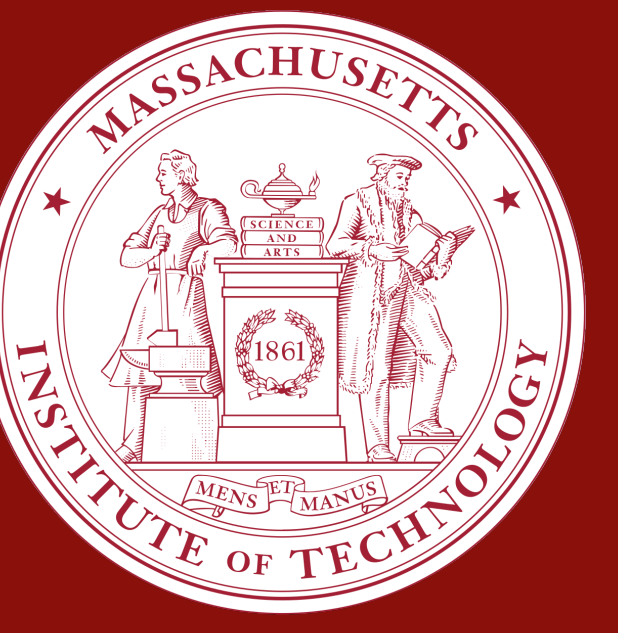


Investment and Governance: Through the Lens of Sustainability

Jitendra Aswani & Roberto Rigobon

MIT Sloan



Abstract

Using 3,944 sustainable bond issuances by public firms from 2013 to 2022, this paper examines the causal effect of sustainable investment on the adoption of sustainable governance practices. Leveraging a heteroskedasticity-based identification strategy, the analysis reveals that a 1% increase in sustainable debt (scaled by total debt) increases the likelihood of sustainable governance adoption by 9%. These sustainable governance practices, in turn, drive a 16% increase in environmental performance. Conversely, firms with stronger environmental performance are less likely to adopt sustainable governance. The findings are robust to various definitions of sustainable governance and environmental outcomes, as well as a battery of other checks.

Motivation and Data

Does sustainable borrowing lead to organizational change towards sustainability?

Global Public Firms (2013 - 2022)

- Databases - Bloomberg Global Fixed Income, Environmental Finance, BoardEx, Refinitiv, Global Compustat.
- Information on organizational change towards sustainability comes from BoardEx and Refinitiv.
- Organizational change towards sustainability comprises the formation of an ESG committee, hiring a sustainability officer, and similar other changes.
- The dataset from BoardEx encompasses 67,818 firm-year observations across 10,970 firms.
- Within the sample period, approximately 3,718 firms, representing 29,418 firm-year instances, implemented organizational changes to enhance sustainability.

Identification through Heteroskedasticity: Rigobon (2003)

A simplified simultaneous model,

$$SG_t = \beta SD_t + \epsilon_t$$

$$SD_t = \phi SG_t + \eta_t$$

SG and SD are sustainable governance and sustainable debt, adjusted for country fixed effects and industry fixed effects.

$$\text{Covariance Matrix, } \Omega = \frac{1}{(1-\beta\phi)^2} \begin{bmatrix} \beta^2\sigma_\eta^2 + \sigma_\epsilon^2 & \beta\sigma_\eta^2 + \phi\sigma_\epsilon^2 \\ \beta\sigma_\eta^2 + \phi\sigma_\epsilon^2 & \phi^2\sigma_\epsilon^2 + \sigma_\eta^2 \end{bmatrix}$$

- Problem** - Three moments (knowns) - variance of SD_t , SG_t , and the covariance between SD_t and SG_t , and four unknowns - β , ϕ , σ_ϵ^2 and σ_η^2 .
- Solution** - The relative difference in variances of SD_t and SG_t in different regimes helps in identifying the model.

Covariance matrix in different regimes,

$$\Omega_s = \frac{1}{(1-\beta\phi)^2} \begin{bmatrix} \beta^2\sigma_{\eta,s}^2 + \sigma_{\epsilon,s}^2 & \beta\sigma_{\eta,s}^2 + \phi\sigma_{\epsilon,s}^2 \\ \beta\sigma_{\eta,s}^2 + \phi\sigma_{\epsilon,s}^2 & \phi^2\sigma_{\epsilon,s}^2 + \sigma_{\eta,s}^2 \end{bmatrix}$$

In this new set of systems, there are six unknowns - β , ϕ , $\sigma_{\eta,1}$, $\sigma_{\eta,2}$, $\sigma_{\epsilon,1}$, $\sigma_{\epsilon,2}$ and two covariance matrices which provides six equations. If all these equations are independent, the identification problem is resolved.

