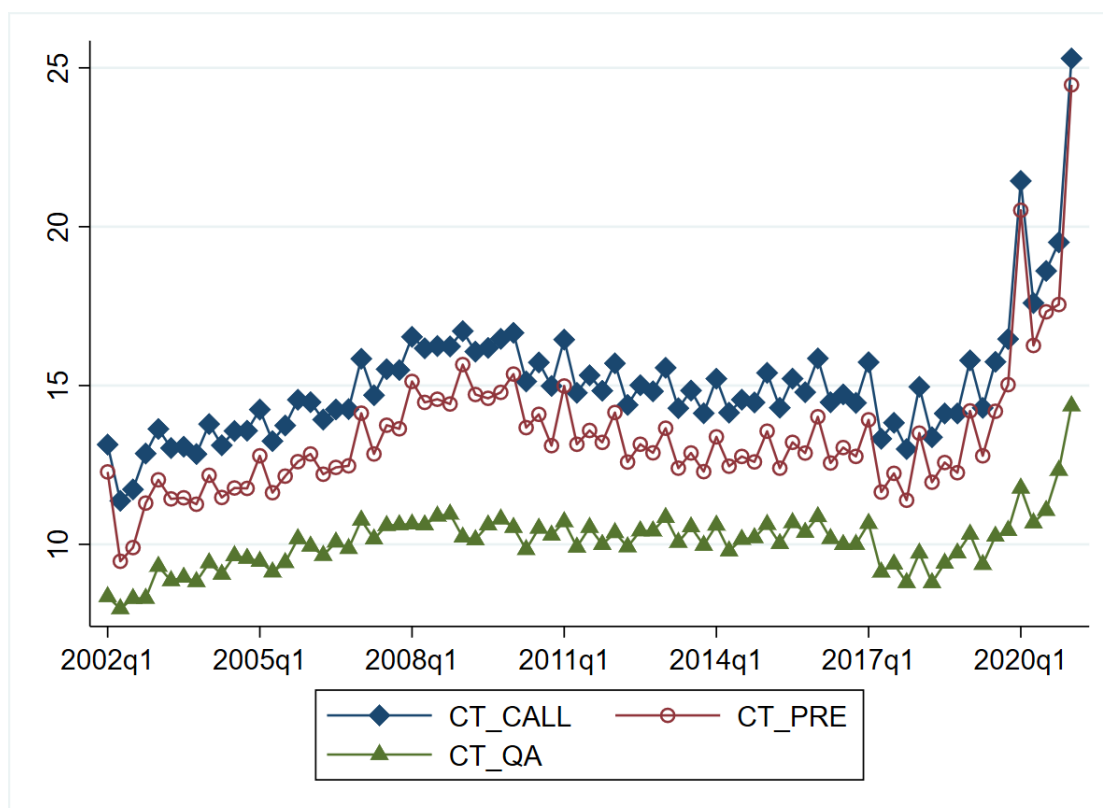
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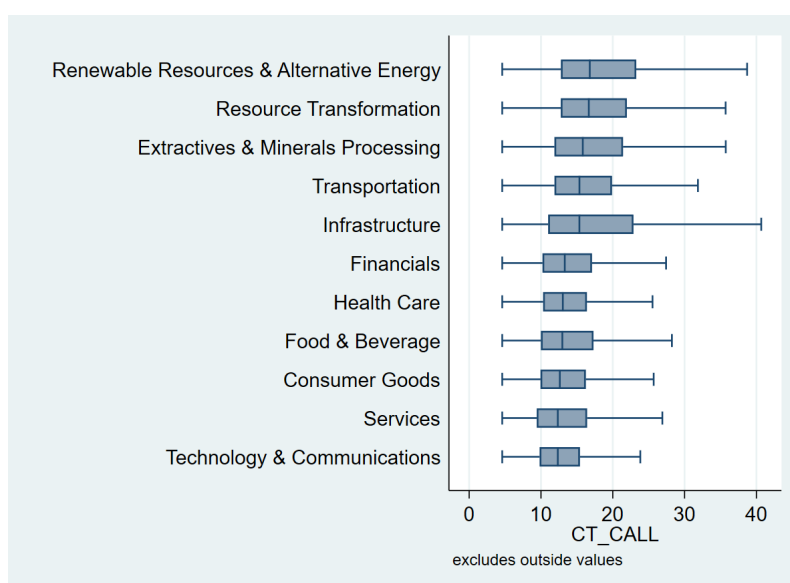
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Figure 1: Climate Talk Over Time



