Three Aspects of Green Bonds

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American Finance Association (AFA), 2022

Abstract

This paper examines three aspects of corporate green bonds – 'How do shareholders react to the announcement of green bonds issuance in different countries? 'Which firms issue green bonds?', and 'Who supports their issuance?' The stylized facts suggest that the issuance of green bonds is highly concentrated among few firms (and their subsidiaries) in the US and Europe but diversified in the Asian region. Upon analyzing the market reaction to the announcement of green bonds and alternate green bonds (-social bonds, sustainability bonds, and sustainability-linked bonds) in 19 countries, shareholders are either neutral to the issuance of green bonds or consider it to be greenwashing. I also determined that firms with low environment scores, low ESG scores, high unscaled carbon emissions, and no target emissions issue more green bonds than others. The latter result supports the signaling hypothesis. Additionally, only domestic (and not foreign) institutional investors support the issuance of green bonds, which implies the home-bias effect of domestic investors but the reluctance of foreign investors about this asset class. In summary, this paper suggests that it is crucial to understand the intricacies present in the issuance of corporate green bonds to correctly emulate the stockholders' reaction, to highlight the identity of green bond issuers, and to know what kind of institutional investors support the issuance of the green bonds.

Theories

- Signaling - Using green bonds, companies can signal their commitment towards the environment.
- Greenwashing - Firm can make false claims about the environmental commitments, provide selective disclosure, dubious eco-labels, misleading visual imagery, and misleading narratives.
- Cost of debt- Green bond investors are willing to accept lower yields for the greater good of fighting climate change, green bonds may represent a cheaper source of financing.

Related Literature

- Tang and Zhang (2020)
  - Positive market reaction to the issuance of green bonds.
  - No premium found.
  - Stock liquidity and domestic institutional ownership increases post-issuance.
- Flammer (2021)
  - Investors react positively to the announcement of green bond issuance, and the response is stronger for first-time issuers and bonds certified by third parties.
  - Issuers improve their environmental performance post-issuance (i.e., higher environmental ratings and lower CO2 emissions), and experience an increase in ownership by long-term and green investors.