Sustainable Investment on Adoption of Sustainable Governance

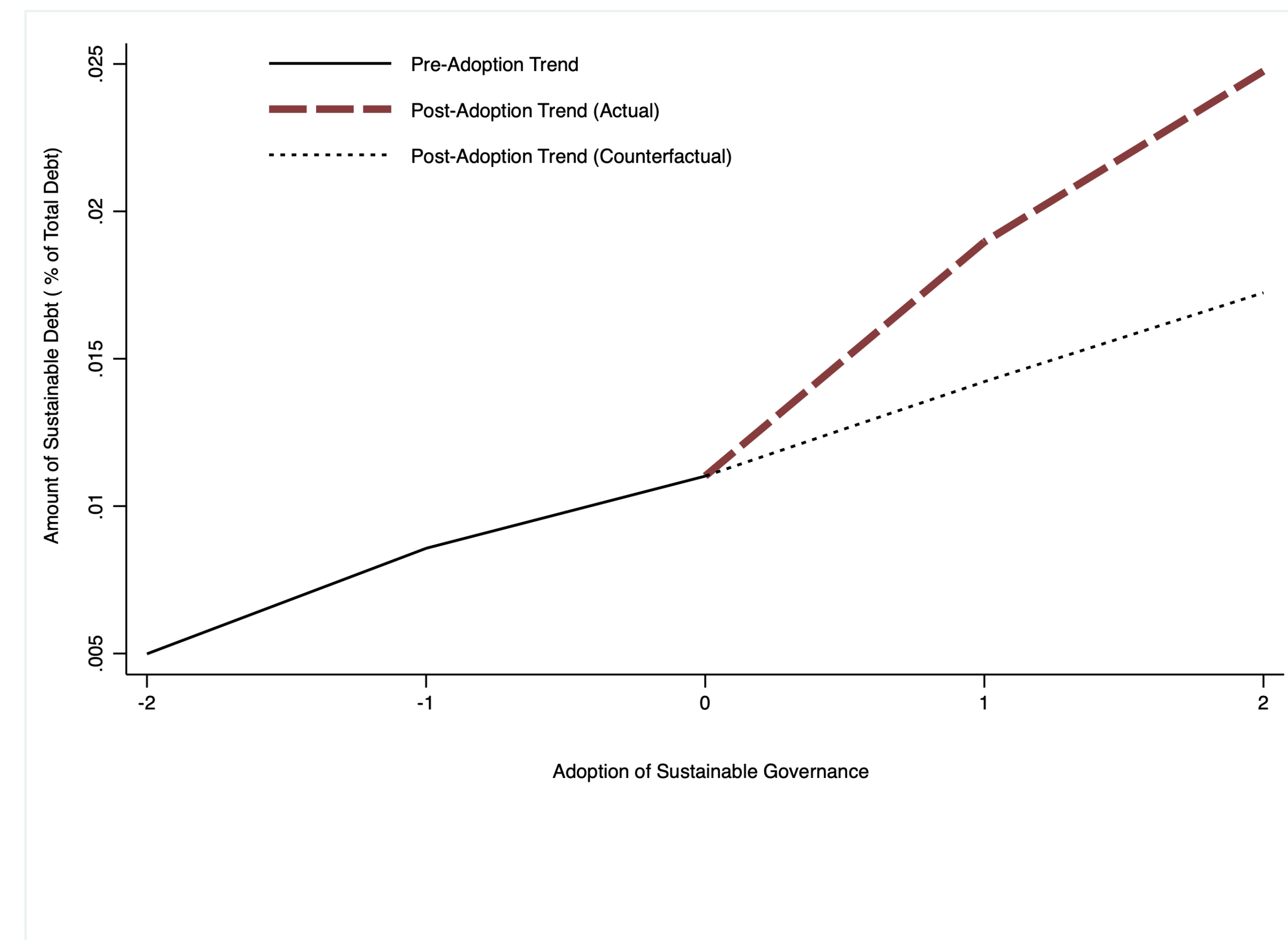


Figure 1. Event Study

Structured Parameters and Regression Analysis

Table 1. Sustainable Debt (Amount) and Sustainable Governance

VARIABLES	(1) Sus Gov	(2) Sus Debt	(3) Sus Gov	(4) Sus Debt
Sus Debt	0.092** (0.065)		0.055*** (0.012)	
Sus Debt (Lag)	0.049 (0.138)	0.343*** (0.049)	0.037*** (0.014)	0.329*** (0.005)
Sus Gov (Lag)	0.971*** (0.022)	0.041*** (0.012)	0.799*** (0.004)	0.010*** (0.002)
Sus Gov		0.002 (0.008)		0.007*** (0.002)
Constant	0.055*** (0.002)	0.003*** (0.001)	0.151*** (0.006)	-0.008*** (0.002)
Observations	51,811	51,811	51,811	51,811
Regime	Structured	Structured	OLS	OLS
Industry	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes

