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Does ESG reporting impact the cost of debt? Evidence from mandatory disclosures around the world

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Outline

Overview

Background

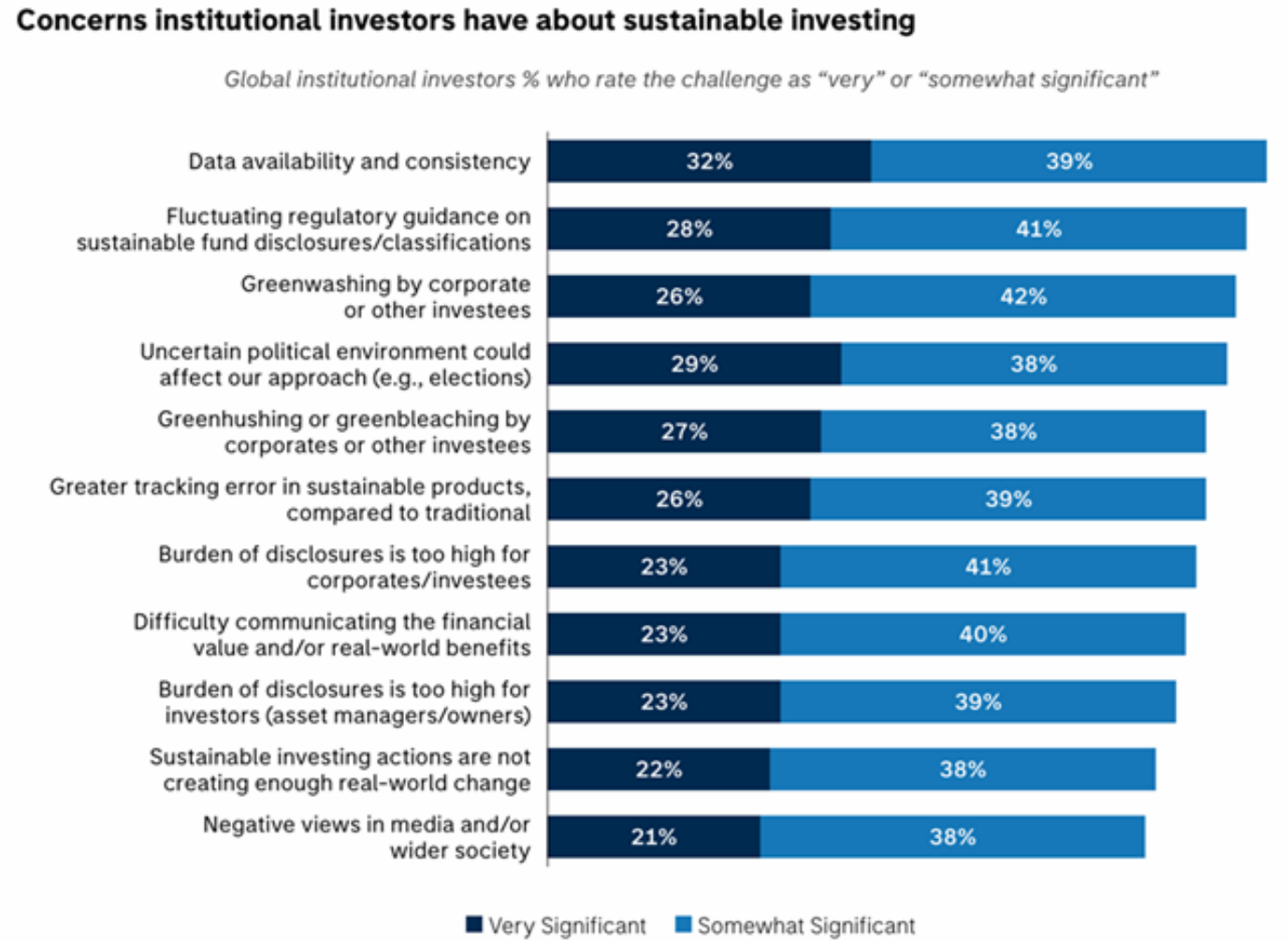
- Recently, an anti-ESG movement emerged. However, sustainable investing is still likely to grow in the coming years.
- According to a recent survey by Morgan Stanley with 901 institutional investors around the world, most institutional investors expect a growth in their sustainable investing activities.

Background

- Surveyed institutional investors practice sustainable investing for both financial and nonfinancial reasons.

Background

- . . . but data remains a major concern!