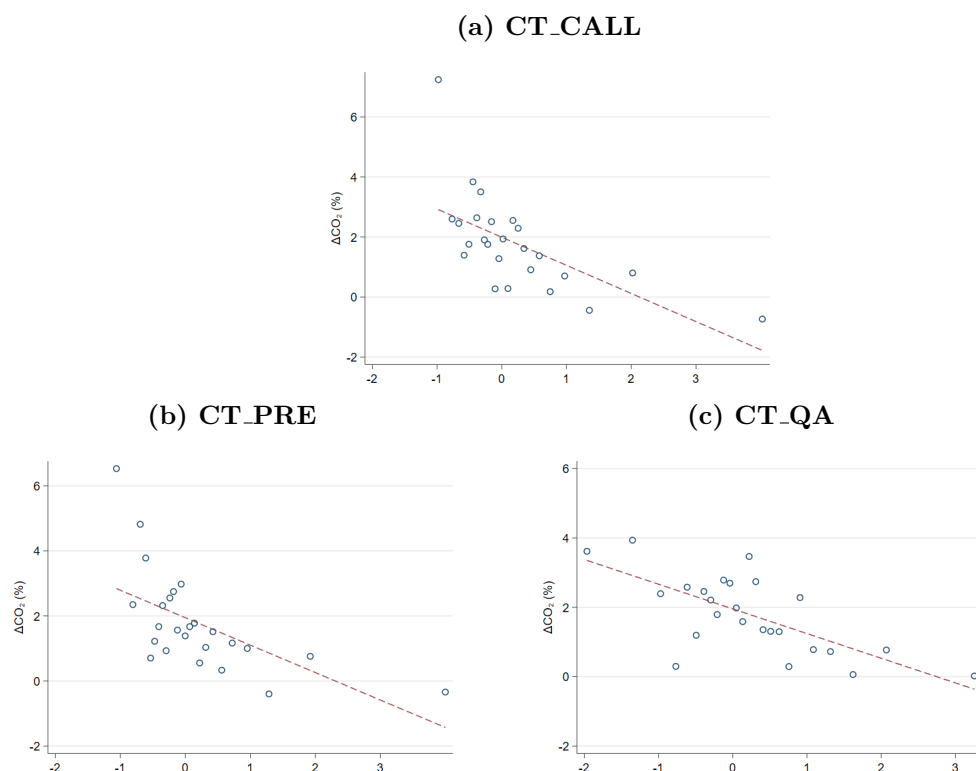
Notes: This figure shows average amounts of climate talk (*CT*) in earnings calls in each calendar quarter between 2002 and 2021Q1. *CT* is measured as the textual similarity between call transcripts and a reference library of texts focused on climate change (IPCC reports) - see Section 4 for details. *CT* is calculated for the entire call (*CT_CALL*) as well as for the presentation and the Q&A sections separately (*CT_PRE*, *CT_QA*).

