The Price of Climate Talk:
Central Bank Communication, Climate Governance, and Sovereign Risk Premia

Bhavya Gupta[1] and Ramkishen S. Rajan[2]

[1] *Corresponding author*
Postdoctoral Research Fellow, Oxford Climate Policy Hub,
Blavatnik School of Government, University of Oxford
bhavya.gupta@bsg.ox.ac.uk

[2] Yong Pung How Professor, Lee Kuan Yew School of Public Policy,
National University of Singapore
rrajan01@nus.edu.sg

Abstract

Central banks now intervene in climate governance through climate-related communication, but we know little about how this affects financial markets. We examine whether such discourse is associated with differences in how long-term sovereign debt prices reflect climate risk. Building on salience theory, we develop a framework in which climate communication increases yields when it makes climate-related risks more salient and decreases yields when it reduces policy uncertainty. Institutional authority and credibility amplify these effects. Using a dataset of over 17,000 speeches from 107 central banks between 2000 and 2021, we construct an index of climate-related talk and estimate two-way fixed effects models for 10-year sovereign yields. We find that sovereign yields are higher when central banks make climate risks more salient, consistent with a climate risk premium. The market response is stronger in countries with more independent central banks, suggesting that institutional authority shapes how investors interpret governance signals. The results imply that central bank communication is not merely symbolic but part of the institutional infrastructure through which climate risk is priced, with implications for states' climate policy capacity and for the distribution of climate transition costs.

Keywords: Climate Governance; Central Banks; Central Bank Communication; Sovereign Bond Markets; Climate Risk; Financial Stability

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Key policy insights:

- Central banks are increasingly referring to climate change in their speeches.
- Communication on climate-related issues by central banks raises long-term sovereign bond yields, reflecting a climate risk premium.
- Institutional credibility plays a role in mediating the market reaction to central banks' climate communication.
- Sovereign bond yields demonstrate a stronger reaction to central banks' climate talk in countries where central banks are more independent from governments.
- Therefore, central bank discourse is not merely neutral information provision but emerges as an active form of climate governance with material economic consequences.

1. Central Bank Communication and Climate Change

Central bank communication has changed since the deliberate opacity of the 1980s and 1990s. As inflation targeting and central bank independence took hold, and in the wake of the global financial crisis, many central banks moved towards more explicit guidance to financial markets and the public (Blinder et al. 2008; Woodford 2005). Forward guidance and greater transparency were intended to clarify policy stances, reduce uncertainty, and improve the transmission of monetary policy.

More recently, central banks have begun to address risks at the edge of their formal mandates, most visibly climate change. Since the Paris Agreement and Mark Carney's 2015 "tragedy of the horizon" speech, climate change has been increasingly framed as a threat to macro-financial stability. Central banks now routinely highlight both transition and physical climate risks, as well as the need for the financial system to support decarbonisation. The shift toward climate-focused communication marks a sharp break from the pre-Paris era.

Central bank climate communication functions as a governance instrument. By leveraging institutional authority and credibility, central banks influence how investors interpret climate-related uncertainty and price risk in sovereign bond markets (Cheng et al. 2023). Central bank communication is one channel through which information about climate risks and environmental policy reaches financial markets. It also conveys signals about a country's transition path and likely regulatory framework (author).

Such information is priced into a range of assets, including fixed-income securities (Born et al. 2014). Central bank climate discourse operates through two competing channels: it can reduce policy uncertainty by signalling awareness of risks and prospective

transitions or amplify perceived risks by highlighting threats to economic and financial stability.

We build on climate governance work that treats financial institutions as actors shaping how climate risk is managed and anticipated (Bernstein & Cashore 2012; Hale & Held 2012). Central banks, through communication and credibility, play a governing role by influencing how climate uncertainty becomes priced. Our focus on central bank climate communication complements existing work on the Network of Central Banks and Supervisors for Greening the Financial System (NGFS), the Task Force on Climate-related Financial Disclosures (TCFD), and financial regulation (Campiglio et al. 2025; van der Ven et al. 2017). Such work positions central banks as actors in climate governance rather than neutral observers. Where central banks possess institutional authority and legitimacy, their climate discourse operates as a governance signal about future climate policy and the associated financial risks.

