

Who Labels and What's Priced? Evidence from Third-Party ESG Assessments in the Municipal Bond Market

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14th Annual Municipal Finance Conference
July 23, 2025

Introduction

Motivation

- ▶ **Recent innovation** in financial markets: borrowers will “label” their fixed income securities to alert investors to ESG impacts and risks
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- ▶ **This paper:** Use the *unexpected* and *quasi-exogenous* rollout of ESG scores and labeling eligibility opinions for over \$1 trillion in municipal bonds on Bloomberg to test:
 1. Are investors willing to pay a premium for the assessment or underlying ESG features of bonds, as determined by a 3rd party verifier?
 2. If such a premium exists, what frictions or incentives lead issuers to under-label bonds that meet labeling criteria?

ESG Investments in Municipal Bonds

Primary tool for financing durable public investment in climate adaptation and social infrastructure in the U.S.

- ▶ **Green & sustainability bonds:** Clean energy, energy-efficient buildings, water/climate adaptation, etc.
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ESG Investments in Municipal Bonds

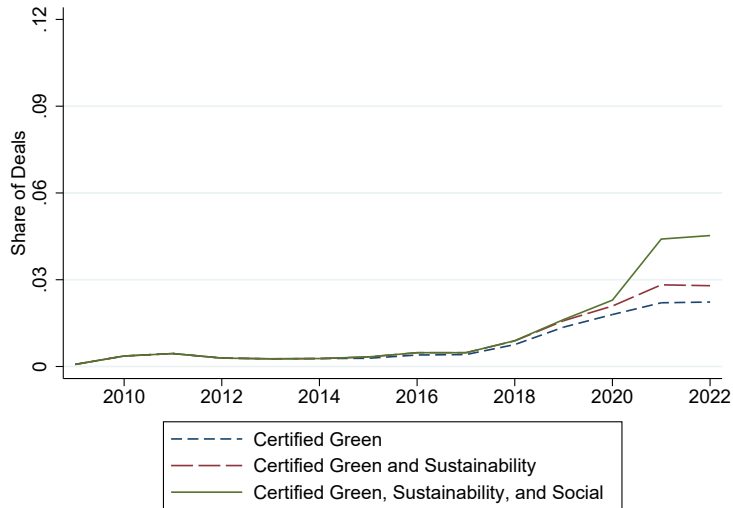
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Most eligible bonds are not labeled.

- ▶ Labeling requires issuer to self-select, self-verify or hire a verifier.
- ▶ Benefit of doing so is unclear, as evidence of impact on pricing/greenium is mixed:
 - ▶ Twin-bond *offering yield* studies find precise zeros (e.g., Larcker and Watts, 2020; Li, Wang, and Yu, 2023); pricing effect emerges in secondary market (Baker, Bergstresser, Serafeim, and Wurgler, 2022).
 - ▶ Matching on observables finds a greenium (Zerbib, 2019); IV suggests null (Tomunen and Yi, 2023).
- ▶ Political pushback against ESG/ESG labeling in certain states during sample (Garrett and Ivanov, 2024).

Labeled Municipal Bond Deals



Data and Sample Selection

Kestrel Data Offering Screen on Bloomberg

W 1: Kestrel ESG Scores (Copy)													
Options Export Settings													
File News Analytics Edit Format Formulas													
View Library Send Share Refresh Export Exchange Permissions Open in Launchpad													
Create Copy Link Rename Favorite View Older Versions													
#	Ticker	BBG: State	BBG: Long Comp Name	BBG: Purpose	BBG: Composite	BBG: Deal Size	BBG: Sale Date	Kestrel Pub Dt	Kestrel Tot ESG	Kestrel Use Of Pro	Kestrel Use Of Pri	Kestrel Use Of F	Kestrel UN SDGs
Kestrel ESG Universe													
	914383AX	KY	University of Kentucky	UNIV. & COLLEGE IMPS.	AA-	104.75MM	08/26/2024		2.85	2.00	3.00	5.00	N.S.
	44420RBH	NY	Hudson Yards Infrastructure Corp	CURRENT REFUNDING	AA-	2.11MM	05/22/2017		4.80	5.00	5.00	4.00	N.S.
	875124HX	FL	Tampa Bay Water	WATER UTILITY IMPS.	AA+	545.89MM	09/09/2024		4.60	5.00	4.00	5.00	N.S.
	709225BD	PA	Pennsylvania Turnpike Commission	HIGHWAY IMPS.	A	465.73MM	01/11/2021		4.80	5.00	5.00	4.00	N.S.
	574300MP	MD	Maryland State Transportation Authority	BRIDGES	AA-	400.00MM	06/15/2020		3.35	3.50	2.50	4.00	N.S.
	64972JML	NY	New York City Transitional Finance Authority	PUBLIC IMPS.	AA+	1.50MM	09/09/2024		3.20	3.00	3.00	4.00	N.S.
	13063ASG	CA	State of California	SCHOOL IMPS.	AA-	6.35MM	04/20/2009		3.20	3.00	3.00	4.00	N.S.
	89602RLU	NY	Triborough Bridge & Tunnel Authority	BRIDGES	AA-	699.26MM	08/12/2024		3.33	3.00	3.50	4.00	N.S.
	43233KAV	FL	Hillborough County Industrial Development Authority	HLTH. HOSP. MURSHOME	AA	1.31MM	08/19/2024		3.90	2.50	4.50	4.00	N.S.
	7091756V	PA	Pennsylvania Higher Educational Facilities Authority	HLTH. HOSP. MURSHOME	AA-	534.87MM	11/11/2019		4.43	3.50	5.00	4.00	N.S.
	69651ADN	FL	Palm Beach County Health Facilities Authority	HLTH. HOSP. MURSHOME	A+	365.78MM	09/23/2019		3.95	3.50	4.50	3.00	N.S.
	249182LN	CO	City & County of Denver CO Airport System Revenue	PRT. AIRPRT & MARINA	A+	2.53MM	08/13/2018		3.34	3.25	3.00	4.00	N.S.
	646140FX	NJ	New Jersey Turnpike Authority	HIGHWAY IMPS.	A+	500.00MM	03/18/2024		3.20	3.00	3.00	4.00	N.S.
	73358JUM	NY	Port Authority of New York & New Jersey	REFUNDING NOTES	AA+	379.93MM	06/19/2023		3.20	3.00	3.00	4.00	N.S.
	25476FF3	DC	District of Columbia	PUBLIC IMPS.	AA+	1.59MM	09/09/2024		3.20	3.00	3.00	4.00	N.S.
	114894YT	FL	County of Broward FL Airport System Revenue	PRT. AIRPRT & MARINA	A+	1.22MM	10/28/2019		3.19	2.50	3.25	5.00	N.S.
	79625GLU	TX	City of San Antonio TX Electric & Gas Systems Revenue	REFUNDING NOTES	AA-	756.71MM	08/26/2024		4.13	4.00	4.50	4.00	N.S.
	292723BN	AL	Energy Southeast A Cooperative District	NAT. GAS UTILITY IMPS.	AA	941.64MM	04/15/2024		2.80	2.50	2.50	4.00	N.S.
	190813SZ	GA	Cobb County Kennestone Hospital Authority	HLTH. HOSP. MURSHOME	A	262.98MM	01/31/2022		4.25	2.00	5.00	5.00	N.S.
	67868JHT	OK	Oklahoma County Finance Authority	SCHOOL IMPS.		112.17MM	01/09/2023		4.18	2.50	5.00	4.00	N.S.
	885528JF	TX	Thrall Independent School District/TX	SCHOOL IMPS.		29.98MM	06/29/2022		4.05	2.00	5.00	4.00	N.S.
	650116HQ	NY	New York Transportation Development Corp	REPAYMENT OF BANK LO	BBB-	2.55MM	06/17/2024		4.30	5.00	3.00	4.00	N.S.
	79739QNV	CA	San Diego County Regional Airport Authority	PRT. AIRPRT & MARINA	A	1.94MM	11/15/2021		3.89	4.25	3.00	4.00	N.S.
	709221VZ	PA	Pennsylvania Turnpike Commission Oil Franchise Tax Revenue	HIGHWAY IMPS.	AA-	529.00MM	08/23/2021		2.68	2.50	2.00	4.00	N.S.
	65820BAZ	NC	North Carolina Housing Finance Agency	STATE SF HSG	AA+	420.00MM	09/09/2024		4.10	2.50	4.50	5.00	N.S.
	196331AE	CO	Colorado Bridge & Tunnel Enterprise	BRIDGES	AA-	150.00MM	04/01/2024		2.93	2.50	3.00	4.00	N.S.
	13068WVH	CA	California State Public Works Board	CURRENT REFUNDING	A+	695.48MM	03/22/2021		3.60	5.00	2.00	4.00	N.S.
	888240FP	MA	Town of Tisbury MA	SCHOOL IMPS.		59.25MM	08/01/2022		4.68	4.50	5.00	4.00	N.S.
	575579HJ	MA	Massachusetts Bay Transportation Authority Sales Tax Revenue	REFUNDING BONDS	AA+	777.39MM	02/14/2005		4.60	5.00	5.00	3.00	N.S.
	646140J3	NJ	New Jersey Turnpike Authority	HIGHWAY IMPS.	A+	502.50MM	01/18/2021		3.20	3.00	3.00	4.00	N.S.