Figure 2: Climate Talk Across Industries



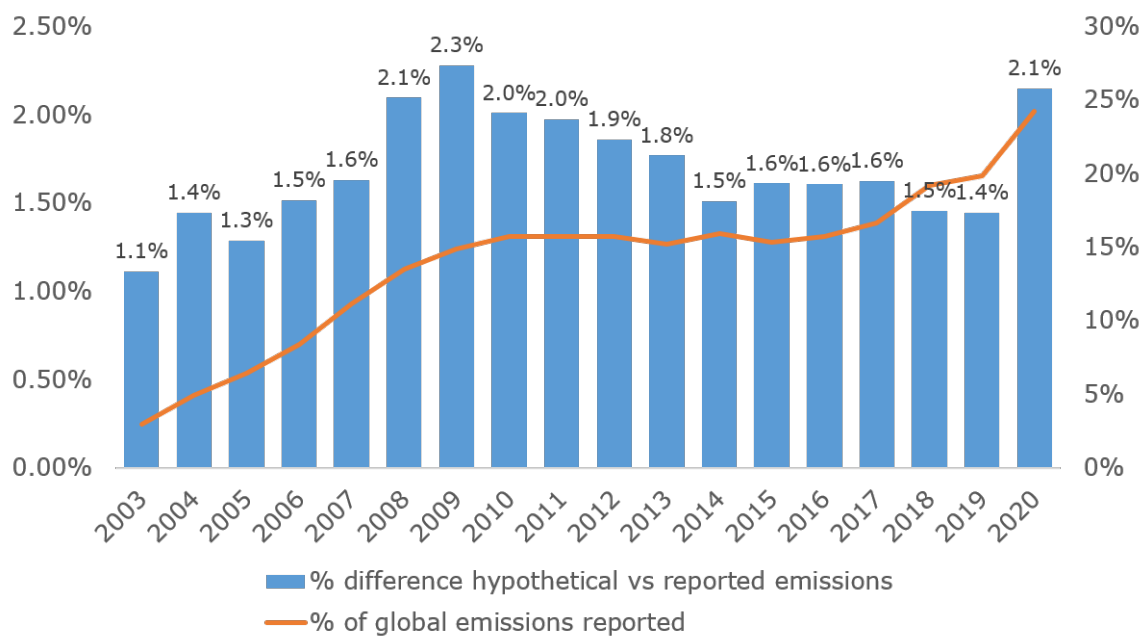
This figure shows the distribution of climate talk (*CT*) in earnings calls across economic sectors, defined according to the Sustainable Industry Classification System. Each box in the graphs shows the interquartile range (25-75) for a given sector with the median highlighted, while the tips of the whiskers are set at 1.5 times the inter-quartile range (values outside these bounds are excluded).

Figure 3: Climate Talk and Changes in CO₂ Emissions



This figure presents binned scatter plots, which show the change in CO₂ emissions in year $t + 1$ depending on the average level of climate talk (CT) in year t . Panel (a) shows the changes in CO₂ emissions associated with climate talk on the entire call (CT_CALL) while Panels (b) and (c) focus on the presentation (CT_PRE) and Q&A (CT_QA) sections respectively. In all Panels, CT is standardized to mean 0 and a standard deviation of 1.

Figure 4: Aggregate Hypothetical vs. Reported CO₂ Emissions



The vertical bars in this figure show, on the left axis, the percentage difference between hypothetical CO₂ emissions that would have occurred in the absence of any climate talk (*CT*) in earnings calls and the actual emissions reported by the same companies in a given year. Hypothetical emissions are calculated following Eskander & Fankhauser (2020) - see Section 5.2 for details. The solid line shows, on the right axis, the proportion of global CO₂ emissions covered by companies in our sample. Data on global CO₂ emissions are from the Global Carbon Budget 2021.

Table 1: Variable Definitions

Variable	Description	Source
CT_{CALL}	The overall call measure based on the textual similarity of an earnings call transcript to the IPCC benchmark as the cosine similarity between the $tf-idf$ vector of the transcripts and the $tf-idf$ vector obtained from the IPCC reports. This measure is based on the full earnings call.	Own Calculations
CT_{PRE}	This measure is based only on the presentation part of the call.	Own Calculations
CT_Q	This measure is based only on the questions asked during the call.	Own Calculations
CT_A	This measure is based only on the answers to analyst questions of the call.	Own Calculations
CAR	Cumulative Abnormal Return over [0:1] days relative to the call, in %.	Own Calculations
$POLICYEMISSIONS$	This variable is equal to 1 if the company had a policy for reducing future greenhouse-gas emissions (according to Asset4 analysts), and 0 otherwise	Asset4
$TARGETEMISSIONS$	This variable is equal to 1 if the company has set a target for reduction in greenhouse-gas emissions, and 0 otherwise	Asset4
$TARGETYEAR$	This variable is equal to 1 if the company has set a year for reaching its target for reduction in greenhouse-gas emissions, and 0 otherwise	Asset4
$CLIMATECOMP100$	This variable is equal to one for firms that are part of the Climate Action 100+ program which nudges firms to increase their climate-related disclosure; otherwise zero.	From the organisation.
$TCFD$	This variable is equal to one if the company applies the Task Force on Climate-related Financial Disclosures (TCFD) framework and zero if the firm does not.	From the organisation.
$MATERIALITY$	The variable is equal to one if the Sustainability Standards Accounting Board considers greenhouse-gas emissions material for companies in a given industry	SASB
$CSR_INCENTIVE$	is equal to one if the firms management has a variable incentive that is linked to CSR.	Asset4
CSR_AUDIT	is equal to one if the firm has an audit of its CSR report.	Asset4
$CSR_COMMITTEE$	is equal to one if the board of directors has a CSR committee.	Asset4
$CSR_REPORTING$	is equal to one if the firm has a corporate sustainability report.	Asset4
$POSITIVE_SURPRISE$	Quarterly earnings surprise, calculated as the difference in actual quarterly earnings minus the most recent mean forecasted quarter earnings.	IBES
\ln_SIZE	Logarithm of market value of equity.	Eikon
\ln_BM	Book-to-market-ratio.	Eikon
ROA	Return on Assets	Eikon
$LEVERAGE$	Book leverage	Eikon
$SCALED_PPE$	Property, Plants and Equipment scaled by total assets.	Eikon
$SCALED_CAPEX$	CAPEX scaled by total assets.	Eikon