While recent work studies the content and drivers of central bank climate communication (Arseneau & Osada 2023; Arseneau et al. 2022; Feldkircher & Teliha 2024), we focus on the market response, as reflected in long-term bond yields. For sovereign debt markets, what central banks say about climate is itself a governance instrument: if climate talk is associated with changes in yields, communication becomes part of the infrastructure through which climate risk feeds into sovereign borrowing costs.

We develop a theoretical model, adapted from salience theory, to understand how climate talk affects bond pricing through two competing mechanisms. Our empirical analysis draws on a new text-based measure of central bank climate talk, using natural language processing (NLP) to quantify mentions of climate-related terms in speeches delivered by central bankers across 107 countries over two decades (2000-2021). We

employ two-way fixed effects models to examine how climate discourse is associated with 10-year sovereign bond yields while controlling for conventional macroeconomic, financial, and institutional determinants.

First, we develop a behavioural model that links environmental policy communication to sovereign bond pricing through attention-based mechanisms, positioning central bank discourse as a form of climate governance rather than mere information provision. No formal framework currently exists that connects central bank climate talk to sovereign yields through this governance lens. Second, we show empirically that central bank communication about climate risks is associated with a sovereign risk premium, even after controlling for conventional macro-fiscal fundamentals and observable physical climate shocks. Communication acts as a governance channel through which climate risks feed into sovereign borrowing costs, with implications for state climate capacity and the distributional burden of financing climate transitions.

The rest of the article proceeds as follows. Section 2 presents the theoretical framework; Sections 3 and 4 present the empirical model and data. Section 5 lays out the empirical findings; and the final section concludes.

2. Theoretical Framework

2.1 Evolution of Central Bank Communication on Climate Risks

Debates about central banks' role in climate policymaking have shifted markedly. Where initial scepticism prevailed regarding the appropriateness of central bank engagement in climate matters, more recent work acknowledges central banks as climate governance actors while questioning the scope and effectiveness of their interventions (Dafermos & Nikolaidi 2021; Schnabel 2021). The shift reflects recognition that climate

change poses systemic risks to financial stability and macroeconomic performance, bringing it within central banks' traditional mandates (Carney 2015; Villeroy de Galhau 2021).

Central bank communication on climate has grown from isolated mentions to systematic integration into governance frameworks. The Network of Central Banks and Supervisors for Greening the Financial System (NGFS), established in 2017, exemplifies this institutionalization, bringing together over 130 central banks and supervisors committed to incorporating climate-related risks into financial stability monitoring and supervision. Through speeches and published reports, central banks exercise governance authority by signalling their recognition of climate risks and articulating their approaches to managing them within existing mandates.[1]

2.2 A Simple Model

a) Model Setup

To formalize the foregoing competing mechanisms, we adapt the salience theory of Bordalo et al. (2012) to the context of sovereign debt markets. Salience theory provides a behaviorally grounded framework for understanding how the presentation of information can influence decision-making under risk, even when the underlying risk distributions remain unchanged (Bordalo et al. 2013).

[1] The extent to which central banks engage in climate change mitigation is shaped by a range of political economy factors, including a country's institutional framework (Deyris 2023; DiLeo et al. 2023), the central bank's legal mandate (Dikau & Volz 2021; Tamez et al. 2024), the degree of national exposure to climate risks (Gupta et al. 2023), and the beliefs and preferences of key decision-makers within these institutions (Siderius 2023). Central banks' participation in global regulatory networks such as the NGFS also play a key role in enabling the diffusion and emulation of policies across central banks (Wasserfallen 2019).

Time is discrete, $t \in \{0,1\}$. The government issues a bond with a yield r. Investors are inattentive and initially underweight climate risks. The central bank chooses a communication intensity $\theta \geq 0$, which both increases the salience of climate exposures and can reduce uncertainty by clarifying policy. Central bank communication enters the model as a governance signal that directs market attention to climate risk. The parameter θ captures both the provision of information and the exercise of institutional authority in making climate risks economically salient.