Overview

Literature Review 1/2

- **The real effects of ESG disclosure/ESG performance**:
  - Better environmental and social performance (Christensen et al. 2017, Downar et al. 2021, Fiechter et al. 2022).
  - Mixed evidence regarding financial performance
    - Positive: increase firm value (Albuquerque et al. 2018).
    - Negative: decrease profitability (Chen et al. 2018); reduce productivity (Christensen et al. 2017).
    - Irrelevant: Downar et al. (2021).
  - Capital structure (Bae et al. 2011, Asimakopoulos et al. 2023) etc.

Literature Review 2/2

- **ESG and cost of capital**:
  - ESG performance: decreases risk (Albuquerque et al. 2018), improves credit rating (Attig et al. 2013) and access to finance (Cheng et al. 2014), bank loan rate (Goss and Roberts 2011).
  - Green corporate issuance premium (e.g., Caramichael and Rapp, 2024; Zerbib, 2019), "sin" industry punishment (El Ghoul et al. 2011; Chava 2014). , studies such as Aswani (2024) find that ESG investments can actually increase the cost of capital. ESG performance may reflect better firm fundamentals (e.g., Ahn et al., 2024; Hong et al., 2012).

Contribution

1. **Real effects of ESG disclosure** (Chen et al. 2018, Gibbons 2024). We contribute to this literature by analyzing the role of ESG mandates in firms' cost of borrowing from the bond markets.
   - We uncover the channels through which firms achieve lower spreads in the post-mandate period.
2. **The role of ESG information**. Our findings support both the information asymmetry and clientele effects channels of ESG information (Krueger 2015, Gibbons 2024, Krueger et al. 2024).
3. **Relationship lending** (Ma et al. 2019, Aoki 2021). We analyze how firms that build relationships with banks take advantage of monitoring and benefit more in reducing bond spreads.

Overview

Sample

We create a unique sample made up from various sources:

- Bond data from Worldscope.
  - Corporate bonds issued from 2004Q1 to 2023Q4.
- Firm-level variables from Worldscope.
- Country-level variables from the World Bank and various other sources.
- Loan-level variables from DealScan.

The final sample contains 373,402 bond-quarter observations of 24,052 bonds issued by 2,774 firms, across 57 countries.

Main Variables

- Dependent variable: Bond spread
  - Quarterly data, 2004Q1 to 2023Q4
  - Datastream Worldscope database
- Independent variable: ESG mandates (i.e., *post*)
  - Krueger et al. (2024 JAR)
  - 38 countries that introduced ESG disclosure mandates.
- Staggered DiD model setting:

$$Y_{f,b,c,t} = \alpha + \beta_1 \text{Mandatory ESG Discl.}_{f,c,t} + \delta X_{f,c,t-1} + FE + \varepsilon_{f,b,c,t}$$

  - Controls: firm size, ROA, tangible assets, leverage, cash holdings, dividend, Tobin's Q, R&D, and ESG score
  - Fixed effects: bond IDs, firm IDs, and year.

ESG disclosure mandates (Krueger et al. 2024)

Country/Region	Mandatory ESG disclosure year
Argentina	2008
Australia	2003
Austria	2016
Belgium	2009
Bulgaria	2016
Canada	2004
Chile	2015
China	2008
Cyprus	2016
Denmark	2016
Finland	2016
France	2001
Germany	2016
Greece	2006
Hong Kong	2015
Hungary	2016
India	2015
Indonesia	2012
Ireland	2016

Country/Region	Mandatory ESG disclosure year
Italy	2016
Malaysia	2007
Malta	2016
Netherlands	2016
Norway	2013
Pakistan	2009
Peru	2015
Philippines	2011
Poland	2016
Portugal	2010
Romania	2016
Singapore	2016
Slovenia	2017
South Africa	2010
Spain	2012
Sweden	2016
Taiwan	2019
Turkey	2014
United Kingdom	2013

Summary Statistics 1/2

- The average bond spread in our sample is 2.1%
- 27% of observations belong to post-mandate periods.