Figure. Bloomberg Data Example

Empirical design to characterize selection

Why do so many issuers that choose not to label otherwise eligible bonds?

- ▶ Of **2,763 eligible** green and sustainability bond issues only **499 (18.1%)** label as such
- ▶ Of **4,540 eligible** social bond issues only **283 (6.2%)** label as such

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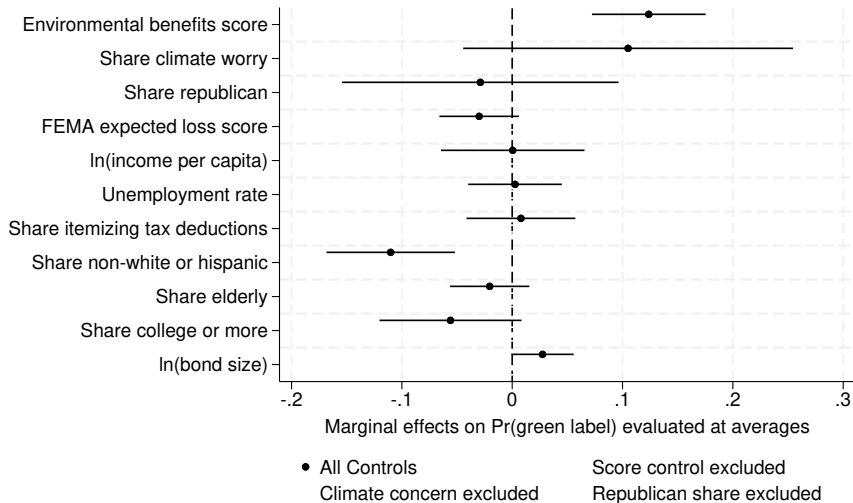
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$$\ln \left(\frac{\pi_i}{1 - \pi_i} \right) = X_i \beta + \varepsilon_i, \quad (1)$$

- ▶ where i denotes the deal
- ▶ π_i is the likelihood that a given issue will be labeled, the outcome variable is the log of odds
- ▶ The coefficients of interest are the β estimates that capture how local and bond characteristics influence the likelihood of labeling a given **eligible bond**
- ▶ X_i includes controls related to potential informational, financial, demographic, and political frictions defined at the local county level (scaled to standard deviations in sample)

Results

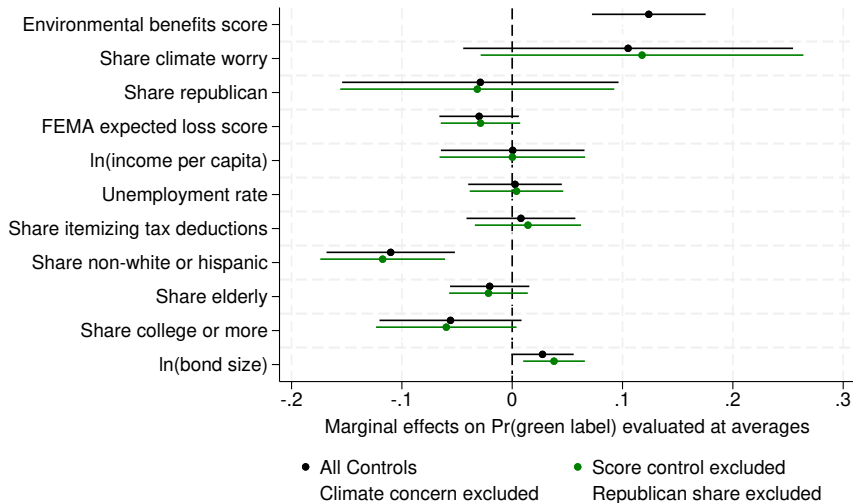
Selection into Green/Sustainability ESG Labeling