Without climate communication (θ = 0), investors price bonds according to conventional fundamentals:

$$\boldsymbol{r_0 = \rho + \delta D + \varepsilon X} \qquad (1)$$

where: ρ is the risk-free rate, D the debt-to-GDP ratio, X a vector of fiscal vulnerabilities (defined so that higher values imply weaker fundamentals, e.g., higher deficit, higher short-term debt), and $\delta, \varepsilon > 0$.

Transition and physical climate exposures exist in both regimes, but when $\theta = 0$, investors effectively underweight them. When central banks communicate about climate ($\theta > 0$), they shift attention toward these exposures and potentially reduce uncertainty through policy information. We capture this as an additive "climate communication premium" to the baseline yield, so that the yield becomes:

$$\boldsymbol{r_1 = \rho + \delta D + \varepsilon X + a(c)[\phi(\theta)T + \phi_p(\theta)P - \psi(\theta)I]} \qquad (2)$$

where: T is exposure to transition risk (e.g., carbon pricing, regulatory changes, stranded assets); P is exposure to physical risk (e.g., disaster losses, adaptation outlays); I is the informational content conveyed by the communication capturing policy clarity and

forward guidance precision; $c \in [0,1]$ indexes central bank independence/credibility;[2] and $a(c)$ represents an increasing function that scales the market's responsiveness to communication based on institutional credibility.

We make the following assumptions:

- Salience Mechanism: $\boldsymbol{\phi'(\theta) > 0 \; and \; \phi'_p(\theta) >}$. Increased climate communication intensity raises the subjective weight that investors assign to both transition and physical risk exposures (T and P).
- Information Mechanism: $\boldsymbol{\psi'(\theta) > 0}$. Communication can reduce perceived uncertainty when it conveys meaningful information about policy directions and regulatory frameworks.
- Credibility Amplification: $\boldsymbol{a'(c) > 0}$. The credibility parameter c captures the degree to which markets perceive central bank communication as analytically grounded rather than politically motivated. Central banks with greater legal independence and operational autonomy typically command higher credibility in their communications, as markets recognize that such institutions face fewer political constraints in their risk assessments. Moreover, central banks with established reputations for technical competence in monetary policy may find that this credibility extends to their communications on emerging risks. In contrast, less independent institutions may find their climate discourse receives a more sceptical market reception, as investors question whether such communications reflect genuine risk analysis or political positioning.

[2] This draws on the extensive literature documenting heterogeneous communication effectiveness across institutions (e.g., Ehrmann and Fratzscher (2007).

b) Key Predictions

Taking the derivative of r_1 (equation 2) with respect to communication intensity:

$$\frac{\delta r_1}{\delta \theta} = a(c)[\phi'(\theta)T + \phi_p'(\theta)P - \psi'(\theta)I] \quad (3)$$

Since $a(c) > 0$, this yields our central prediction:

$$\frac{\delta r_1}{\delta \theta} > 0 \text{ if } \phi'(\theta)T + \phi_p'(\theta)P > \psi'(\theta)I$$

Intuitively, if communication mainly causes investors to reweight transition and physical exposures (salience mechanism dominates), yields will rise. However, if central bank communication on environmental risks primarily clarifies policy and reduces uncertainty (information mechanism dominates), yields will fall.

We also obtain a prediction about credibility effects:

$$\frac{\delta}{\delta c}\left(\frac{\delta r_1}{\delta \theta}\right) = a'(c)[\phi'(\theta)T + \phi_p'(\theta)P - \psi'(\theta)I] \quad (4)$$

The absolute sensitivity of yields to climate talk, $\left|\frac{\delta r_1}{\delta \theta}\right|$, increases with c whenever $\phi'(\theta)T + \phi_p'(\theta)P - \psi'(\theta)I \neq 0$. The model implies that credibility magnifies whichever mechanism dominates: if salience effects dominate, credible talk raises yields more; however, if information effects dominate, credible talk lowers yields more.

c) Testable Hypotheses

This framework yields two testable hypotheses:

H1. Central bank climate communication is associated with higher sovereign bond yields when the salience mechanism dominates the information mechanism.