Distribution of Structured Parameters

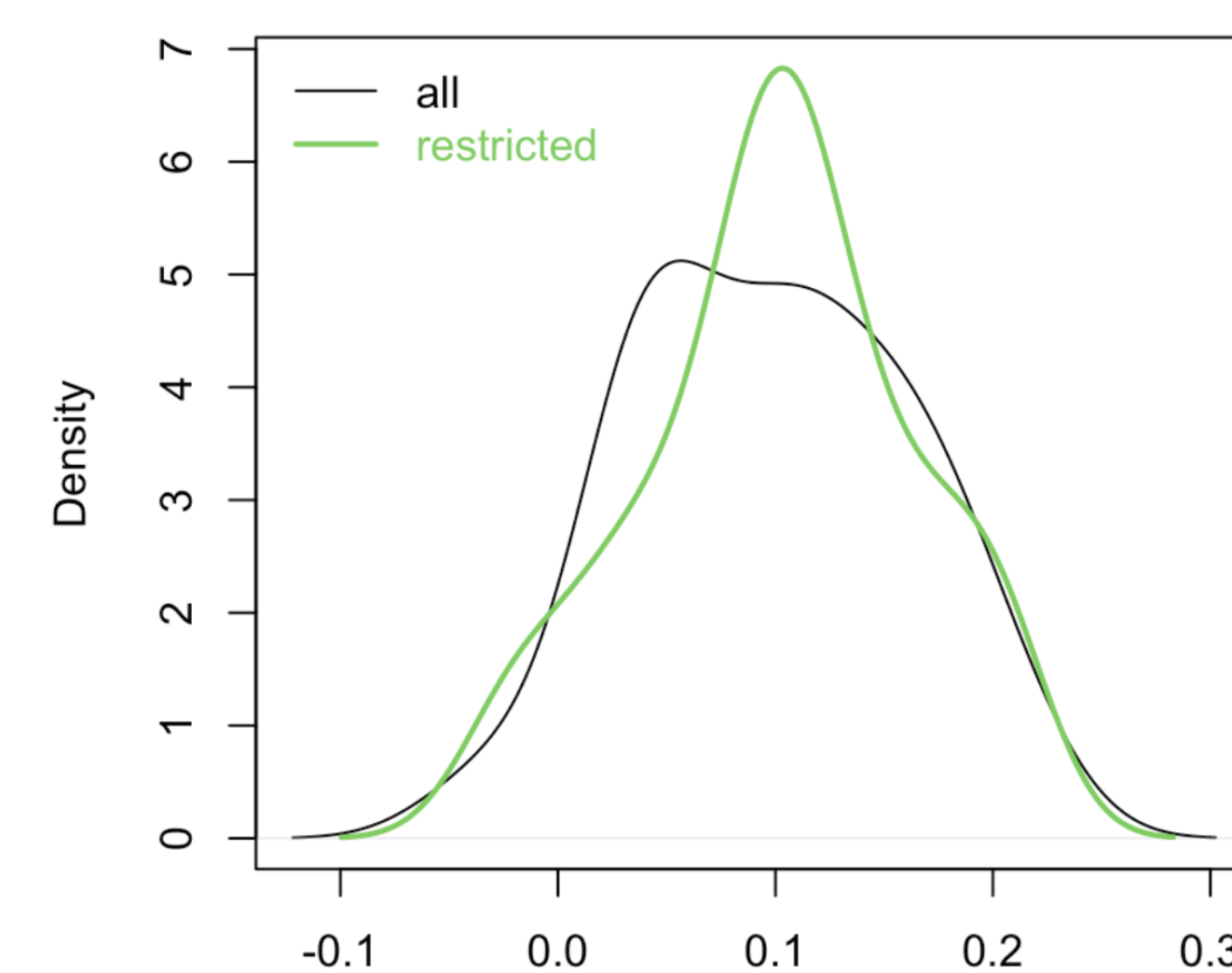


Figure 2. β

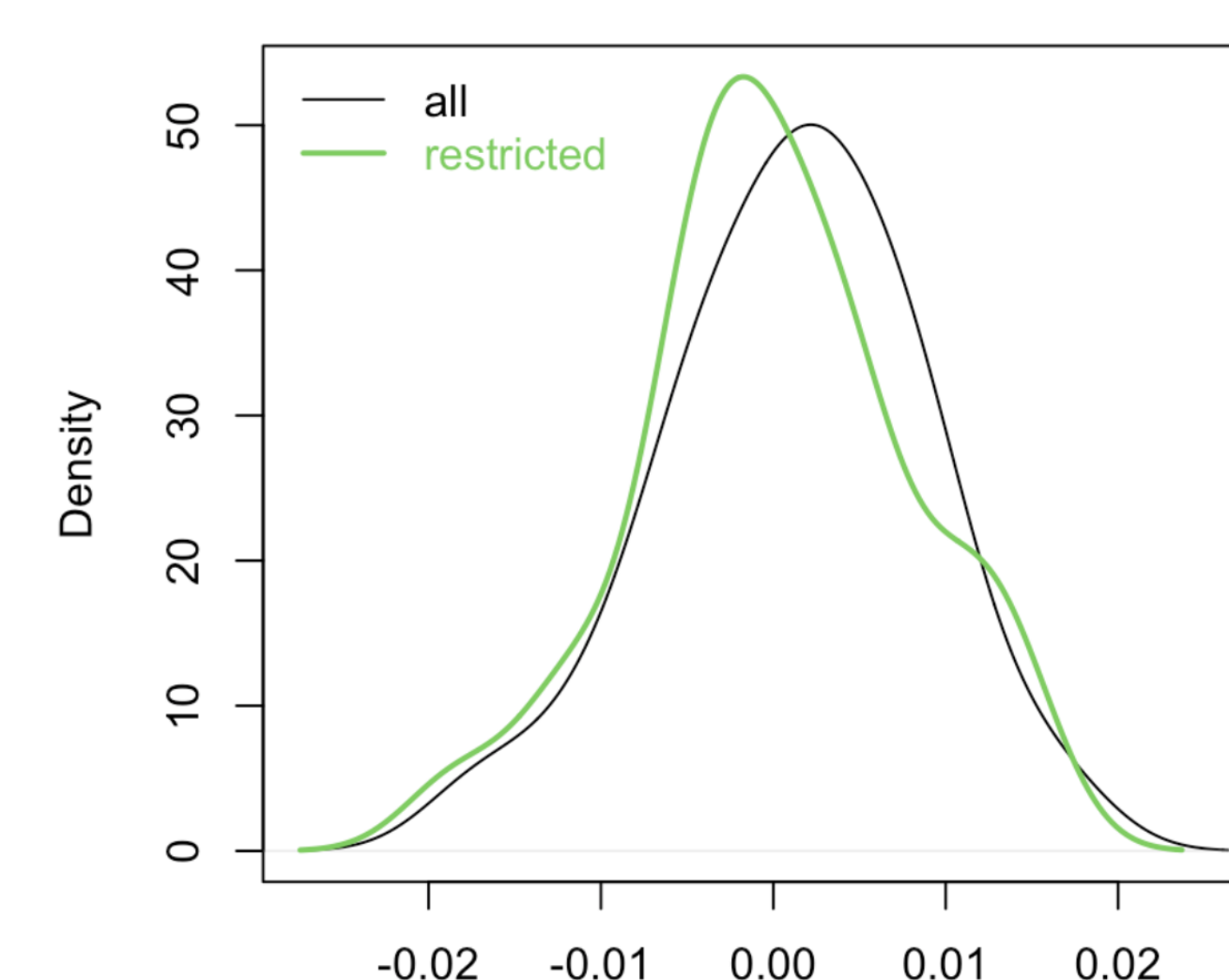


Figure 3. ϕ

Sustainable Governance and Environmental Performance

Table 2. Sustainable Governance, ESG and Environmental Scores

VARIABLES	(1) ESG-Score (t+1)	(2) ESG-Score (t+5)	(3) E-Score (t+1)	(4) E-Score (t+5)
Sustainable Governance	0.125*** (0.004)	0.151*** (0.016)	0.149*** (0.005)	0.192*** (0.023)
Sustainable Governance (t-1)	0.072*** (0.004)	-0.084*** (0.032)	0.086*** (0.006)	-0.076* (0.045)
Constant	0.302*** (0.007)	0.431*** (0.010)	0.167*** (0.009)	0.307*** (0.014)
Observations	30,090	11,952	30,090	11,952
R-squared	0.231	0.186	0.289	0.217
Year	Yes	Yes	Yes	Yes
Industry	Yes	Yes	Yes	Yes
Country	Yes	Yes	Yes	Yes