	N	Mean	St.D.	P25	Median	P75
Bond Spread (%)	373,402	2.098	5.435	0.606	1.319	2.367
Mandatory ESG Discl.	373,402	0.270	0.444	0.000	0.000	1.000
Firm Size (in USD)	373,402	17.200	1.457	16.240	17.247	18.199
ROA	373,402	0.037	0.067	0.012	0.035	0.066
Tangible	373,402	0.320	0.233	0.119	0.280	0.459
Leverage	373,402	1.392	3.009	0.572	1.043	1.837
Cash Holding	373,402	0.081	0.071	0.029	0.062	0.112
Dividend	373,402	0.021	0.022	0.005	0.014	0.028
Tobin's Q	373,402	1.372	1.071	0.723	0.995	1.601
R&D	373,402	0.015	0.027	0.000	0.002	0.016
ESG Score	373,402	4.032	0.546	3.917	4.235	4.376

Summary Statistics 2/2

- On average, the bond issuer's home country has a GDP per capita of USD10,614 and a growth rate of 1.5%.
- 12% of the home country's energy comes from renewable sources, on average.
- We also observe variations in terms of unemployment rates, corruption control, government efficiency, etc.

	N	Mean	St.D.	P25	Median	P75
GDP	428,712	10.614	0.675	10.487	10.901	10.996
GDP Growth	428,712	1.535	2.897	0.93	1.6	2.46
Rule of Law	353,599	1.329	0.570	1.36	1.51	1.61
Unemployment	416,990	5.087	2.008	3.65	4.55	6.17
Political Stability	353,599	0.421	0.499	0.03	0.42	0.85
Corruption Control	428,712	1.124	0.627	1.02	1.29	1.46
Environmental Performance	417,533	15.504	14.756	5.25	5.7	24.72
Tax	348,219	13.204	4.701	10.34	11.44	13.22
Renewable Energy	303,227	12.18	9.277	8.45	10.12	12.6
Government Efficiency	353,599	1.365	0.428	1.34	1.47	1.57

Overview

Baseline

- Control variables include the previously mentioned firm-year characteristics (size, ROA, PPE, debt ratio, cash, dividend, Tobin's Q, R&D, and ESG score).
- Across our specifications, we find that bond spreads decrease for treated firms after the policy change.

	Bond Spread$_t$(%)		
	(1)	(2)	(3)
Mandatory ESG Discl.$_t$	-0.490***	-0.574***	-0.615***
	(-4.038)	(-4.600)	(-4.752)
Controls	No	Yes	Yes
Bond FEs	Yes	Yes	Yes
Quarter FEs	Yes	Yes	No
Industry-Quarter FEs	No	No	Yes
Observations	372,641	372,641	372,355
Adjusted R-squared	0.637	0.651	0.692

Robustness

- To check the robustness of our baseline finding, we (1) remove US and Japan observations, (2) add country-year controls, (3) use a [-5, 5] year window, or (4) use a [-3, 3] year window around the policy changes.

	Bond Spread$_t$(%)			
	(1)	(2)	(3)	(4)
Mandatory ESG Discl.$_t$	-0.511***	-0.629***	-0.596***	-0.480***
	(-4.251)	(-4.123)	(-4.865)	(-4.839)
Sample	Excl. US & JP	Full	[-5, 5]	[-3, 3]
Country-year Controls	No	Yes	No	No
Bond FEs	Yes	Yes	Yes	Yes
Quarter FEs	Yes	Yes	Yes	Yes
Observations	154,401	221,453	297,970	285,938
Adjusted R-squared	0.717	0.667	0.696	0.694