H2. Climate communication is more strongly associated with sovereign bond yields where central banks have higher institutional authority and independence.

3. Empirical Model

Our empirical analysis examines the association between central bank climate discourse and sovereign bond yields using a two-way fixed effects model, controlling for all time-invariant unobservables varying across countries through country fixed effects (such as a country's geographical size and cultural factors), as well as factors varying over time but affecting all countries equally through year fixed effects (such as the 2007-08 global financial crisis or the COP-21 Paris Agreement signed in 2015). We also include a comprehensive set of traditional macroeconomic, financial, and institutional variables identified by the prior literature as key determinants of bond yields. The benchmark estimation equation is as follows:

$$yield_{i,t} = \alpha_i + \mu_t + \beta_1 CBClimateTalk_{i,t} + \gamma \boldsymbol{X_{i,t}} + \varepsilon_{i,t} \quad (5)$$

where $yield_{i,t}$ is the 10-year sovereign bond yield in country i at time t; α_i denotes time-invariant country fixed effects; μ_t denotes country-invariant year fixed effects; $CBClimateTalk_{i,t}$ is our central bank climate communication index (Greenindex1 or Greenindex2); $\boldsymbol{X_{i,t}}$ is the vector of economic, financial, and institutional determinants of government bond yields in country *i* at time *t.* These include macroeconomic indicators

(real GDP and inflation), fiscal variables (central government debt as a share of GDP, primary balance as share of GDP, and share of foreign debt in total government debt), financial development indicator (private sector credit extended by banks as share of GDP), measures of external sector vulnerability (real exchange rate volatility), and an institutional quality indicator (regulatory quality). β_1 and γ denote parameters to be estimated; and $\varepsilon_{i,t}$ is the idiosyncratic error term.

First, we analyze the direction of the association between central bank climate discourse and sovereign bond yields across our full sample of countries**.** If Hypothesis 1 holds, then the estimated coefficient β_1 on our climate talk index should be positive. To test Hypothesis 2, we employ the comprehensive central bank independence index developed by Romelli (2022), which provides time-varying measures across our sample countries. This central bank independence index corresponds to the credibility parameter c in our model, capturing both legal independence and de facto operational autonomy. We dynamically divide the sample by median level of central bank independence to explore how climate talk influences bond yields differently across the two sub-samples. If Hypothesis 2 holds, then the estimated coefficient on the climate communication variable should be larger in the sub-sample with higher central bank independence.

4. Data and Variable Construction

Our dependent variable is the yield on 10-year sovereign bonds, sourced from Global Financial Data[3] for 41 countries from 2000 to 2021[4]. We focus on 10-year maturities

[3] Retrieved from: https://globalfinancialdata.com/

[4] The empirical analysis with a full set of controls includes data from 37 countries, as a further four countries are dropped from our model due to unavailability of data across all variables.

as they represent the benchmark tenor with the greatest liquidity across our sample, and their longer duration makes them particularly sensitive to climate-related transition risks that unfold over extended horizons.

Our key independent variable is a text-based measure of central bank climate talk, generated using text analysis techniques (Bricongne et al. 2024) from over 17,000 speeches delivered by central banks from 2000 to 2021. The speeches are first scraped from the Bank for International Settlements (BIS) website, a centralized, verified repository of central bank communications from around the world. We then clean the texts and attribute each speech to its issuing country and year.

