

Climate Talk in Conference Calls

Impact on Analyst Forecasts and Corporate Environmental Management

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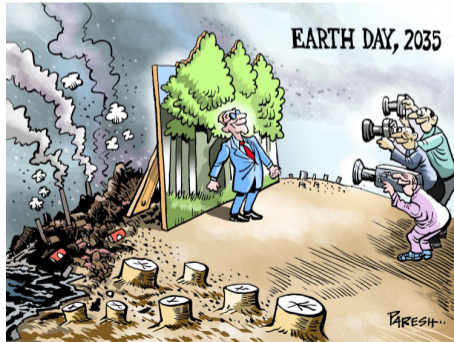
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Motivation

Firms have a **preference** to **TALK** about climate change

- Green reputation and green trust (*Chen (2010), Homburg et al. (2013)*); Regulatory and stakeholder pressures (*Ilhan et al. (2023)*); Greenwashing (*Cho et al. (2013), Coen et al. (2022)*)



Motivation

Firms have a **preference** to **TALK about climate change**

Climate Talk: valuable information v.s. “cheap talk”

- Interpretation of corporate climate talk by key stakeholders

Research Questions

1. What is the impact of **corporate climate talk** on **analyst forecasting performance**?

- Information Asymmetry Theory & Impression Management Theory
 - Information gaps between executives and analysts may lead corporations to use climate talk to shape analysts' perceptions
 - analysts struggle to incorporate climate-related elements accurately into their forecasts
- ⇒ H1: Executive's climate talk has a **negative** impact on analysts' forecasting performance.

Research Questions

2. Whether, and to what degree, do the **analysts' climate concerns** influence **corporate environmental management**?

- Market discipline
 - information intermediaries between companies and investors
 - analysts' climate questions can be viewed as a reflection of societal expectations
 - ⇒ H2: Financial analysts climate attention have a **positive** impact on corporate environmental engagement.

Paper positioning

Corporate communication

- E.g., impact on corporate reputation, and stakeholder relationships (Williams & Siegel, 2017; Cho et al., 2015; Dupire & M'Zali, 2018), impact on stakeholder perceptions and the organization's legitimacy (Merkl-Davies & Brennan, 2007; Bitektine, 2011); earnings calls (Hassan et al. 2019; Hassan et al. 2020; Sautner et al. 2022)
- **This paper:** focuses on executives & analysts **climate-related** discussions

Financial analysts forecasting

- E.g., corporate disclosure and forecast accuracy (Bartov & Bodnar, 1994; Kimbrough, 2005; Kim et al., 2014); impact of environmental data on shaping analysts' forecasts (Luo et al., 2015; Cheng et al., 2014; Benlemlih et al., 2018)
- **This paper:** the effect of corporate climate talk on analysts forecast performance

Determinants of Environmental management

- E.g., Marquis et al., 2016; Flammer, 2021
- **This paper:** the impact of analysts' climate talk on corporate environmental management

Data

- Conference call – Capital IQ
- Sell-side equity analysts forecast – IBES
- Corporate environmental management – S&P Global, Refinitiv
- Firm characteristics – Compustat, CRSP

Climate Talk

- Earnings Conference calls
 - Interactive & public forum
 - Executive presentation + Q&A
 - Analysts can ask questions, and investors can attend
 - Dynamic and more comprehensive communication
 - Compared with press releases or SEC filings
- Climate Talk
 - Textual analysis on executive presentation, analyst questions, and executive answers
 - 8,924 climate change-related bi-grams (e.g., carbon emissions, climate change, extreme weather, physical threats) (*Sautner et al, 2023*)

Climate Talk

- Climate talk dummy: indicator equals to one if the segment (executive's **presentation**, analysts' **question**, executive's **answer**) contains at least one climate change bigram.
- Climate talk frequency

$$CC_Frequency = \frac{\text{Number of climate change bigrams}}{\text{Total bigrams count}}$$

- Climate talk complexity

$$CC_Complexity = \frac{1}{N} \sum_{i=1}^N \text{Gunning Fog Index}(S_i)$$

- where N is the number of sentences containing a climate change bigram and S_i is the i -th sentence.
- if a segment has three sentences contain climate change bigrams with Gunning Fog Index scores of 12, 14, and 10. $CC_Complexity = (12 + 14 + 10) / 3 = 12$.