Table 2: Summary Statistics

The descriptive statistics are based on 85,829 firm-quarters in the period 2002-2021:Q1. The variables are defined in Table 1. We report the number of observations, mean and standard deviation (Std.), as well as the Minimum, and Maximum and the three quartiles. All variables other than the call measures have been winsorized at the 1st and 99th percentile.

	N	Mean	SD	Minimum	Q1	Median	Q3	Maximum
<i>CT_{CALL}</i>	85 829	15.80	10.29	4.60	10.45	13.57	17.87	88.39
<i>CT_{PRE}</i>	85 829	13.54	10.28	1.09	8.31	11.38	15.58	90.79
<i>CT_{QA}</i>	85 829	10.98	6.36	0.00	7.06	9.92	13.50	40.45
<i>CAR</i>	85 829	0.24	6.92	-21.13	-3.25	0.15	3.71	21.74
ΔCO_2	15 912	1.78	24.64	-62.53	-8.20	-1.18	6.34	222.32
ΔCO_2 Scope 1	12 760	4.36	35.16	-73.41	-8.79	-0.61	8.37	380.33
ΔCO_2 Scope 2	12 585	1.24	29.21	-74.88	-10.36	-1.96	6.43	280.44
ΔCO_2 Scope 3	7 782	109.06	708.47	-89.90	-10.03	1.07	17.83	10737.50
<i>ENVIRONMENTAL SCORE</i>	15 907	58.00	22.51	0.03	42.14	60.23	76.54	99.11
<i>EMISSION SCORE</i>	15 906	66.88	23.74	0.17	50.57	70.99	86.91	99.89
<i>GOVERNANCE SCORE</i>	15 912	60.61	20.62	0.45	45.34	63.21	77.24	99.38
<i>CLIMATECOMP100</i>	85 829	0.01	0.09	0.00	0.00	0.00	0.00	1.00
<i>TCFD</i>	85 829	0.01	0.12	0.00	0.00	0.00	0.00	1.00
<i>MATERIALITY</i>	85 829	0.47	0.50	0.00	0.00	0.00	1.00	1.00
<i>POSITIVE SURPRISE</i>	85 829	0.64	0.48	0.00	0.00	1.00	1.00	1.00
<i>POLICY EMISSIONS</i>	85 829	0.53	0.50	0.00	0.00	1.00	1.00	1.00
<i>TARGET EMISSIONS</i>	85 829	0.33	0.47	0.00	0.00	0.00	1.00	1.00
<i>TARGET YEAR</i>	85 829	0.12	0.32	0.00	0.00	0.00	0.00	1.00
<i>CSR INCENTIVE</i>	85 829	0.20	0.40	0.00	0.00	0.00	0.00	1.00
<i>CSR AUDIT</i>	85 829	0.21	0.41	0.00	0.00	0.00	0.00	1.00
<i>CSR COMMITTEE</i>	85 829	0.46	0.50	0.00	0.00	0.00	1.00	1.00
<i>CSR REPORTING</i>	85 829	0.49	0.50	0.00	0.00	0.00	1.00	1.00
<i>ln SIZE</i>	85 829	22.44	1.73	18.30	21.29	22.36	23.52	27.45
<i>ln BM</i>	85 829	1.55	0.58	0.77	1.21	1.40	1.70	4.82
<i>ROA</i>	85 829	3.07	11.17	-53.09	0.90	3.79	7.83	28.70
<i>LEVERAGE</i>	85 829	0.80	1.75	-6.03	0.15	0.49	1.03	10.49
<i>SCALED_PPE</i>	85 829	0.50	0.44	0.00	0.12	0.35	0.81	1.90
<i>SCALED_CAPX</i>	85 829	-0.05	0.05	-0.25	-0.06	-0.03	-0.01	0.00