We tokenize the speech text into individual words and create a document-term matrix (DTM) where each row corresponds to a speech and each column corresponds to a specific word. We then focus on a subset of terms related to climate change, environmental issues, and the net-zero transition, which we define as "green words." The frequency of these green words, normalized by the total word count of each speech, forms the green speech index. We generate two versions of this index:

- Greenindex1: Counts the frequency of "climate," "environment," and "green" relative to total words
- Greenindex2: Counts the frequency of "climate" and "green" relative to total words (excluding "environment" to reduce potential noise)

The selection of green words is informed by a text analysis of all central bank speeches, where Natural Language Processing (NLP) techniques identify the most

These countries are Estonia, Iceland, Israel, and Luxembourg. A full list of countries included in the empirical analysis can be found in Appendix A (Table A2).

frequent two-word combinations (bigrams) in the cleaned text. We find that terms like "green bonds," "green finance," "greenhouse gas," and "network greening" appear frequently, as do bigrams like "climate change" and "climate risks." Notably, the word "climate" co-occurs with terms such as "investment" and "business climate," while "environment" is used in a variety of contexts, not all of which are directly linked to climate change.

We complement this quantitative approach with qualitative coding to contextualize central banks' climate discourse. The topic models reveal key themes emphasised by central bankers in their speeches, including physical climate risks, transition risks, green finance, and the role of central banks in enabling financial markets to support the low-carbon transition.

Our empirical specification includes comprehensive controls for established yield determinants: macroeconomic factors (real GDP, inflation rate); fiscal variables (government debt ratio, primary fiscal balance, foreign debt share); financial development (private credit extension by banks); external conditions (real exchange rate volatility); and institutional capacity (regulatory quality index). We also include physical climate risk exposure, proxied using climate disaster impacts data from the international disaster database EM-DAT to separate communication effects from actual physical climate risks. A description of these variables is provided in Appendix A (Table A1) along with summary statistics of all key variables in Table A3.

5. Empirical Findings

We begin by estimating a model of long-term bond yields that incorporates central banks' climate discourse as an additional explanatory variable. We then examine whether

the association of central bank climate communication with sovereign bond yields varies with the degree of central bank independence from the government.

5.1 Baseline Results

Table 1 presents our baseline results. Columns 1 and 2 show that central bank climate discourse is associated with higher 10-year sovereign bond yields. The results are consistent with Hypothesis 1: the salience channel dominates when central banks highlight climate risks, as research shows that communication can amplify rather than dampen perceptions of risk (Mishkin 2007). Specifically, an increase of one standard deviation in the "greenness" of central banks' speeches is associated with an increase of 0.15 standard deviations on average in long-term sovereign bond yields. The estimated effect is roughly 45 basis points, even after controlling for macroeconomic fundamentals and including country- and year-fixed effects.

Among other conventional determinants, inflation is positively associated with higher bond yields, in line with prior expectations (Afonso & Rault 2015). Greater government debt is associated with higher bond yields (Poghosyan 2014). Greater financial development, proxied by bank private credit, is associated with higher long-term bond yields, consistent with more developed financial sectors amplifying real economy shocks during episodes of global uncertainty (Csonto & Ivaschenko 2013). Higher regulatory quality is associated with lower bond yields by reducing the political risk premium (Eichler 2014).

Table 1: Baseline results – Association between climate talk and long-term bond yields (standardised variables)

VARIABLES	(1)	(2)
Greenindex1	0.113**	
	(0.0541)	
Greenindex2		0.187**
		(0.0829)
Real GDP (log)	0.608	0.651
	(0.955)	(0.946)
Inflation	0.331***	0.335***
	(0.0701)	(0.0699)
Gross debt (% GDP)	0.474***	0.463***
	(0.153)	(0.149)
Primary balance (% GDP)	-0.0489	-0.0529
	(0.0712)	(0.0690)
Foreign debt share (% total)	-0.0497	-0.0402
	(0.0792)	(0.0785)
Private credit extended by banks	0.556***	0.549***
(% GDP)	(0.183)	(0.183)
REER Volatility	-0.00223	-0.00279
	(0.0237)	(0.0233)
Regulatory quality	-0.667***	-0.688***
	(0.216)	(0.220)
Constant	-0.293	-0.285
	(0.710)	(0.699)
Observations	503	503
Countries	37	37
R-squared	0.844	0.845
Fixed Effects	YES	YES