Parallel Trend

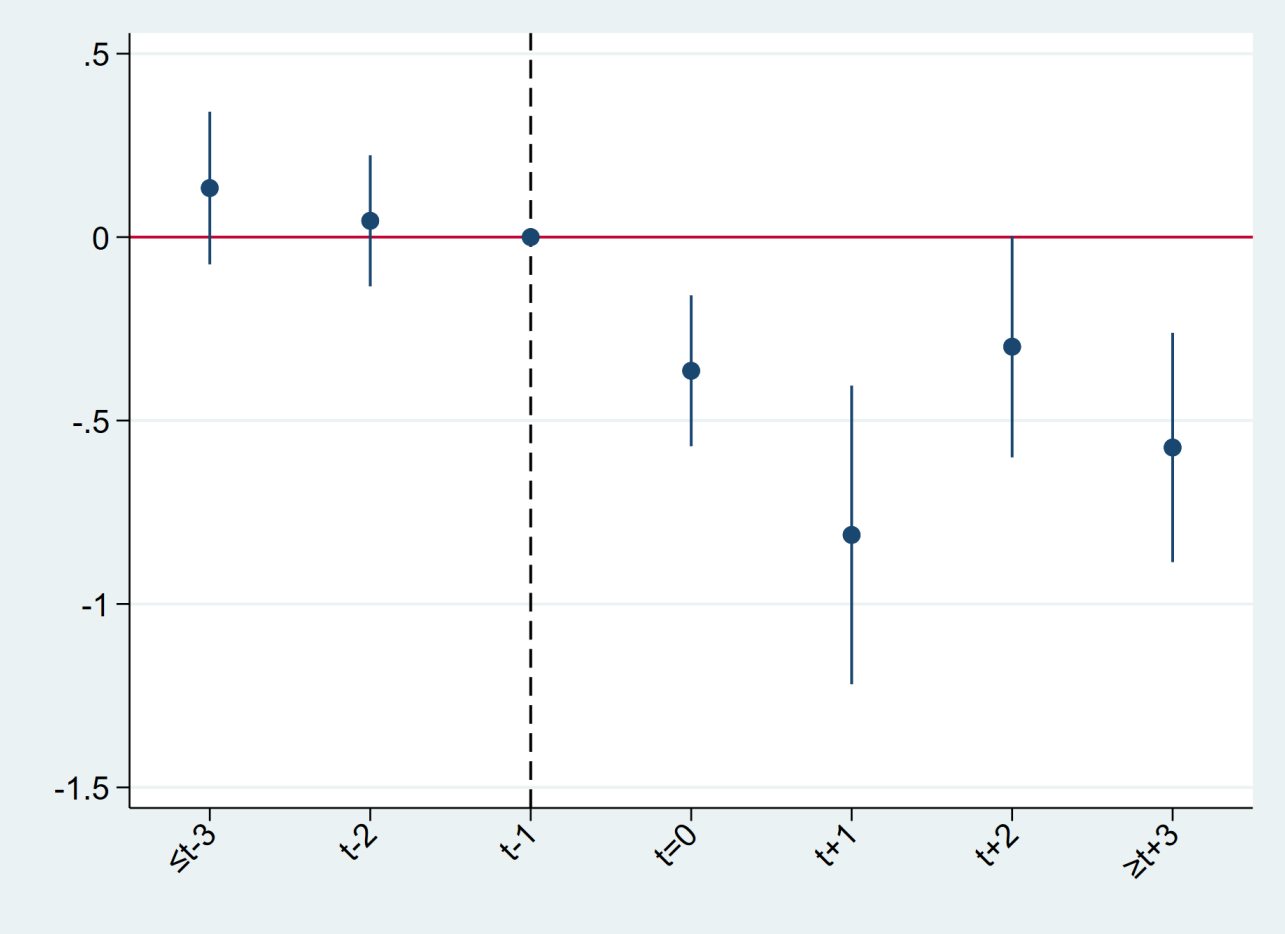


Figure 1: Parallel trend

Parallel Trend

	$Bond\ Spread_t(\%)$
	(1)
T-3 and Before	0.134
	(1.280)
T-2	0.044
	(0.494)
T	-0.364***
	(-3.525)
T+1	-0.812***
	(-3.970)
T+2	-0.299*
	(-1.971)
T+3 and After	-0.574***
	(-3.653)
Control variables	Yes
Bond FEs	Yes
Quarter FEs	Yes
Observations	372,641
Adjusted R-squared	0.690

Robustness: Correcting for the potential bias of the traditional DiD estimator 1/2

- Heterogeneous treatment effects across different units and over time may bias the traditional diff-in-diff estimator. Instead of assuming a constant treatment effect for all units. We confirm our results with the methods of De Chaisemartin and D'haultfoeuille (2020), Callaway and Sant'Anna (2021), and Borusyak, Jaravel, and Spiess (2024).

	Bond Spread$_t$(%)				
		DCDH		CSA	BJS
	(1)	(2)	(3)	(4)	(5)
Mandatory ESG Discl.$_t$	-0.322***	-0.165***	-0.253***	-0.368***	-0.301**
	(-5.911)	(-3.338)	(-8.402)	(-2.784)	(-1.999)

Robustness: Correcting for the potential bias of the traditional DiD estimator 2/2

- An alternative method is to use stacked regressions. Our results are also similar with that method.