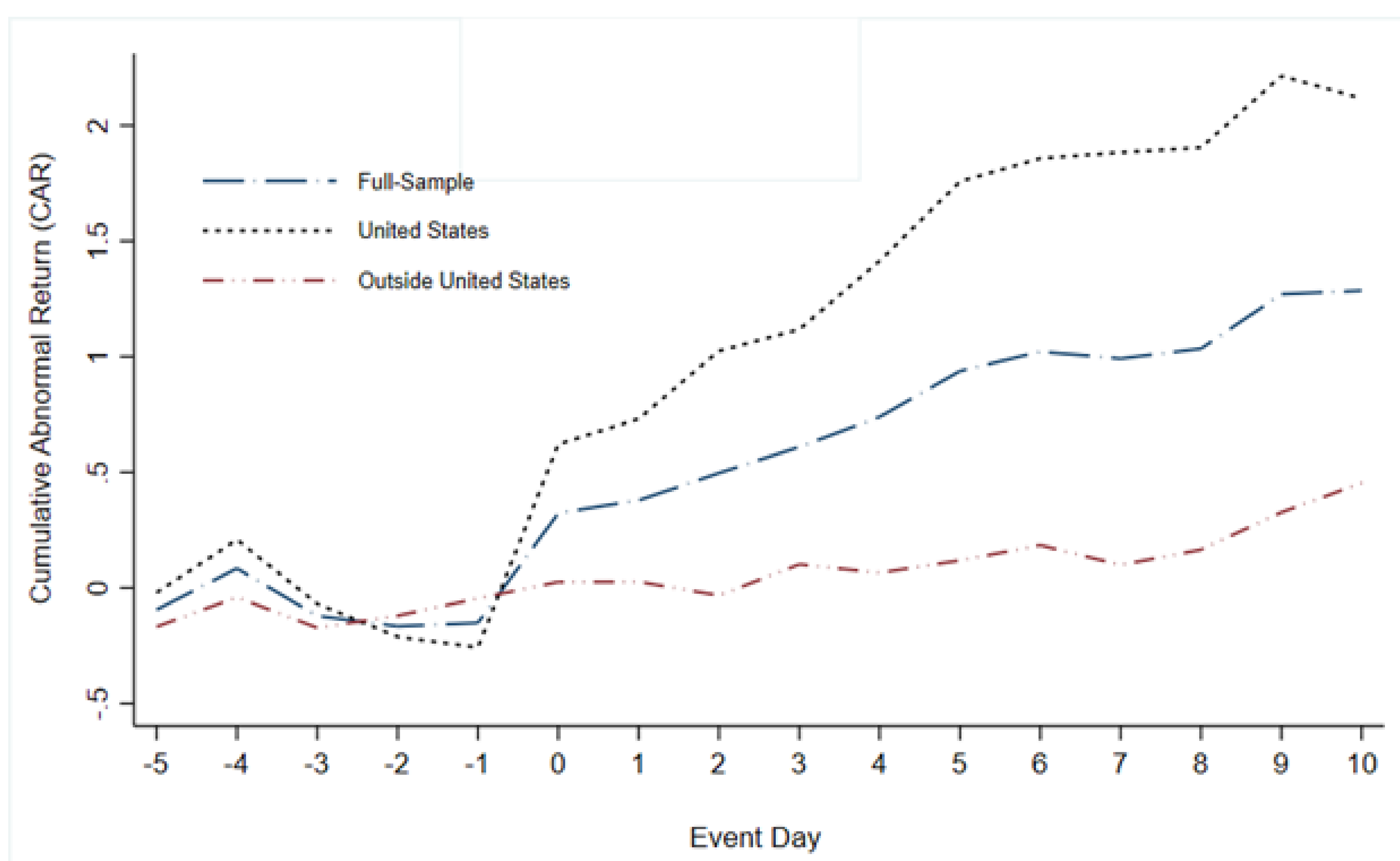
Data

- Bloomberg fixed income database - 3,486 Green bonds from 1st January 2013 to 31st December 2018.
- Excluding bonds by supranational, government, and similar other agencies - 1,189 Green Bonds.
- The firm characteristics and environment related variables are collected from Worldscope and Asset4 databases.
- The institutional ownership data is from the Factset Ownership database.

Bond Level Summary

	(1)	(2)	(3)
	All	Private	Public
# Green Bonds	1189	552	637
# Green bond issuer-days	729	343	386
# Green bond issuer-years	512	287	225
# Green bond issuers	393	224	169
Coupon (in %)	3.317	3.293	3.339
	(2.376)	(2.481)	(2.281)
Amount Issued (in million USD)	247	243	252
	(422)	(312)	(499)
Maturity (in years)	7.979	7.99	7.969
	(29.542)	(6.743)	(39.927)
Certified (in %)	68	76	62
Rating	AA-	AA-	AA-

Shareholders Reaction to Green Bonds



Matching and Difference-in-Difference Empirical Design

- Matching green bonds with non-green bonds based on country, industry, year, and firm fundamentals.
- Difference-in-Difference regression:

$$Y_{firm,Year} = \alpha_{firm} + \alpha_{Country}\ x\ \alpha_{Year} + \alpha_{Industry}\ x\ \alpha_{Year} + \beta\ GreenBond_{firm,Ye}$$

- The dependent variable (Y) is environmental score, ESG score, log of carbon emissions, target emissions, total institutional holding, and domestic institutional holding.

Who Issues Green Bonds ?

VARIABLES	(1) Environmental Score	(2) ESG Score	(3) Log Emissions	(4) Target Emissions
Green Bond	-1.012*	-0.523***	0.024**	-0.002***
	(0.466)	(0.076)	(0.010)	(0.000)
Constant	56.540***	56.503***	11.586***	0.328***
	(0.162)	(0.026)	(0.003)	(0.000)
Observations	1,068	1,068	659	1,068
R-squared	0.997	0.998	1	0.988
Firm	Yes	Yes	Yes	Yes
Country-Year	Yes	Yes	Yes	Yes
Industry-Year	Yes	Yes	Yes	Yes
Cluster(Industry)	Yes	Yes	Yes	Yes

Who supports green bonds issuance ?

Variables	Inst.Inv. Holding	Inst. Hold. Domestic
Green Bond	0.003**	0.007*
	(0.001)	(0.003)
Constant	0.389***	0.237***
	(0.001)	(0.001)
Observations	842	842
R-squared	1	1
Firm	Yes	Yes
Country-Year	Yes	Yes
Industry-Year	Yes	Yes
Cluster(Industry)	Yes	Yes

Conclusion

- Firms using green bonds as a tool to signal future commitment towards environment performance.
- Based on 2013-2018 sample, the market reaction to US green bonds is positive and significant but it is not true for outside US green bonds.
- Only domestic institutional investors support this asset class (home-bias effect) and not foreign institutional investors (asymmetric information).