Climate Talk

- Climate talk subjectivity

$$CC_Subjectivity = \frac{1}{W} \sum_{i=1}^W \text{Subjectivity}(W_i)$$

- where W is the total number of words in the climate-related segment and W_i is the i -th word.
- subjectivity level of words: ranging from 0 (objective) to 1 (subjective)
- if a segment contains the words 'climate', 'is', 'important', 'for', 'future'. Using the Python Pattern library, assume the subjectivity scores are 0, 0, 0.75, 0, and 0.9 respectively.
 $CC_Subjectivity = (0 + 0 + 0.75 + 0 + 0.9) / 5 = 0.33$.

- Climate talk uncertainty

$$CC_Uncertainty = \frac{\text{Count of Uncertainty Words in Climate-Related Discourse}}{\text{Total Word Count}}$$

- Loughran-McDonald uncertainty words

Climate Talk

- Climate Talk Positive Ratio

$$CC_RATIO_POS = \frac{\text{Count of Positive Words in Climate-Related Discourse}}{\text{Total Word Count}}$$

- Climate Talk Negative Ratio

$$CC_RATIO_NEG = \frac{\text{Count of Negative Words in Climate-Related Discourse}}{\text{Total Word Count}}$$

- Climate Talk Sentiment

$$CC_Sentiment = CC_RATIO_POS - CC_RATIO_NEG$$

- Loughran-McDonald positive and negative words

Analyst Forecast Measures

- Forecast Error: precision of analysts' predictions

$$\text{ferror}_{i,t} = |\text{Mean of analysts' estimates}_{i,t} - \text{Actual EPS}_{i,t}|$$

- Forecast Dispersion: analysts' agreement on a firm's future earnings

$$\text{fdispersion}_{i,t} = \text{Standard Deviation of analysts' individual forecast estimates}_{i,t}$$

- Forecast Bias:

- Forecast Optimism

$$\text{foptimism_analyst}_{i,t} = \frac{1}{N_{i,t}} \sum_{n=1}^{N_{i,t}} (1[\text{Analyst's forecast EPS}_{i,t,n} > \text{Actual EPS}_{i,t}])$$

- Forecast Pessimism

$$\text{fpessimism_analyst}_{i,t} = \frac{1}{N_{i,t}} \sum_{n=1}^{N_{i,t}} (1[\text{Analyst's forecast EPS}_{i,t,n} < \text{Actual EPS}_{i,t}])$$

Corporate environmental management

- % change in total CO2 equivalent emissions (Scope 1, Scope 2, Scope 3)
- Environmental management training (dummy)
- Environmental investment initiatives (dummy)
- Environmental expenditure investment (dummy)
- Environmental innovation score
- Environmental management team score

Data & Sample

- **Conference call** (*Executive's presentation, Analysts' questions, Executive's answers*)
 - Climate talk dummy
 - Climate talk frequency
 - Climate talk tone (Subjectivity, Uncertainty, Complexity, Sentiment)
- **Sell-side equity analysts forecast**
 - Forecast error
 - Forecast dispersion among analysts
 - Forecast bias: optimism, pessimism
- **Corporate environmental management**
 - % change in total CO2 equivalent emissions (Scope 1, Scope 2, Scope 3)
 - Environmental management training (dummy)
 - Environmental investment initiatives (dummy), Environmental expenditure investment (dummy), Environmental innovation score, Environmental management team score
- **Sample**
 - 48,329 observations across 6,696 U.S. public firms, from 2005 to 2022

1. Corporate Climate Talk: Impact on Analyst Forecasting performance

$$\text{Analyst Forecast}_{i,t} = \alpha_0 + \alpha_1 \text{Pre_CC_Frequency}_{i,t-1} + \alpha_2 \text{Controls}_{i,t-1} + \gamma_t + \lambda_s + \epsilon_{i,t},$$

- $\text{Controls}_{i,t-1}$: Analyst Coverage, \ln (firm size), Loss, FHorizon, LEV ratio, ROA, CAPX ratio, and \ln (firm age).
- Include both industry-fixed effect and year-fixed effect.
- The sample is clustered at both firm and year levels.