Tabulated Logit Estimates

Results

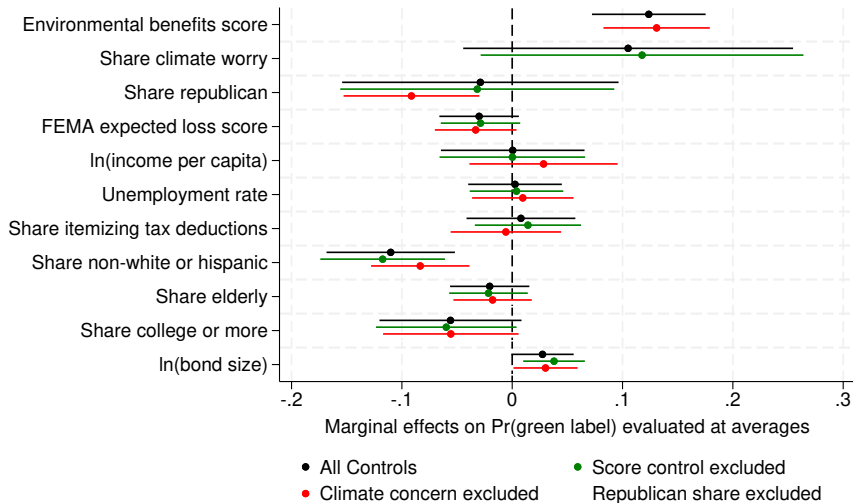
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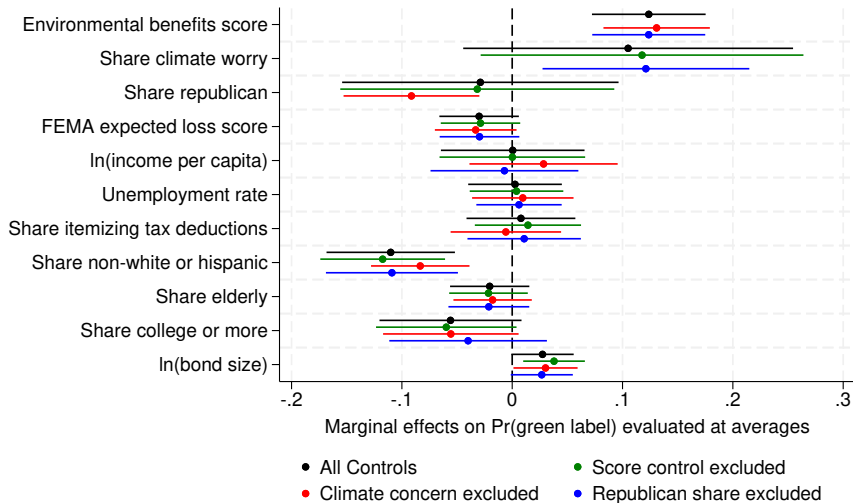
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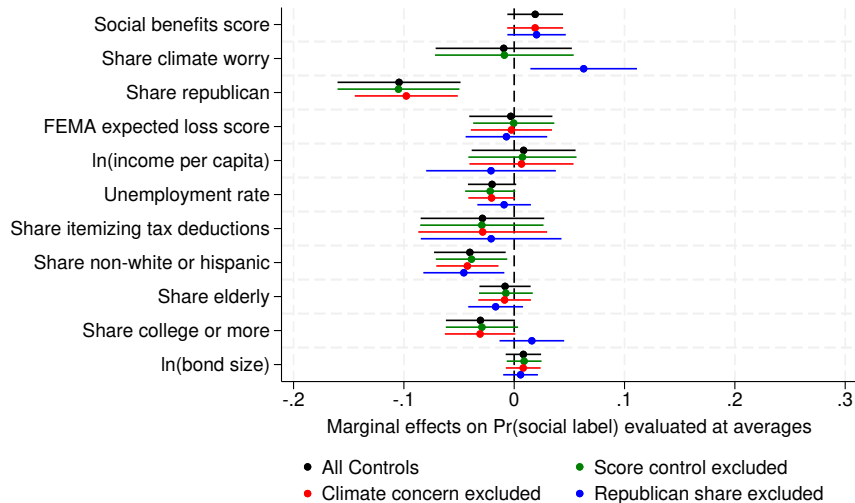
Selection into Green/Sustainability ESG Labeling



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Results

Selection into Social ESG Labeling



Tabulated Logit Estimates

Information Intervention *Willingness to Pay* Identification Strategy

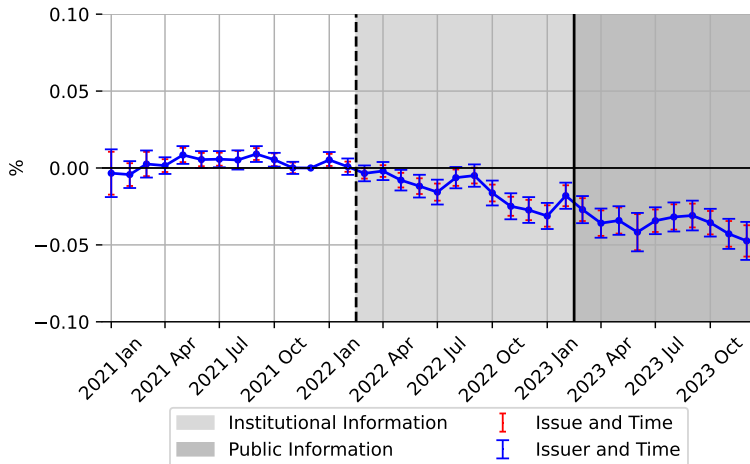
Dynamic Difference-in-Differences

$$Y_{ijt} = \alpha_i + \sum_{k=0}^T (\beta_k + \gamma_{Ek} \text{E Score}_i + \gamma_{Sk} \text{S Score}_i + \gamma_{Tk} \text{T Score}_i) \times \text{assessed}_i \times \mathbb{1}(t = k) + X_{ijt} + \varepsilon_{ijt} \quad (2)$$