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

5.2 Robustness: Physical Climate Risk Controls

Although our results reveal a positive and statistically significant association between central banks' climate talk and long-run bond yields, the robustness of our findings could be compromised by confounding factors. A primary concern is the potential for omitted-variable bias, in which an unaccounted-for factor could be driving both the increase in climate talk and the rise in bond yields. For example, an increase in

the frequency of climate-related disasters and extreme weather events could raise sovereign bond yields and prompt central banks to focus more attention on the emerging risks of climate change. To mitigate this potential bias, we replicate our baseline empirical model by incorporating a proxy for climate-related physical risks, measured through the number of individuals affected by climate disasters (per million population), using data from the Emergency Events Database (EM-DAT).[5]

Table 2 shows that the positive, statistically significant relationship between central bank climate discourse and higher sovereign bond yields persists even after accounting for the increased incidence of climate-related physical risks. These results suggest that our climate talk variable is not merely capturing heightened physical climate risks. Specifically, a one-standard-deviation increase in central bank climate talk is associated with a 0.16-standard-deviation increase in long-term sovereign bond yields on average, corresponding to approximately 0.46 percentage points.

Table 2: Including physical climate risk proxy in baseline regression (standardised variables)

	(1)	(2)
VARIABLES	Baseline	Baseline
Greenindex1	0.120**	
	(0.0519)	
Greenindex2		0.192**
		(0.0824)
EM-DAT (Persons affected by climate disasters, per million)	0.0166***	0.0148***
	(0.00516)	(0.00435)
Real GDP (log)	0.573	0.614
	(0.948)	(0.939)
Inflation	0.334***	0.338***
	(0.0699)	(0.0697)
Gross debt (% GDP)	0.472***	0.461***
	(0.152)	(0.149)
Primary balance (% GDP)	-0.0494	-0.0533
	(0.0710)	(0.0689)
Foreign debt share (% total)	-0.0490	-0.0392

[5] Available here: https://www.emdat.be/

	(0.0791)	(0.0785)
Private credit extended by banks	0.555***	0.547***
(% GDP)	(0.183)	(0.182)
REER Volatility	-0.00439	-0.00487
	(0.0238)	(0.0234)
Regulatory quality	-0.666***	-0.687***
	(0.216)	(0.220)
Constant	-0.264	-0.253
	(0.703)	(0.691)
Observations	503	503
Countries	37	37
R-squared	0.845	0.845
Fixed Effects	YES	YES

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

5.3 Central Bank Independence Effects

As central banks are regarded as key custodians of a country's macro-financial stability, their credibility in guiding the economy towards high growth, low inflation, and financial stability is typically underpinned by their insulation from political influence (Qanas & Sawyer 2024). We examine whether central bank credibility, as measured by its independence from the government, moderates the association of central banks' climate discourse with long-term bond yields (Hypothesis 2). To explore this, we dynamically divide our sample of countries into two groups based on the median level of central bank independence (CBI), resulting in sub-samples of countries with low and high CBI. We then estimate the baseline model for each sub-sample.

The results, presented in Table 3, show that central bank independence moderates the association of climate discourse with long-term bond yields. Specifically, in countries with high central bank independence (columns 3 and 4), increased climate talk is associated with higher sovereign bond yields. However, this relationship does not hold in countries with CBI levels below the median. The stronger response in more independent

central banks suggests that credibility—perceived to be higher in these institutions—plays a key role in how market participants price climate risks into financial assets. The results are consistent with Hypothesis 2, which posits that credibility amplifies these associations. Markets apparently discount climate discourse from less independent central banks, viewing it as potentially politically motivated rather than reflecting a genuine risk assessment.