Table 3: Climate Talk and Reduction in CO₂

The dependent variable is the change in CO₂ emission. All variables are defined in Table 1. We estimate panel regressions. We include but do not tabulate year fixed effects in each model, as indicated in the table. *t*-statistics, calculated based on standard errors clustered at the firm level, are in parentheses below the coefficients. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels.

	(1) ΔCO_2	(2) ΔCO_2	(3) ΔCO_2	(4) ΔCO_2	(5) ΔCO_2
<i>CT_{CALL}</i>	-0.815*** (-2.88)	-0.610* (-2.00)			
<i>CT_{PRE}</i>			-0.448 (-1.61)		-0.278 (-1.13)
<i>CT_{QA}</i>				-0.674** (-2.40)	-0.597** (-2.36)
<i>CSR_REPORTING</i>		-0.343 (-0.35)	-0.350 (-0.36)	-0.399 (-0.40)	-0.371 (-0.37)
<i>CSR_AUDIT</i>		-1.225* (-2.04)	-1.249* (-2.09)	-1.254* (-2.06)	-1.241* (-2.05)
<i>CSR_INCENTIVE</i>		-1.654*** (-3.32)	-1.684*** (-3.37)	-1.641*** (-3.25)	-1.604*** (-3.16)
<i>CSR_COMMITTEE</i>		0.062 (0.08)	0.069 (0.09)	0.012 (0.02)	0.031 (0.04)
<i>POLICYEMISSIONS</i>		-0.349 (-0.41)	-0.341 (-0.40)	-0.346 (-0.41)	-0.350 (-0.42)
<i>TARGETSEMISSIONS</i>		-2.588*** (-4.40)	-2.608*** (-4.46)	-2.605*** (-4.40)	-2.586*** (-4.36)
<i>TARGETYEAR</i>		-1.090* (-2.05)	-1.088* (-2.05)	-1.048* (-1.97)	-1.060* (-1.98)
<i>CLIMATECOMP100</i>		1.522 (1.19)	1.424 (1.18)	1.425 (1.14)	1.521 (1.16)
<i>ln_SIZE</i>	-0.793** (-2.53)	0.163 (0.44)	0.116 (0.31)	0.260 (0.67)	0.258 (0.66)
<i>ln_BM</i>	-0.752*** (-3.27)	-0.822*** (-3.14)	-0.807*** (-3.09)	-0.847*** (-3.21)	-0.856*** (-3.24)
<i>ROA</i>	0.628 (1.39)	0.677 (1.37)	0.658 (1.34)	0.695 (1.39)	0.695 (1.40)
<i>LEVERAGE</i>	-0.079 (-0.41)	-0.087 (-0.47)	-0.082 (-0.44)	-0.082 (-0.45)	-0.083 (-0.45)
<i>SCALED_PPE</i>	-1.941*** (-4.83)	-1.667*** (-3.75)	-1.674*** (-3.79)	-1.666*** (-3.70)	-1.667*** (-3.72)
<i>SCALED_CAPX</i>	-1.772*** (-4.20)	-1.776*** (-3.85)	-1.790*** (-3.89)	-1.768*** (-3.82)	-1.760*** (-3.80)
Constant	2.454*** (46.62)	5.249*** (4.17)	5.247*** (4.16)	5.341*** (4.31)	5.312*** (4.25)
Observations	13,459	12,907	12,907	12,907	12,907
R-squared	0.028	0.032	0.032	0.032	0.032
Fixed Effect	Industry & Year	Industry & Year	Industry & Year	Industry & Year	Industry & Year