Structured Parameters - Governance and Performance

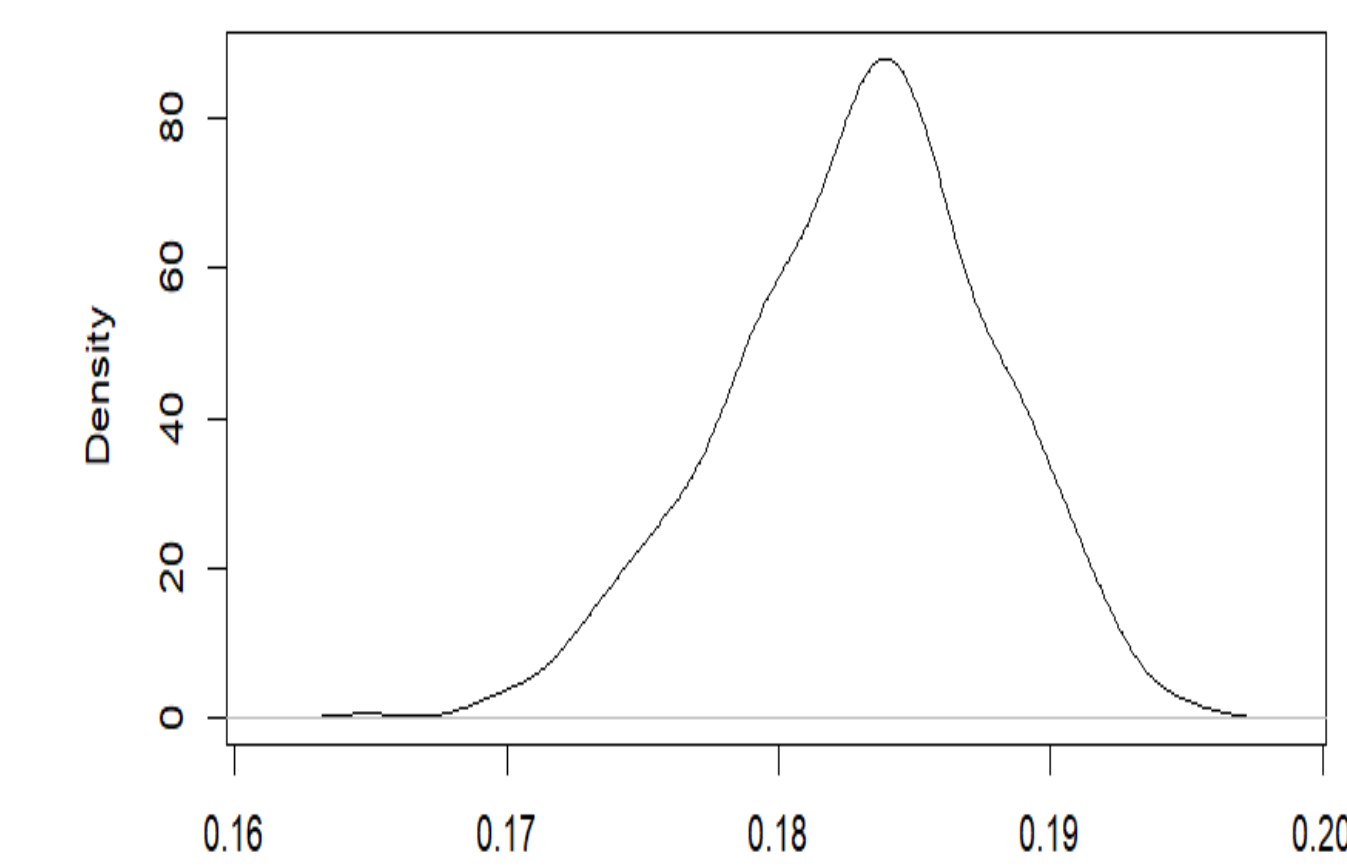


Figure 4. $\rho_{E_Score(t+1)}$

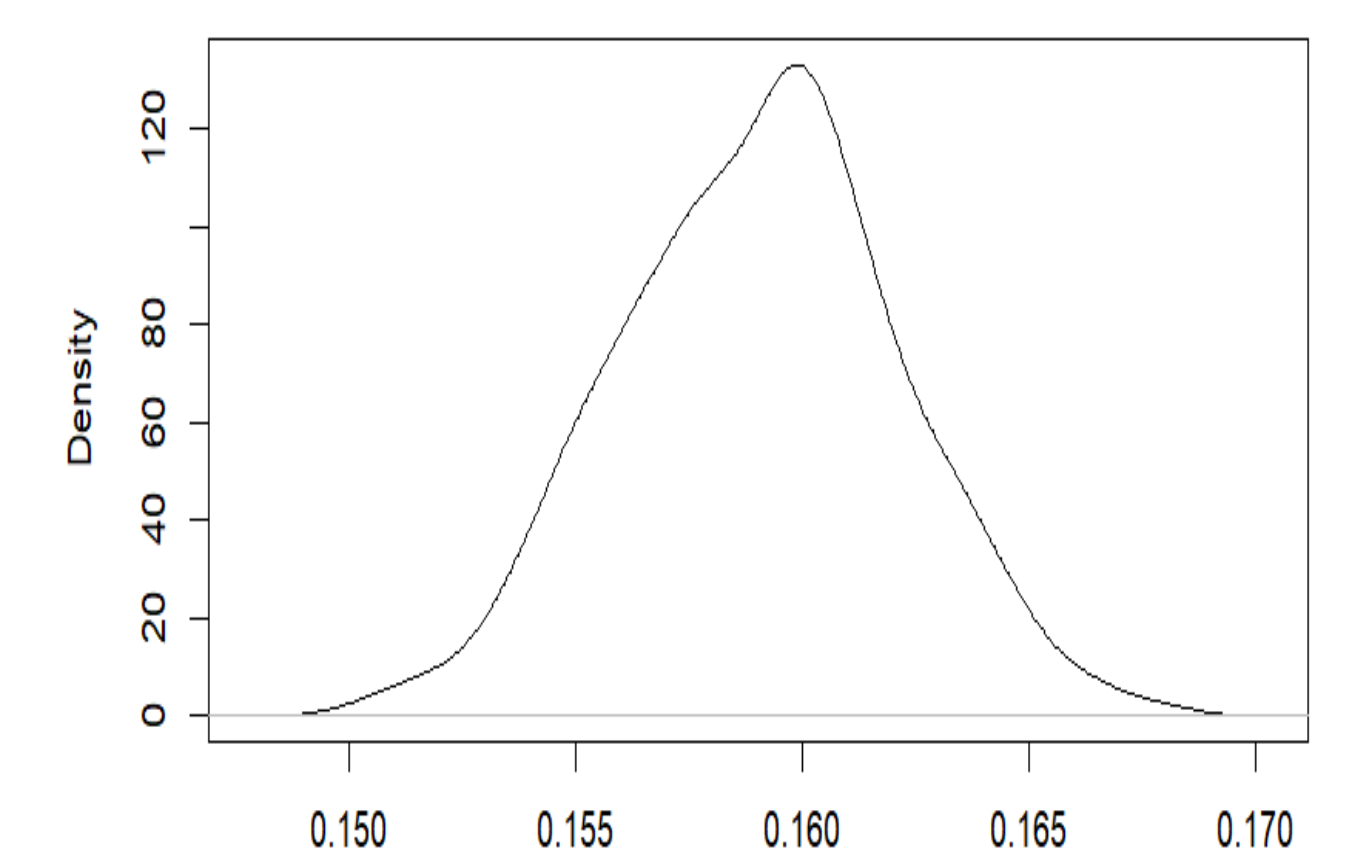


Figure 5. $\rho_{ESG_Score(t+1)}$

Key-Takeaways

- Distangled the signals** - Sustainable Debt on sustainable governance from sustainable governance on sustainable debt.
- Green debt issuances lead to the adoption of sustainable governance**, suggesting signaling to the existing debt holders about the progress.
- Mitigate the simultaneity bias using probabilistic instrument** following Rigobon (2003).
- Adoption of sustainable governance can help to achieve the environmental performance.**

Complete Paper