- ▶ where i denotes the CUSIP, j denotes the issuer, and t denotes the month between Jan. 2021 and Dec. 2023.
- ▶ Y_{ijt} , the monthly trade-size weighted average tax-adj. spread over a maturity-matched treasury
- ▶ the coefficients of interest are:
 1. monthly β_k estimates, the spread differential for an assessed bond with an average ESG score relative to unassessed bonds—the *assessment effect*
 2. γ_{Ek} , γ_{Sk} , and γ_{Tk} that capture the marginal effect for a 1SD increase in E, S, and T scores, respectively (i.e., *greenium*).
- ▶ α_i is a CUSIP FE and X includes month-by-**maturity**, month-by-**state-by-taxability**, month-by-**credit rating**, month-by-**coupon**, month-by-**issuance size**, month-by-**liquidity** proxy, month-by-**trade size**, month-by-**duration**

Results

Assessment Effect β_k —Spread response for bonds receiving Kestrel ESG assessment

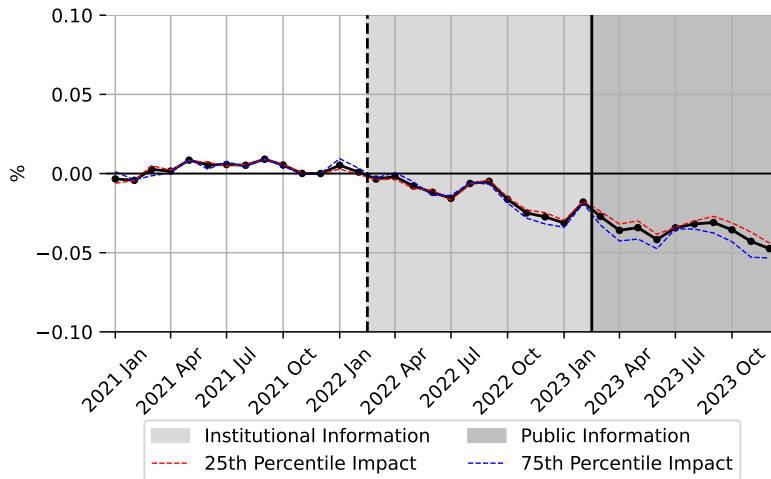


4 bps *assessment effect* for the average bond

Tabulated Results

Results: Environmental Premium

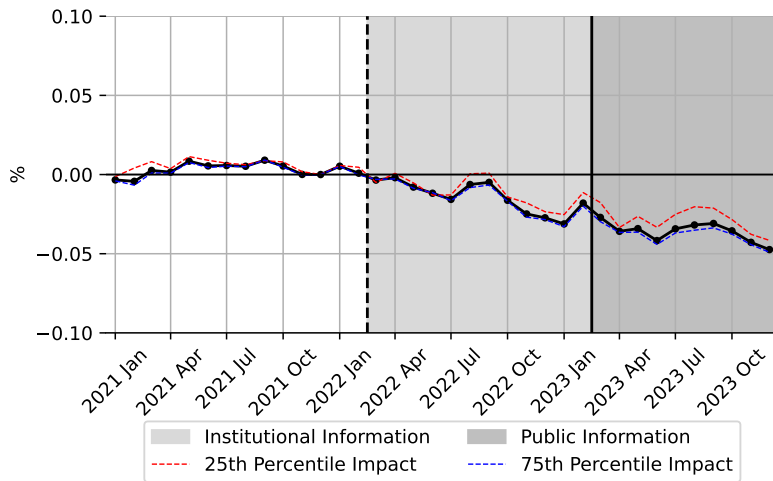
Total effect for inter-quartile range of E score



Move from Environmental Score of 3 to 4 (IQR) $\rightarrow \approx 1$ bps additional spread reduction

Results: Transparency Premium

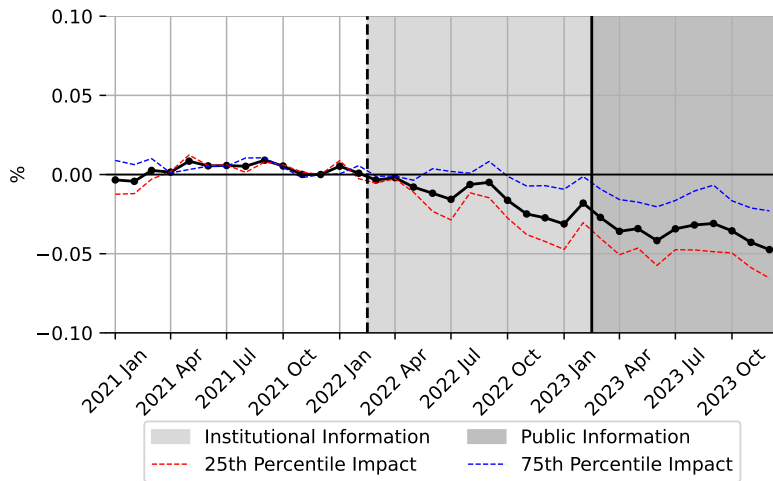
Total effect for inter-quartile range of T score



Move from Transparency Score of 3 to 4 (IQR) $\rightarrow \approx 1$ **bps** additional spread reduction (distaste for poor T)

Results: Social Premium (Discount)

Total effect for inter-quartile range of S score



Move from Social Score of 3 to 5 (IQR) $\rightarrow \approx$ **3.5 bps** lower spread reduction

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Even though the effects are modest, they are **detectable amidst significant pricing noise** in the muni market—indicating investors *do* systematically respond to credible ESG information

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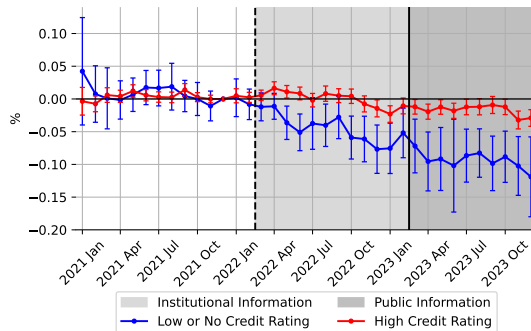
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- ▶ **Institutional Demand:** Are (green) institutional investors driving the pricing effect?
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- ▶ **Bond Characteristics:** Do effects differ by credit quality, funding source, or illiquidity?