Table 4: Climate Talk and Reduction in the Scope of CO₂

The dependent variables are the change in CO₂ emission based on Scope 1 in column (1), Scope 2 in column (2), and Scope 3 in column (3). In Panel A, we report the results for the baseline regressions (not controlling for other CSR characteristics) on the overall call level. In Panel B, we report the results from the baseline regression but include the presentation and the Q&A variables, separately. In Panel C, we also include additional CSR controls. All variables are defined in Table 1. We estimate panel regressions. We include but do not tabulate year fixed effects in each model, as indicated in the table. *t*-statistics, calculated based on standard errors clustered at the firm level, are in parentheses below the coefficients. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels.

Change in: <i>CO</i> ₂	(1) Scope 1	(2) Scope 2	(3) Scope 3
Panel A. Baseline regression: Call Level			
<i>CT</i> _{CALL}	-0.532 (-1.08)	-0.867** (-2.29)	5.019 (0.80)
CSR Controls	No	No	No
Firm Characteristics	Yes	Yes	Yes
Observations	10,540	10,232	6,175
R-squared	0.022	0.027	0.019
Panel B. Baseline regression: Presentation vs. Q&A			
<i>CT</i> _{PRE}	-0.273 (-0.51)	-0.359 (-1.11)	3.959 (0.93)
<i>CT</i> _{QA}	-0.488 (-1.00)	-0.796* (-1.90)	-2.022 (-0.22)
CSR Controls	No	No	No
Firm Characteristics	Yes	Yes	Yes
Observations	10,540	10,232	6,175
R-squared	0.023	0.028	0.019
Panel C. Full Model controlling for CSR characteristics			
<i>CT</i> _{PRE}	-0.094 (-0.17)	-0.109 (-0.33)	4.271 (0.67)
<i>CT</i> _{QA}	-0.422 (-0.85)	-0.790* (-1.74)	-0.901 (-0.08)
CSR Controls	Yes	Yes	Yes
Firm Characteristics	Yes	Yes	Yes
Observations	10,204	9,947	6,097
R-squared	0.026	0.031	0.020
Fixed Effect	Industry & Year	Industry & Year	Industry & Year

Table 5: Climate Talk and Reduction CO₂. Sample Splits

The dependent variables are the change in CO₂ emission. We revisit the results from Table 3 and split the sample based on the ESG score in columns (1-2). In columns (3-4) we use the environment-score and in columns (5-6) we split the sample based on the the governance scores. All variables are defined in Table 1. We estimate panel regressions. We include but do not tabulate year fixed effects in each model, as indicated in the table. *t*-statistics, calculated based on standard errors clustered at the firm level, are in parentheses below the coefficients. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels.

Split	ESG Score		Environmental Score		Governance Score	
	Low	High	Low	High	Low	High
	(1)	(2)	(3)	(4)	(5)	(6)
CT_{PRE}	-0.646*	0.061	-0.396	-0.155	-0.440	-0.117
	(-1.78)	(0.23)	(-0.92)	(-0.62)	(-1.13)	(-0.33)
CT_{QA}	-0.424	-0.708*	-0.443	-0.677**	-0.497	-0.728**
	(-1.18)	(-1.96)	(-1.20)	(-2.36)	(-1.08)	(-2.53)
CSR Controls	Yes	Yes	Yes	Yes	Yes	Yes
Firm Characteristics	Yes	Yes	Yes	Yes	Yes	Yes
Observations	6,216	6,689	6,239	6,665	6,387	6,520
R-squared	0.031	0.041	0.034	0.040	0.038	0.037
Fixed Effect	Industry & Year	Industry & Year	Industry & Year	Industry & Year	Industry & Year	Industry & Year

Table 6: Climate Talk and Cumulative Abnormal Returns

The dependent variable is the cumulative abnormal return (CAR) on the announcement day of the conference call and the day after. All variables are defined in Table 1. We estimate panel regressions. We include but do not tabulate year fixed effects in each model, as indicated in the table. *t*-statistics, calculated based on standard errors clustered at the firm level, are in parentheses below the coefficients. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels.