1. Corporate Climate Talk: Impact on Analyst Forecasting performance

Dependent Variable:	Error	Fdispersion	FOptimism_Analyst	FPessimism_Analyst
Pre_CC_Frequency	34.864* (1.872)	30.873* (1.662)	3.068* (2.070)	-3.401** (-2.317)

- Information Asymmetry Theory & Impression Management Theory
 - Information gaps between executives and analysts may lead corporations to use climate talk to shape analysts' perceptions
 - analysts struggle to incorporate climate-related elements accurately into their forecasts
- ⇒ climate talk of executives have a negative impact on analyst forecasting performance

2. Does Analyst Climate Talk Matter? Impact on Corporate Greenness

$$\begin{aligned} \text{Environmental Performance}_{i,t} = & \alpha_0 + \alpha_1 \text{Climate Questions Tone}_{i,t-1} \\ & + \alpha_2 \text{Controls}_{i,t-1} + \gamma_t + \lambda_s + \epsilon_{i,t}, \end{aligned}$$

- *Environmental Performance*_{*i,t*} includes *pcg_Emission*, *Env Innovation Score*, *Env Inv Initiatives*, *Env Mgt Training*, *Env Expenditure Inv*, and *Env Mgt Team Score*
- *Climate Questions Tone*_{*i,t*} includes *q_cc_uncertainty*, *q_cc_ratio_pos*, *q_cc_ratio_neg*, *q_cc_subjectivity*, and *q_cc_complexity*

2. Does Analyst Climate Talk Matter? Impact on Corporate Greenness

- Findings: Companies demonstrate improved environmental performance & management in the subsequent year when:
 - Analysts **ask** climate-related questions during the previous year.
 - Analysts' climate-related questions express **uncertainty**.
 - Analysts' climate-related questions exhibit a **positive or negative sentiment**.
 - Analysts' climate-related questions are **subjective**.
 - Analysts' climate-related questions are **complex**.
- Market discipline
 - information intermediaries between companies and investors
 - analysts' climate questions can be viewed as a reflection of societal expectations

⇒ Financial analysts climate attention have a positive impact on corporate environmental engagement.

Additional Evidence

- Corporate Climate Talk and Its Influence on Analyst Attention
- Corporate Executives' Reactions to Climate-Related Questions

Corporate Climate Talk and Its Influence on Analyst Attention

$$Q_CC_{i,t} = \alpha_0 + \alpha_1 Pre_CC_{i,t} + \alpha_2 Pre_CC_Tone_{i,t} + \alpha_3 Pre_CC_{i,t} \times Pre_CC_Tone_{i,t} + \alpha_4 Controls_{i,t} + \gamma_t + \lambda_s + \epsilon_{i,t}$$

- $Q_CC_{i,t}$ ($Pre_CC_{i,t}$) is an indicator variable that equals one if the question (presentation) session includes at least one climate change bigram for firm i in year t
- Finding: Executive discussions on climate issues boost analysts' attention.

Dependent Variable: climate change in analysts' questions	(1)	(2)	(3)	(4)
Pre_CC	0.140*** (13.195)	0.094*** (7.381)	0.133*** (12.771)	0.132*** (11.849)
Pre_CC * pre_cc_subjectivity		0.142*** (7.190)		
Pre_CC * pre_cc_ratio_pos			0.446** (2.286)	
Pre_CC * pre_cc_ratio_neg				1.323***

Corporate Executives' Reactions to Climate-Related Questions

$$\text{Answers Tone}_{i,t} = \alpha_0 + \alpha_1 Q_CC_{i,t} + \alpha_2 \text{Controls}_{i,t} + \gamma_t + \lambda_s + \epsilon_{i,t},$$

- $\text{Answers Tone}_{i,t}$ includes answer_cc_d , $A_CC_Complexity$, $A_CC_Subjectivity$, $A_CC_Uncertainty$, and $A_CC_Sentiment$
- $Q_CC_{i,t}$ is an indicator variable that equals one if the question session includes at least one climate change bigram.
- Finding: Executives often respond to climate-related questions with increased complexity, subjectivity and uncertainty, typically framed in a positive tone.

Dependent Variable	answer_cc_d	$A_CC_Complexity$	$A_CC_Subjectivity$	$A_CC_Uncertainty$	$A_CC_Sentiment$
Q_CC	0.109***	1.901***	0.061***	0.001***	0.001***

Conclusion

- Summary
 - **Information asymmetry & impression management:** Executive's climate talk has a **negative** impact on analysts' forecasting performance
 - **Market discipline & monitoring role of financial analysts:** Financial analysts climate attention have a **positive** impact on corporate environmental engagement
 - Executive's climate talk has a **positive** impact on analysts climate attention
 - Executives tend to answer climate-related questions in a more complex, subjective, and uncertain manner, often with a positive tone.
- Implications
 - Analysts can act as a form of market discipline and promote corporate accountability.
 - Encourage genuine climate talk to build market trust and support informed decision-making.