Main finding: Pricing impacts are strongest for revenue bonds with **credit risk**.

Limited roles for local beliefs, climate risk, and institutional demand, but these are **economically small**.

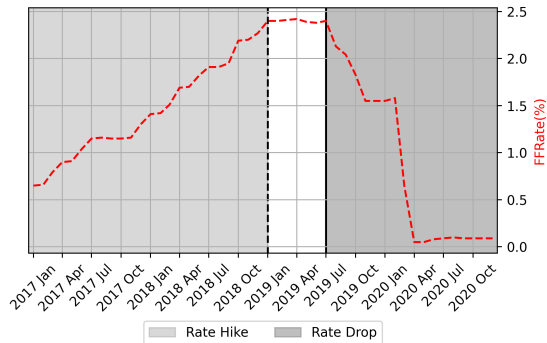
Fig. High vs. Low Risk Revenue Bonds



Placebo Results

Two Placebo Tests to Rule Out Selection-Driven Pricing

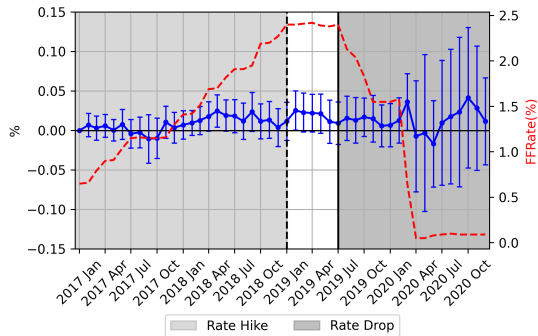
A. Pre-Sample Spreads for Bonds Likely Assessed In-Sample



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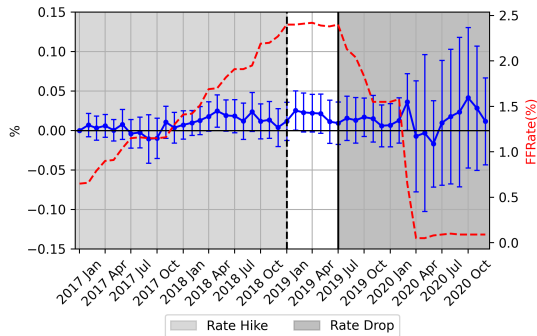
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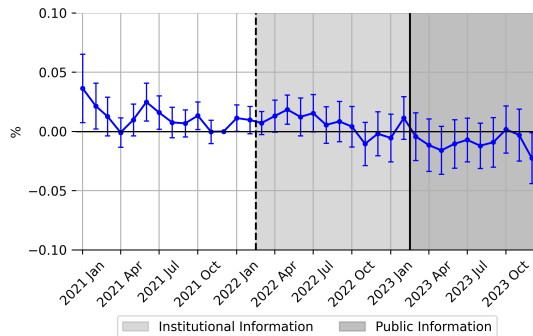
Placebo Results

Two Placebo Tests to Rule Out Selection-Driven Pricing

A. Pre-Sample Spreads for Bonds Likely Assessed In-Sample



B. In-Sample Spreads for Bonds Assessed in Later Period ('24 - '25)



Results **unrelated** to selection of issuers/issuers by Kestrel

Robustness

We conduct a battery of robustness checks including:

- ▶ Including bonds with **call provisions** (spread to first par call) Inc. Callable
- ▶ **Dropping states** that comprise a large portion of the sample and have strong political leanings (i.e., California, New York, Texas) Excl. States
- ▶ Adding a different **liquidity proxy** as a control Adtl. liquidity
- ▶ Including **issuer by time** fixed effects (i.e. identification from issuers who have multiple bonds outstanding and trading that receive different levels of the Kestrel information intervention) Issuer FEs
- ▶ **Pre-tax spreads or raw yields** as outcome variables Alt. Outcome

The results remain quantitatively and statistically consistent in all robustness specifications.

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- ▶ Information friction provides mechanism for previous mixed evidence of **greenium**—lack of accessible ESG data beyond self-labeled green projects made comparisons difficult and distorted investors' willingness to pay
- ▶ **Economic implications:** Our estimates suggest that the creation and distribution this information increased willingness to pay for assessed munis by \$1.16 billion, mostly accruing to ineligible bonds.

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Mechanism 1: Institutional Demand

- ▶ Assessed bonds see **+35% holdings increase** by **green** MFs/ETFs funds in the institutional info period
- ▶ **E-score**: +8%, not significant
- ▶ **S-score**: -32%, significant
- ▶ Non-green and green-tilted funds show **no significant ownership response**
- ▶ Green funds small fraction of notional value of sample—**unlikely to drive entire effect**

\$ Value of Holdings:	All Funds	Green-tilted	Green labeled
	(1)	(2)	(3)
Novel ESG Assessment			
× Institutional Ownership Period	0.00106 (0.0256)	-0.0303 (0.0328)	0.348** (0.173)
× Public Information Period	0.000488 (0.0393)	-0.0930* (0.0492)	-0.0294 (0.307)
× Environmental Score (σ)			
× Institutional Ownership Period	-0.00460 (0.0107)	-0.0331 (0.0213)	0.0888 (0.103)
× Public Information Period	-0.00287 (0.0185)	-0.0183 (0.0323)	0.187 (0.145)
× Social Score (σ)			
× Institutional Ownership Period	0.00256 (0.00980)	0.00626 (0.0233)	-0.326** (0.148)
× Public Information Period	0.00427 (0.0160)	-0.0182 (0.0371)	-0.143 (0.209)
× Transparency Score (σ)			
× Institutional Ownership Period	-0.000369 (0.00633)	-0.0206 (0.0220)	0.185** (0.0849)
× Public Information Period	0.00401 (0.0108)	-0.0128 (0.0308)	0.247* (0.135)
Ex Ante Labeled			
× Institutional Ownership Period	-0.0401 (0.0582)	-0.156 (0.0998)	0.167 (0.135)
× Public Information Period	-0.0609 (0.0991)	-0.430*** (0.162)	0.0166 (0.185)
Observations	533,965	164,277	11,200
CUSIP Fixed Effects	Y	Y	Y
State by tax by Month FE	Y	Y	Y
Credit Rating by Month FE	Y	Y	Y
ln(Size) and Coupon (linear) by Month FE	Y	Y	Y
Maturity (quadratic) by Month FE	Y	Y	Y