	Bond Spread$_t$(%)		
	(1)	(2)	(3)
Mandatory ESG Discl.$_t$	-0.353***	-0.560***	-0.500***
	(-4.048)	(-4.753)	(-5.129)
Observations	109,732	222,741	342,450
Window	[-4Q, 4Q]	[-8Q, 8Q]	[-12Q, 12Q]
Control Variables	Yes	Yes	Yes
Cohort-Bond FEs	Yes	Yes	Yes
Cohort-Quarter FE	Yes	Yes	Yes
Adjusted R-squared	0.863	0.727	0.722

Robustness: Causal Forest

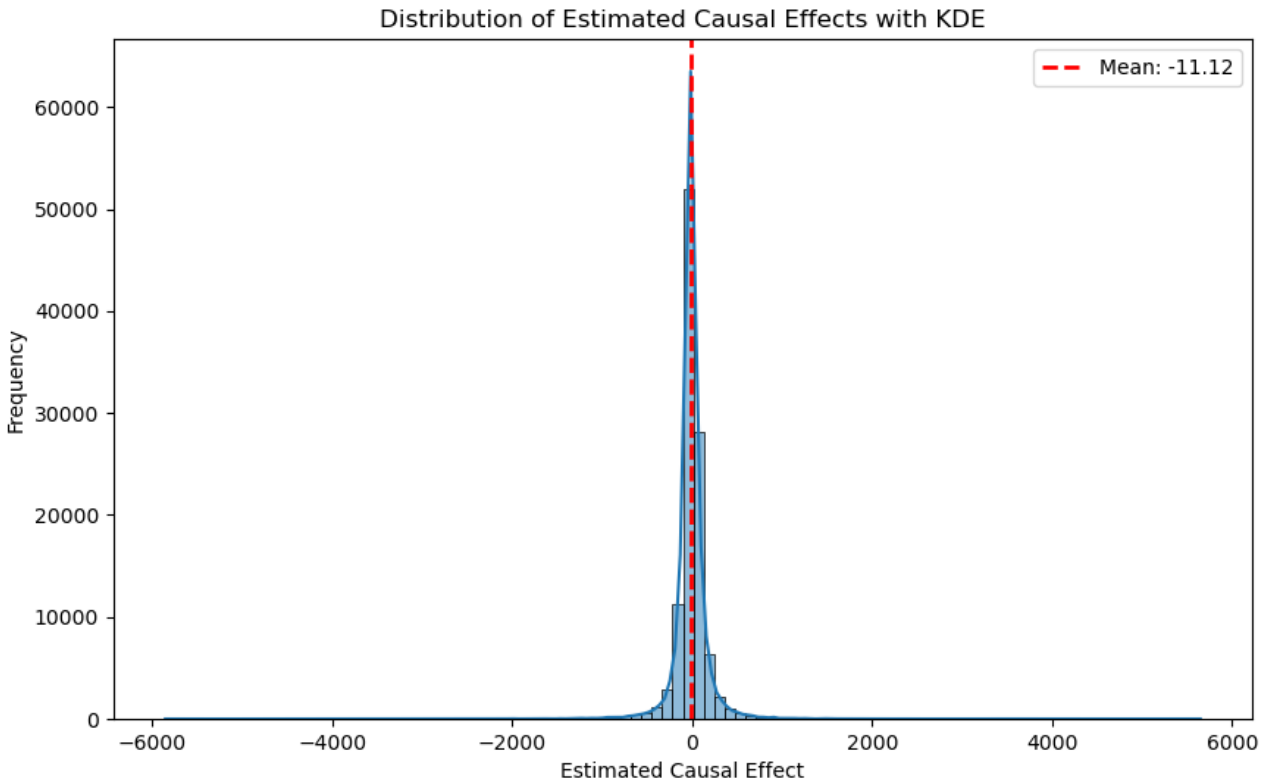


Figure 2: Non-parametric estimate: Causal forest

Channel: Information Asymmetry 1/3

- Recall our hypotheses on information asymmetry
- H2A: The effect of the mandatory ESG disclosure on bond spreads is stronger for firms associated with high information asymmetry.
- H2B: The effect of the mandatory ESG disclosure on bond spreads is weaker for firms operating in sectors with poor ESG performance.We interact our post-mandate variable with proxies of higher information asymmetry (i.e., unrated bonds and junk bonds).

Channel: Information Asymmetry 2/3

- We interact our post-mandate variable with proxies of higher information asymmetry (i.e., unrated bonds and junk bonds).
- Firms that suffer from higher information asymmetry benefit the most from the introduction of the mandates.

	Bond Spread$_t$ (%)	
	(1)	(2)
Mandatory ESG Discl.$_t$	-0.550***	-0.547***
	(-4.45)	(-4.33)
Mandatory ESG Discl.$_t$ × *Unrated*$_{f,t}$	-1.287*	—
	(-1.96)	
Mandatory ESG Discl.$_t$ × *Junk Bond*$_{f,t}$	—	-0.572*
		(-1.67)
Control Variables	Yes	Yes
Bond FEs	Yes	Yes
Quarter FEs	Yes	Yes
Observations	372,641	372,641
Adjusted R-squared	0.689	0.689

Channel: Information Asymmetry 3/3

- We interact our post-mandate variable with proxies of poor environmental performance (i.e., top-polluting sectors and hard-to-abate sectors). Firms that are likely to disclose bad information due to the mandates have limited benefits from the implementation of ESG reporting mandates.