	(1) <i>CAR</i> All Firms	(2) <i>CAR</i> All Firms	(3) <i>CAR</i> Low ESG	(4) <i>CAR</i> Low Env	(5) <i>CAR</i> Low Gov	(6) <i>CAR</i> Surp<0
<i>CT_{CALL}</i> (STD)	-0.096*** (-4.22)					
<i>CT_{PRE}</i> (STD)		-0.048** (-2.04)	-0.142** (-2.57)	-0.129** (-2.06)	-0.086* (-1.88)	-0.095*** (-2.58)
<i>CT_{QA}</i> (STD)		-0.110*** (-4.36)	-0.168*** (-3.40)	-0.204*** (-3.89)	-0.120*** (-2.72)	-0.130*** (-3.12)
<i>SURPRISE</i>	0.262*** (12.21)	0.262*** (12.21)	0.572*** (7.60)	0.469*** (6.67)	0.372*** (8.03)	0.000 (0.02)
<i>CLIMATECOMP100</i>	0.158 (0.78)	0.186 (0.92)	-0.993 (-0.74)	-0.460* (-1.86)	-0.319 (-0.62)	-0.159 (-0.52)
<i>TCFD</i>	0.086 (0.61)	0.074 (0.52)	0.417 (0.42)	0.509 (1.34)	-0.048 (-0.13)	-0.052 (-0.21)
<i>MATERIALITY</i>	0.108* (1.74)	0.120* (1.92)	0.106 (0.94)	0.108 (0.89)	0.100 (0.96)	0.423*** (3.68)
<i>POLICYEMISSIONS</i>	-0.117 (-1.51)	-0.114 (-1.48)	-0.065 (-0.53)	-0.085 (-0.67)	-0.174 (-1.53)	-0.209 (-1.43)
<i>TARGETSEMISSIONS</i>	-0.029 (-0.39)	-0.025 (-0.35)	0.222 (1.21)	0.461* (1.84)	-0.054 (-0.44)	-0.326** (-2.46)
<i>TARGETYEAR</i>	-0.247** (-2.52)	-0.242** (-2.47)	-0.303 (-0.87)	-0.974** (-2.41)	-0.027 (-0.15)	0.046 (0.26)
<i>CSR_INCENTIVE</i>	-0.032 (-0.54)	-0.024 (-0.41)	0.089 (0.70)	-0.075 (-0.59)	-0.012 (-0.10)	-0.233** (-2.15)
<i>CSR_AUDIT</i>	0.066 (1.04)	0.066 (1.03)	-0.012 (-0.04)	-0.693** (-2.10)	0.050 (0.45)	0.640*** (5.38)
<i>CSR_COMMITTEE</i>	-0.028 (-0.44)	-0.028 (-0.44)	-0.079 (-0.73)	-0.068 (-0.60)	0.001 (0.01)	0.068 (0.53)
<i>CSR_REPORTING</i>	-0.143* (-1.91)	-0.139* (-1.85)	-0.049 (-0.37)	-0.103 (-0.71)	-0.166 (-1.46)	0.536*** (3.71)
<i>ln_SIZE</i>	-0.001 (-0.04)	0.007 (0.20)	-0.112* (-1.87)	-0.023 (-0.39)	-0.039 (-0.70)	0.677*** (10.89)
<i>ln_BM</i>	-0.332*** (-10.58)	-0.339*** (-10.73)	-0.408*** (-8.27)	-0.432*** (-8.02)	-0.401*** (-8.34)	-0.384*** (-7.43)
<i>ROA</i>	0.360*** (10.40)	0.361*** (10.43)	0.421*** (9.90)	0.395*** (9.35)	0.379*** (8.94)	-0.025 (-0.48)
<i>LEVERAGE</i>	-0.060** (-2.10)	-0.059** (-2.09)	-0.021 (-0.47)	-0.014 (-0.30)	-0.043 (-1.07)	-0.023 (-0.42)
<i>SCALED_PPE</i>	-0.018 (-0.56)	-0.019 (-0.59)	-0.027 (-0.50)	-0.036 (-0.61)	0.016 (0.29)	-0.008 (-0.14)
<i>SCALED_CAPX</i>	0.058* (1.78)	0.060* (1.86)	0.009 (0.19)	0.001 (0.03)	0.080 (1.62)	-0.144** (-2.52)
Constant	0.361*** (8.03)	0.353*** (7.83)	0.284*** (4.70)	0.316*** (5.26)	0.381*** (6.05)	-2.275*** (-26.25)
Observations	82,494	82,494	38,997	38,419	39,768	29,074
R-squared	0.011	0.011	0.014	0.012	0.011	0.019
Fixed Effect	Year	Year	Year	Year	Year	Year