Mechanism 2: Beliefs and Physical Risk

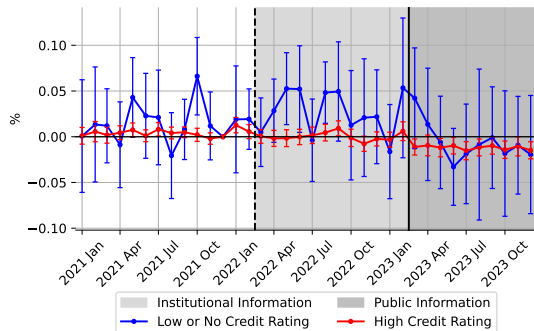
- ▶ Similar **assessment effects across counties** split by Republican vote share and climate concern
- ▶ Small differences in **marginal scores pricing** (E, T) by beliefs
- ▶ **No systematic pattern** in assessment effects by FEMA or Climate Impact Lab risk metrics

Local Risk Split

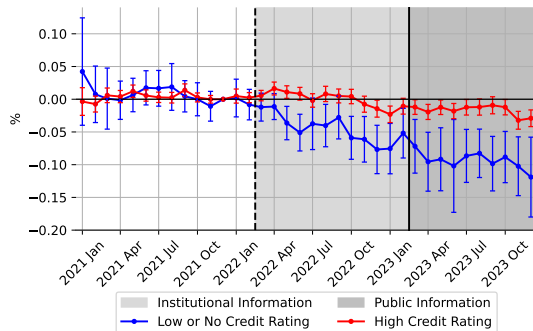
	Share Climate Worry		Share Republican	
	Low	High	Low	High
Novel ESG Assessment				
× Institutional Ownership Period	-1.355** (0.600)	-1.960*** (0.512)	-1.677*** (0.494)	-1.647** (0.645)
× Public Information Period	-3.501*** (0.939)	-4.053*** (0.679)	-3.613*** (0.663)	-4.149*** (0.904)
× Environmental Score (σ)				
× Institutional Ownership Period	-0.159 (0.367)	-0.164 (0.351)	-0.148 (0.353)	-0.160 (0.372)
× Public Information Period	-0.482 (0.514)	-0.910** (0.420)	-0.996** (0.431)	-0.533 (0.519)
× Social Score (σ)				
× Institutional Ownership Period	0.258 (0.360)	1.233*** (0.436)	1.156** (0.428)	0.292 (0.405)
× Public Information Period	1.312** (0.597)	1.327** (0.509)	1.395*** (0.508)	1.381** (0.610)
× Transparency Score (σ)				
× Institutional Ownership Period	0.100 (0.277)	-0.251 (0.317)	-0.180 (0.298)	0.0874 (0.270)
× Public Information Period	-0.157 (0.325)	-0.766** (0.369)	-0.590 (0.363)	-0.167 (0.331)
Ex Ante Labeled				
× Institutional Ownership Period	1.222 (1.048)	2.514 (1.615)	2.146 (1.495)	1.526 (1.342)
× Public Information Period	-0.302 (1.585)	4.143* (2.123)	3.366 (2.037)	0.611 (1.930)
Observations	507,321	518,106	518,459	507,020
CUSIP Fixed Effects	Y	Y	Y	Y
State by tax by Month FE	Y	Y	Y	Y
Credit Rating by Month FE	Y	Y	Y	Y
Trade Size Bins by Month FE	Y	Y	Y	Y
ln(Size), Coupon, Duration (linear) by Month FE	Y	Y	Y	Y
Placement Type Bins by Month FE	Y	Y	Y	Y
Maturity (quadratic) by Month FE	Y	Y	Y	Y

Mechanism 3: Bond Characteristics

A. Bonds with general obligation funding



B. Bonds with revenue funding



- ▶ Subset bonds by credit rating, revenue vs. general obligation structure, and liquidity
- ▶ **Assessment effects largest for low-rated ($< \text{AA-}$), revenue-backed bonds**
- ▶ No evidence that coordination/liquidity drives spread compression

Liquidity Split

Appendix: Baseline Results Tabulated

Logistic Model Estimates Describing Selection of Green and Sustainability Bond Labels Among Eligible Bonds

	(1)	(2)	(3)	(4)
Environmental Score	0.937*** (0.214) 0.000		0.980*** (0.203) 0.000	0.936*** (0.212) 0.000
Share Climate Concerned	0.795 (0.561) 0.156	0.873 (0.538) 0.105		0.917*** (0.342) 0.007
Share Republican	-0.219 (0.486) 0.653	-0.235 (0.472) 0.619	-0.684*** (0.237) 0.004	
FEMA Risk Score	-0.227* (0.137) 0.098	-0.213 (0.135) 0.113	-0.248* (0.137) 0.071	-0.224 (0.137) 0.102
ln(AGI per capita)	0.004 (0.251) 0.989	0.001 (0.250) 0.997	0.213 (0.251) 0.396	-0.053 (0.259) 0.837
Unemployment Rate	0.019 (0.164) 0.906	0.029 (0.160) 0.857	0.072 (0.174) 0.679	0.047 (0.149) 0.754
Share Itemizing	0.060 (0.191) 0.754	0.106 (0.184) 0.564	-0.043 (0.190) 0.821	0.082 (0.199) 0.681
Share Hispanic or Nonwhite	-0.833*** (0.209) 0.000	-0.871*** (0.201) 0.000	-0.624*** (0.168) 0.000	-0.825*** (0.217) 0.000
Share Elderly	-0.154 (0.139) 0.268	-0.160 (0.136) 0.239	-0.133 (0.137) 0.333	-0.160 (0.142) 0.260
Share College	-0.423* (0.244) 0.083	-0.443* (0.238) 0.063	-0.416* (0.230) 0.070	-0.302* (0.271) 0.264
ln(Par Value)	0.206* (0.106) 0.052	0.279*** (0.102) 0.006	0.224** (0.106) 0.035	0.201* (0.106) 0.057
Observations	2,660	2,660	2,660	2,660

Appendix: Baseline Results Tabulated

Logistic Model Estimates Describing Selection of Social Bond Labels Among Eligible Bonds