Table 3: Dividing sample into low vs high levels of CB independence (standardised variables)

VARIABLES	(1)	(2)	(3)	(4)
	CBI = Low		CBI = High	
Greenindex1	0.0913		0.184***	
	(0.0773)		(0.0601)	
Greenindex2		-0.0500		0.262***
		(0.0969)		(0.0836)
Real GDP (log)	0.270	0.128	0.802	0.774
	(1.072)	(1.054)	(1.301)	(1.414)
Inflation	0.287***	0.295***	0.365***	0.374***
	(0.0805)	(0.0818)	(0.117)	(0.122)
Gross debt (% GDP)	0.208	0.204	0.625**	0.617**
	(0.141)	(0.135)	(0.224)	(0.221)
Primary balance (% GDP)	-0.0862	-0.0914	0.0339	0.0280
	(0.0746)	(0.0758)	(0.106)	(0.101)
Foreign debt share (% total)	-0.0281	-0.0201	-0.0486	-0.0361
	(0.116)	(0.117)	(0.0821)	(0.0803)
Private credit extended by banks (% GDP)	0.302	0.269	0.603**	0.578**
	(0.231)	(0.255)	(0.229)	(0.223)
REER Volatility	0.000670	-0.00468	-0.0359	-0.0397
	(0.0289)	(0.0273)	(0.0309)	(0.0313)
Regulatory quality	-0.605*	-0.579	-0.361	-0.397
	(0.333)	(0.345)	(0.360)	(0.366)
Constant	0.293	0.450	-0.863	-0.781
	(1.028)	(1.019)	(0.754)	(0.792)
Observations	230	230	271	271
Countries	19	19	19	19
R-squared	0.903	0.902	0.803	0.804
Fixed Effects	YES	YES	YES	YES

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

5.4 Summary and Implications

The empirical findings suggest that the salience channel dominates the information channel. When central banks discuss climate risks, markets appear to increase their assessment of relevant risks rather than feeling reassured about policy preparedness and response. Current central bank climate communication strategies may inadvertently be associated with higher government borrowing costs, particularly where central banks enjoy high credibility.

The finding that these associations are stronger among independent central banks raises important questions about optimal institutional design. While independence traditionally insulates monetary policy from political pressures, our results suggest it also affects how markets interpret non-traditional communications on topics such as climate change.

Our results contribute to understanding market efficiency in processing climate information. If independent central banks provide credible climate risk signals that markets incorporate appropriately, this suggests reasonably efficient information processing. The absence of effects from less credible institutions might indicate appropriate discounting of low-quality signals, or it could reflect under-reaction to legitimate climate concerns.

6. Conclusions and Policy Implications

We examined how central bank climate communication is related to the pricing of climate risk in sovereign debt markets. Our findings reveal that markets price sovereign debt differently when central banks make climate risks salient, with this pricing channel particularly pronounced in countries with higher central bank institutional authority.

These results position central bank discourse not as neutral information provision but as an active form of climate governance with material economic consequences.

First, central banks are not neutral observers of climate risk—they are active actors in climate governance. Through communication, central banks exercise institutional authority that structures how climate uncertainty becomes economically meaningful. That role extends beyond formal policy instruments to include the discursive construction of climate risk as a market-relevant phenomenon. Central banks thus help shape the risks they claim to manage.

Second, institutional authority and credibility function as power resources in climate governance. Our finding that climate communication has stronger market associations in countries with independent central banks suggests that capacity depends not only on formal mandates but on perceived legitimacy. Where central banks lack institutional authority, their climate discourse may be discounted or ignored by markets, limiting their effectiveness. The stronger response in more independent central banks suggests that credibility—perceived to be higher in these institutions—plays a key role in how market participants price climate risks into financial assets.

Third, climate communication has distributional consequences that matter for climate justice and state capacity. If central bank climate discourse is associated with higher sovereign borrowing costs, this creates a potential tension: countries that speak more about climate risk may face higher financing costs for climate transitions. Such a distributional effect raises normative questions about who bears the burden of climate governance. Countries with lower institutional credibility may face a double penalty—less governance authority and potentially higher costs when attempting to signal climate

awareness. These dynamics have implications for how we understand the political economy of climate transitions and the role of financial markets in climate governance.

Our paper supports viewing central bank climate communication as part of the institutional architecture through which climate risk is translated into financial outcomes. Communication is not merely symbolic—it is an infrastructure that enables the economic valuation and institutionalization of climate uncertainty. By making climate risks salient, central banks help transform abstract environmental change into concrete financial metrics.