Table 7: Determinants of Climate Talk

This table presents regression results for Equation 2. The dependent variables are the different call measures (CT_{CALL}), which is the climate-talk measure for the entire call and is shown in column (1). The results for the different subparts of the earnings call are available in column (2) for the presentation, in column (3) for the questions and in column (4) for the answers. All our variables are defined in Table 1. We estimate panel regressions. We include but do not tabulate year fixed effects in each model, as indicated in the table. t -statistics, calculated based on standard errors clustered at the firm level, are in parentheses below the coefficients. ***, **, and * denote significance at the 1%, 5%, and 10% (two-sided) levels.

Climate Talk	(1) Call (CT_{CALL})	(2) Presentation (CT_{PRE})	(3) Questions (CT_Q)	(4) Answers (CT_A)
<i>CLIMATECOMP100</i>	8.325*** (5.86)	7.020*** (4.95)	3.336*** (3.53)	3.743*** (5.94)
<i>TCFD</i>	2.813*** (3.10)	2.657*** (2.83)	0.218 (0.34)	0.146 (0.35)
<i>MATERIALITY</i>	4.326*** (17.50)	3.910*** (15.57)	2.278*** (9.60)	1.931*** (12.30)
<i>POSITIVE_SURPRISE</i>	-0.070 (-0.80)	-0.068 (-0.76)	0.423*** (5.08)	0.157*** (2.74)
<i>POLICYEMISSIONS</i>	0.834*** (3.68)	0.830*** (3.55)	-0.064 (-0.29)	0.310** (2.08)
<i>TARGETSEMISSIONS</i>	1.339*** (4.31)	1.437*** (4.54)	0.444 (1.54)	0.515*** (2.69)
<i>TARGETYEAR</i>	0.508 (1.64)	0.478 (1.52)	0.609** (2.28)	0.433** (2.33)
<i>CSR_INCENTIVE</i>	1.619*** (7.04)	1.562*** (6.58)	0.666*** (3.25)	0.961*** (6.97)
<i>CSR_AUDIT</i>	-0.012 (-0.04)	-0.503* (-1.65)	-0.059 (-0.22)	-0.019 (-0.10)
<i>CSR_COMMITTEE</i>	0.140 (0.65)	0.105 (0.49)	0.164 (0.76)	-0.032 (-0.23)
<i>CSR_REPORTING</i>	0.866*** (3.67)	0.593** (2.57)	0.368* (1.71)	0.541*** (3.53)
<i>ln_SIZE</i>	0.511*** (6.90)	0.335*** (4.56)	0.788*** (11.01)	0.444*** (9.66)
<i>ln_BM</i>	-0.540*** (-4.23)	-0.181 (-1.39)	-0.893*** (-7.34)	-0.851*** (-10.27)
<i>ROA</i>	-0.017*** (-3.28)	-0.027*** (-5.04)	0.035*** (6.66)	-0.000 (-0.06)
<i>LEVERAGE</i>	-0.052 (-1.39)	-0.023 (-0.56)	-0.004 (-0.13)	-0.029 (-1.27)
<i>SCALED_PPE</i>	-1.170*** (-3.30)	-1.125*** (-3.03)	-0.590** (-2.36)	-0.622*** (-3.40)
<i>SCALED_CAPX</i>	1.686 (0.72)	-0.122 (-0.05)	10.272*** (6.44)	3.604*** (3.02)
Constant	0.445 (0.22)	2.465 (1.21)	-4.179** (-2.00)	-0.756 (-0.60)
Observations	85,829	85,829	85,829	85,829
R-squared	0.128	0.096	0.068	0.102
Fixed Effect	Year	Year	Year	Year