	(1)	(2)	(3)	(4)
Social score	0.365 (0.245)		0.363 (0.247)	0.375 (0.250)
	0.137		0.141	0.133
Share Climate Concerned	-0.182 (0.602)	-0.170 (0.611)		1.165*** (0.427)
	0.763	0.781		0.006
Share Republican	-1.998*** (0.438)	-2.001*** (0.431)	-1.873*** (0.351)	
	0.000	0.000	0.000	
FEMA Risk Score	-0.059 (0.368)	-0.008 (0.358)	-0.048 (0.359)	-0.131 (0.347)
	0.873	0.981	0.893	0.707
ln(AGI per capita)	0.163 (0.461)	0.142 (0.478)	0.126 (0.462)	-0.389 (0.544)
	0.723	0.766	0.784	0.474
Unemployment Rate	-0.384* (0.207)	-0.415* (0.212)	-0.393** (0.199)	-0.169 (0.230)
	0.063	0.050	0.048	0.462
Share Itemizing	-0.551 (0.537)	-0.559 (0.532)	-0.547 (0.561)	-0.387 (0.602)
	0.304	0.293	0.330	0.520
Share Hispanic or Nonwhite	-0.769** (0.317)	-0.738** (0.315)	-0.812*** (0.271)	-0.845** (0.345)
	0.015	0.019	0.003	0.014
Share Elderly	-0.159 (0.230)	-0.144 (0.241)	-0.167 (0.236)	-0.311 (0.236)
	0.491	0.549	0.481	0.186
Share College	-0.586* (0.307)	-0.558* (0.322)	-0.592* (0.311)	0.296 (0.262)
	0.056	0.083	0.057	0.259
ln(Par Value)	0.159 (0.157)	0.171 (0.155)	0.156 (0.154)	0.107 (0.150)
	0.310	0.268	0.311	0.476
Observations	4,336	4,336	4,336	4,337

Appendix: Baseline Results Tabulated

Pooled difference-in-differences estimates of information intervention on spreads

	Δ Spread (basis points)			
	(1)	(2)	(3)	(4)
Novel ESG Assessment				
× Institutional Ownership Period	-1.269*** (0.384)	-1.241*** (0.406)	-1.289*** (0.406)	-1.681*** (0.409)
× Public Information Period	-3.256*** (0.518)	-3.293*** (0.537)	-3.412*** (0.541)	-3.826*** (0.541)
× Environmental Score (σ)				
× Institutional Ownership Period	-0.178 (0.245)	-0.186 (0.255)	-0.193 (0.254)	-0.146 (0.254)
× Public Information Period	-0.804** (0.297)	-0.813** (0.330)	-0.839** (0.329)	-0.814** (0.324)
× Social Score (σ)				
× Institutional Ownership Period	0.978*** (0.319)	0.974*** (0.335)	0.887** (0.329)	0.859** (0.317)
× Public Information Period	1.547*** (0.322)	1.544*** (0.373)	1.442*** (0.372)	1.445*** (0.336)
× Transparency Score (σ)				
× Institutional Ownership Period	-0.0322 (0.191)	0.0110 (0.193)	0.00574 (0.192)	-0.0880 (0.191)
× Public Information Period	-0.338 (0.241)	-0.279 (0.259)	-0.288 (0.259)	-0.415* (0.243)
Ex Ante Labeled				
× Institutional Ownership Period	2.750** (1.057)	2.785** (1.151)	2.433** (1.112)	2.225* (1.142)
× Public Information Period	3.737** (1.555)	3.820** (1.639)	3.339** (1.589)	3.037* (1.566)
Observations	1,070,347	1,070,347	1,070,347	1,070,347
CUSIP Fixed Effects	Y	Y	Y	Y
State by tax by Month FE	Y	Y	Y	Y
Credit Rating by Month FE	Y	Y	Y	Y
Trade Size Bins by Month FE	Y	Y	Y	Y
ln(Size), Maturity, Coupon (linear) by Month FE	Y	Y	Y	Y
Duration (linear) by Month FE		Y	Y	Y
Placement Type Bins by Month FE			Y	Y
Maturity (quadratic) by Month FE				Y

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Appendix: Robustness Tests

Outcome measurement

	Δ Spread	Δ Spread (pre-tax)	Δ Yield	Δ Spread
	(1)	(2)	(3)	(4)
Novel ESG Assessment				
× Institutional Ownership Period	-1.632*** (0.401)	-1.768*** (0.427)	-0.779 (0.522)	-0.824** (0.372)
× Public Information Period	-3.725*** (0.540)	-3.594*** (0.580)	-2.814*** (0.567)	-2.417*** (0.395)
× Environmental Score (σ)				
× Institutional Ownership Period	-0.122 (0.250)	-0.106 (0.255)	-0.154 (0.275)	0.152 (0.219)
× Public Information Period	-0.752** (0.323)	-0.823** (0.335)	-0.799** (0.365)	-0.0577 (0.295)
× Social Score (σ)				
× Institutional Ownership Period	0.839** (0.314)	0.915** (0.339)	0.936** (0.350)	0.196 (0.296)
× Public Information Period	1.406*** (0.335)	1.569*** (0.389)	1.507*** (0.366)	0.223 (0.335)
× Transparency Score (σ)				
× Institutional Ownership Period	-0.0695 (0.191)	-0.149 (0.234)	-0.315 (0.203)	0.00415 (0.282)
× Public Information Period	-0.394 (0.242)	-0.507* (0.281)	-0.601** (0.271)	-0.267 (0.281)
Ex Ante Labeled				
× Institutional Ownership Period	2.278* (1.125)	2.156** (1.050)	2.374** (0.999)	2.534** (1.064)
× Public Information Period	3.051* (1.542)	3.078** (1.420)	3.700** (1.431)	-0.232 (1.331)
Observations	1,070,347	1,070,347	1,070,347	936,061
CUSIP Fixed Effects	Y	Y	Y	Y
State by tax by Month FE	Y	Y	Y	Y
Credit Rating by Month FE	Y	Y	Y	Y
Trade Size Bins by Month FE	Y	Y	Y	Y
ln(Size), Coupon, Duration (linear) by Month FE	Y	Y	Y	Y
Placement Type Bins by Month FE	Y	Y	Y	Y
Maturity (quadratic) by Month FE	Y	Y	Y	Y
Liquidity Control by Month FE	Y			
Issuer by Month FE				Y