Such governance infrastructure operates through credibility and institutional authority rather than formal regulation. Markets respond to climate communication from independent central banks because they interpret these signals as informative about underlying risks and future policy trajectories. In this sense, governance works through the anticipatory logic of financial markets rather than through direct policy intervention. The findings also underscore concerns about the democratic accountability and transparency of such governance mechanisms.

Two avenues for further work are particularly important. First, research should examine asset-class heterogeneity in the transmission of governance signals: do similar communication patterns have different market associations in corporate credit spreads, equities, or exchange rates? Understanding variation across asset classes would illuminate how governance signals are interpreted and priced differently depending on market structure and investor composition.

Second, future work should distinguish between different types of climate communication content using richer text analysis. Topic models and sentiment measures could help separate “risk-identification” discourse from “policy-solution” discourse, and

test whether markets respond differently to alarmist versus reassuring climate talk. The distinction matters for climate governance: if markets primarily respond to risk framing rather than policy clarity, it suggests limits to communication as a governance tool for managing transitions.

Climate governance increasingly operates through financial markets and institutions, with central banks emerging as key actors in this arena. Our results suggest that this governance role has material consequences: how central banks talk about climate risk shapes how markets price sovereign debt, with implications for state capacity to finance climate transitions. Understanding these dynamics is crucial for designing effective and equitable climate arrangements that account for the power of institutional authority and the distributional consequences of market-based mechanisms.

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Appendix A

Table A1: Description of Control Variables

Variable	Data Source
Climate physical risks	EM-DAT (persons affected by climate disasters)
GDP growth	Real GDP (log, constant 2015 US$), World Bank
Inflation	Inflation (consumer prices, annual %), World Bank
Fiscal indicator: Gross government debt	Gross government debt (% of GDP), World Bank
Fiscal indicator: Primary balance	Primary balance (% of GDP), World Bank
External sector vulnerability: Foreign debt share	General government debt held by non-residents, % of total, World Bank
Financial development: Private sector credit extended by banks	Private sector credit extended by banks as a share of GDP, World Bank
Institutional strength: Regulatory quality	Regulatory quality, International Country Risk Guide (ICRG)
External sector vulnerability: REER Volatility	Volatility in Real Effective Exchange Rates (REER), World Bank
External sector vulnerability: Forex reserves	Foreign exchange reserves, World Bank

Table A2: Countries included in empirical analysis

Australia	Finland	Lithuania	Slovenia
Austria	France	Mexico	South Africa
Belgium	Germany	Netherlands	Spain
Brazil	Greece	New Zealand	Sweden
Canada	Hungary	Norway	Switzerland
Chile	India	Portugal	United Kingdom
China	Ireland	Poland	United States
Colombia	Italy	Republic of Korea	
Czech Republic	Japan	Russia	
Denmark	Latvia	Slovakia	

Table A3: Summary Statistics

	Count	Mean	Min	Max	SD
Greenindex1	2442	.0099636	0	.7951	.0313994
Greenindex2	2442	.0041336	0	.7434654	.024987
Long-term (10-year) government bond yield	837	4.054743	-.62	24.7	2.970092
EM-DAT (Persons affected by climate disasters, per million population)	2442	1.494678	0	346.5617	14.63284
Real GDP (log terms)	2379	25.12697	19.99031	31.57888	2.319929
Inflation, consumer prices (annual %)	2291	4.304654	-4.478103	96.09411	5.811435
General government gross debt, % of GDP [Government debt sustainability]	2250	54.32409	.052	260.964	35.8669
Primary balance, % of GDP [Government debt sustainability]	2228	-.3083731	-29.927	28.569	4.711842
General government debt held by non-residents, % of total	1022	38.2944	2.267759	89.13692	18.83124
Private sector credit extended by banks (% of GDP)	1832	57.37666	.9155453	260.7013	41.94502
Regulatory quality index (-2.5 weak; 2.5 strong)	2091	.4584653	-2.625506	2.260543	.8585199
Real exchange rate volatility	2163	.0046687	-.910359	.5547152	.0625822
Total reserves (includes gold, current US$)	2288	8.86e+10	1.81e+07	3.90e+12	2.98e+11