	Bond Spread$_t$ (%)	
	(1)	(2)
Mandatory ESG Discl.$_t$	-0.624***	-0.630***
	(-4.92)	(-4.99)
Mandatory ESG Discl.$_t$ × *HighPolluter*	0.479**	—
	(2.10)	
Mandatory ESG Discl.$_t$ × *Hard To Abate*	—	0.471**
		(2.067)
Control Variables	Yes	Yes
Bond FEs	Yes	Yes
Quarter FEs	Yes	Yes
Observations	372,641	372,641
Adjusted R-squared	0.690	0.690

Channel: Clientele Effects 1/2

- Recall our hypothesis on the clientele effect (H3): The effect of the mandatory disclosure is stronger for firms with low institutional ownership in the pre-mandate period.

Channel: Clientele Effects 2/2

- We interact our post-mandate variable with proxies of low institutional ownership.
- We find that firms with low ex-ante institutional ownership enjoy a stronger reduction in their bond spreads.

	Bond Spread$_t$ (%)	
	(1)	(2)
Mandatory ESG Discl.$_t$	-0.423**	-0.496***
	(-2.545)	(-3.530)
Mandatory ESG Discl.$_t$ × *Low IO*	-0.325**	—
	(-2.087)	
Mandatory ESG Discl.$_t$ × *Low IO country*	—	-0.336**
		(-2.432)
Control Variables	Yes	Yes
Bond FEs	Yes	Yes
Quarter FEs	Yes	Yes
Observations	372,641	372,641
Adjusted R-squared	0.690	0.690

Channel: Bank Monitoring 1/2

- Recall our hypothesis on the bank monitoring effect (H4): The negative association between ESG mandatory disclosures and bond spreads is stronger for relationship borrowers.
- We interact our post-mandate variable with proxies of relationship bank lending.
- The effect of the disclosures strengthens for relationship borrowers, who benefit from more stringent bank monitoring.

Channel: Bank Monitoring 2/2

	Bond Spread$_t$(%)			
	(1)	(2)	(3)	(4)
Mandatory ESG Discl.$_t$	-0.426***	-0.426***	-0.431***	-0.431***
	(-3.204)	(-3.203)	(-3.200)	(-3.201)
REL Dummy (5y)	0.741***			
	(2.650)			
Mandatory ESG Discl.$_t$ × *REL Bor*(5*y*)	-0.711**			
	(-2.069)			
REL Dummy (10y)		0.718**		
		(2.637)		
Mandatory ESG Discl.$_t$ × *REL Bor*(10*y*)		-0.691**		
		(-2.078)		
Num. of REL (8y)			0.491***	
			(2.962)	
Mandatory ESG Discl.$_t$ × *Num. REL*(5*y*)			-0.511***	
			(-2.794)	
Num. of REL (10y)				0.469***
				(2.939)
Mandatory ESG Discl.$_t$ × *Num. REL*(10*y*)				-0.490***
				(-2.760)
Control Variables	Yes	Yes	Yes	Yes
Bond FEs	Yes	Yes	Yes	Yes
Quarter FE	Yes	Yes	Yes	Yes
Observations	115,786	115,786	115,786	115,786
Adjusted R-squared	0.655	0.655	0.655	0.655

Overview

Conclusion 1/2

- Whether ESG reporting increases or decreases financing costs is theoretically unclear, as arguments can be made in both directions.
- In this study, we leverage the staggered implementation of ESG reporting mandates to analyze whether ESG disclosure influences firms' cost of capital.
- Using a large international sample of corporate bonds, we find that ESG disclosure helps firms decrease their cost of financing. Importantly, our results hold after controlling for ESG ratings and various country-level characteristics that could have confounded the effect.

Conclusion 2/2

- Our findings suggest that both a reduction in information asymmetry and clientele effect (i.e., a preference among some investors for securities with ESG attributes) drive the results. The effects are also stronger for firms with preexisting bank lending relationships.
- The clientele effect may weaken in the future, as the world faces a growing anti-ESG movement and several large investors tone down their ESG preferences.

Comments are welcome!

Thank You!