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Appendix: Robustness Tests

Sample construction

	Δ Spread			
	(1)	(2)	(3)	(4)
Novel ESG Assessment				
× Institutional Ownership Period	-3.456*** (0.704)	-1.754*** (0.438)	-1.513*** (0.403)	-1.694*** (0.418)
× Public Information Period	-4.952*** (0.699)	-3.882*** (0.597)	-3.684*** (0.566)	-3.940*** (0.570)
× Environmental Score (σ)				
× Institutional Ownership Period	0.00941 (0.571)	-0.210 (0.267)	-0.113 (0.261)	-0.267 (0.272)
× Public Information Period	-0.860 (0.546)	-0.921** (0.385)	-0.789** (0.332)	-0.950*** (0.346)
× Social Score (σ)				
× Institutional Ownership Period	1.493** (0.575)	0.719** (0.329)	0.838** (0.317)	1.023*** (0.356)
× Public Information Period	2.269*** (0.525)	1.519*** (0.399)	1.552*** (0.336)	1.461*** (0.373)
× Transparency Score (σ)				
× Institutional Ownership Period	0.558 (0.443)	0.0163 (0.199)	-0.251 (0.194)	-0.00583 (0.205)
× Public Information Period	-0.112 (0.481)	-0.340 (0.270)	-0.570** (0.245)	-0.459 (0.275)
Ex Ante Labeled				
× Institutional Ownership Period	0.437 (1.340)	2.531* (1.358)	0.982 (0.629)	2.298* (1.193)
× Public Information Period	1.600 (1.335)	3.260* (1.854)	1.203 (0.964)	3.096* (1.602)
Observations	2,782,708	936,334	986,555	939,973
CUSIP Fixed Effects	Y	Y	Y	Y
State by tax by Month FE	Y	Y	Y	Y
Credit Rating by Month FE	Y	Y	Y	Y
Trade Size Bins by Month FE	Y	Y	Y	Y
ln(Size), Coupon, Duration (linear) by Month FE	Y	Y	Y	Y
Placement Type Bins by Month FE	Y	Y	Y	Y
Maturity (quadratic) by Month FE	Y	Y	Y	Y
Callable Bonds	Y			
Dropped State		CA	NY	TX

Appendix: Other Mechanisms Tests

Local climate risk

	FEMA Expected Loss Score		CIL Direct Climate Damage	
	Low	High	Low	High
Novel ESG Assessment				
× Institutional Ownership Period	-1.558*** (0.408)	-2.729* (1.368)	-2.233*** (0.578)	-1.079** (0.522)
× Public Information Period	-3.719*** (0.571)	-4.766*** (1.933)	-5.221*** (0.891)	-2.626*** (0.628)
× Environmental Score (σ)				
× Institutional Ownership Period	-0.271 (0.253)	0.778 (0.617)	-0.323 (0.385)	-0.0293 (0.331)
× Public Information Period	-1.070*** (0.339)	0.134 (0.790)	-0.952* (0.526)	-0.631* (0.364)
× Social Score (σ)				
× Institutional Ownership Period	0.756** (0.314)	0.977 (0.744)	1.175** (0.467)	0.484 (0.350)
× Public Information Period	1.342*** (0.374)	1.600 (1.071)	1.440** (0.603)	1.164*** (0.413)
× Transparency Score (σ)				
× Institutional Ownership Period	0.0560 (0.217)	-1.129* (0.631)	-0.0671 (0.294)	-0.110 (0.258)
× Public Information Period	-0.335 (0.277)	-1.187* (0.640)	-0.589 (0.406)	-0.314 (0.300)
Ex Ante Labeled				
× Institutional Ownership Period	2.668** (1.281)	-0.0180 (1.627)	2.385 (1.688)	1.188 (0.990)
× Public Information Period	3.584** (1.678)	-2.395 (2.895)	3.119 (2.078)	0.964 (1.448)
Observations	925,886	99,620	504,782	520,674
CUSIP Fixed Effects	Y	Y	Y	Y
State by tax by Month FE	Y	Y	Y	Y
Credit Rating by Month FE	Y	Y	Y	Y
Trade Size Bins by Month FE	Y	Y	Y	Y
In(Size), Coupon, Duration (linear) by Month FE	Y	Y	Y	Y
Placement Type Bins by Month FE	Y	Y	Y	Y
Maturity (quadratic) by Month FE	Y	Y	Y	Y

Appendix: Other Mechanisms Tests

Liquidity

	Credit Risk		Liquidity Spread	
	Low	High	Low	High
Novel ESG Assessment				
× Institutional Ownership Period	-0.659** (0.308)	-4.013*** (1.323)	-1.500*** (0.499)	-1.745*** (0.523)
× Public Information Period	-2.100*** (0.378)	-9.023*** (2.071)	-2.914*** (0.827)	-4.274*** (0.598)
× Environmental Score (σ)				
× Institutional Ownership Period	-0.0376 (0.217)	-0.506 (0.935)	-0.0506 (0.295)	-0.155 (0.316)
× Public Information Period	-0.634** (0.299)	-1.367 (1.216)	-0.939** (0.367)	-0.630 (0.445)
× Social Score (σ)				
× Institutional Ownership Period	0.596** (0.274)	2.148** (0.874)	0.976*** (0.348)	0.664 (0.398)
× Public Information Period	0.837*** (0.305)	3.896*** (1.163)	1.283*** (0.365)	1.385*** (0.437)
× Transparency Score (σ)				
× Institutional Ownership Period	0.0174 (0.188)	-0.349 (0.788)	-0.0813 (0.212)	-0.133 (0.262)
× Public Information Period	-0.211 (0.221)	-0.791 (0.939)	-0.235 (0.285)	-0.562* (0.319)
Ex Ante Labeled				
× Institutional Ownership Period	2.822** (1.097)	2.891 (2.624)	0.111 (0.749)	4.181** (1.598)
× Public Information Period	3.801** (1.624)	2.192 (3.033)	-0.199 (1.178)	5.489*** (1.924)
Observations	867,478	202,611	316,559	753,502
CUSIP Fixed Effects	Y	Y	Y	Y
State by tax by Month FE	Y	Y	Y	Y
Credit Rating by Month FE	Y	Y	Y	Y
Trade Size Bins by Month FE	Y	Y	Y	Y
ln(Size), Coupon, Duration (linear) by Month FE	Y	Y	Y	Y
Placement Type Bins by Month FE	Y	Y	Y	Y
Maturity (quadratic) by Month FE	Y	Y	Y	Y

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