

Can unconventional monetary policy contribute to climate action?

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The ECB is leading the way in greening its monetary policy

- ▶ Scaling up green finance is necessary to reach climate targets
- ▶ As monetary policy normalizes, even more crucial that investment towards the transition doesn't slow down with the rest of the economy
- ▶ Some central banks are willing to contribute
- ▶ The ECB announced on July 8th, 2021 that it plans to incorporate some climate criteria into its policy framework
 - ▶ Unexpected that climate would be so central in an announcement directly related to the conduct of monetary policy

Motivation

- ▶ This shift has some important potential catalytic effects, as the ECB is a large, anchor investor
- ▶ We focus on the corporate bond purchase programme of the ECB (CSPP):
 - ▶ Targets investment-grade corporate bonds issued by non-credit corporations incorporated in the eurozone
 - ▶ Its creation has been shown to have important impact
 - ▶ on bond yields, for both conventional and green bonds (Bremus et al., 2020)
 - ▶ on bond issuance (Todorov, 2019)
 - ▶ Its current implementation ("Market neutral") leads the portfolio to be tilted towards brown firms, as more polluting sectors rely more on bond financing

Hypotheses and data

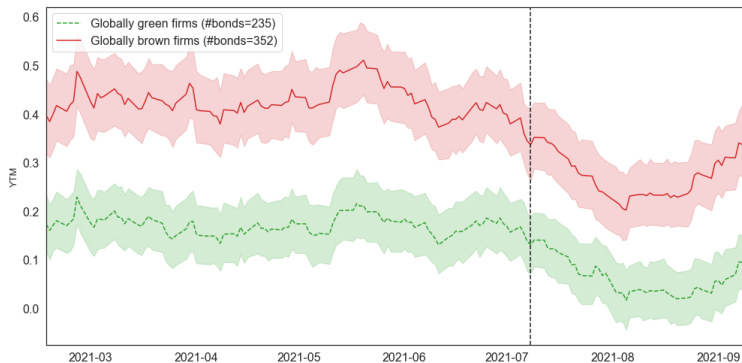
1. Bond price reaction to the announcement:
 - ▶ On conventional bonds, depending on the "greenness" of the issuer
 - ▶ On green bonds, which are bonds with proceeds earmarked for projects with environmental benefits ▶ What type of firms issue green bonds?
 2. Adoption of "green finance":
 - ▶ Test whether the announcement led to an increase in issuance of green bonds
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- ▶ Data are based on EuroStoxx600 firms, and from *Bloomberg Fixed Income*, *DataStream* (YTM), *Climate Bonds Initiative* (Green bond verification)
 - ▶ Summary statistics

1.(a) Conventional bonds' prices reaction the CSPP greening announcement

Study whether the announcement led to a increase in the cost of *conventional bond* financing for brown firms, compared to green firms:

$$\text{YTM}_{it} = \beta(\text{Brown firm} \cdot \text{Post})_{it} + \Gamma_w + \mu_i + \epsilon_{it},$$

where Γ_w are week FE, μ_i are bond FE.



Yield-to-maturity	
$Post \times Brown\ firm$	-0.048*** (-3.94)
# distinct bonds	587
Adj. R-squared	0.968
Bond FE	Yes
Week FE	Yes
Country x Month FE	No
Sector x Month FE	No

* p<0.10, ** p<0.05, *** p<0.01

Note: T-statistics are in parentheses.

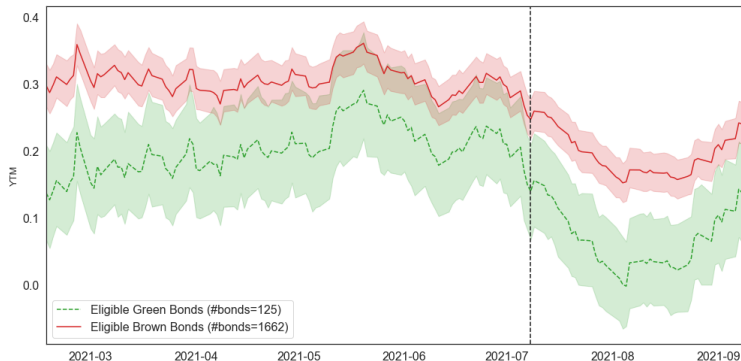
Standard errors are clustered at the bond level.

1.(b) Green bonds' prices reaction the CSPP greening announcement

Study whether the announcement led to a decrease in the cost of *green bond* financing, by comparing eligible *green* and *conventional* bonds:

$$\text{YTM}_{it} = \beta(\text{Green bond} \cdot \text{Post})_{it} + \Gamma_w + \mu_i + \epsilon_{it},$$

where Γ_w are week FE, μ_i are bond FE.



Yield-to-maturity	
<i>Post</i> × <i>Green bond</i>	-0.043*** (-5.35)
# distinct bonds	1787
Adj. R-squared	0.971
Bond FE	Yes
Week FE	Yes
Country × Month FE	No
Sector × Month FE	No

* p<0.10, ** p<0.05, *** p<0.01

Note: T-statistics are in parentheses.

Standard errors are clustered at the bond level.

2. Effect on the adoption of "green finance" in the eurozone

- ▶ Study whether lower Yield-to-Maturities for corporate green bonds led to higher incentives for green bond issuers to increase issuance
- ▶ Use issuer-level weekly cumulative amount of green bonds issued (in USD billions):

$$y_{ft} = \beta_1(\text{Treat} \cdot \text{Post})_{ft} + \beta_2 t + X'_{ft}\eta + \Gamma_w + \nu_f + \gamma_c + \epsilon_{ft},$$

where X_{ft} are time-varying firm characteristics, ν_f firm FE, and γ_c country FE.

- ▶ Treatment group: firms incorporated in the eurozone, while our control group are firms incorporated in Europe but not in the eurozone

2. Effect on the adoption of "green finance" in the eurozone

	All green bonds		Investment-grade		Non-investment-grade		Green bonds with a review	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Post × Treated</i>	0.419*** (3.95)	0.154** (2.40)	0.383*** (3.78)	0.164** (2.14)	0.111* (1.73)	0.063 (1.37)	0.189*** (3.02)	0.012 (0.23)
<i>Time trend</i>	0.029*** (6.38)	0.012*** (4.76)	0.024*** (5.70)	0.010*** (4.14)	0.004** (2.24)	0.001 (0.83)	0.023*** (5.76)	0.012*** (5.88)
<i>Carbon Price</i>	0.003 (1.48)	0.001 (0.57)	0.001 (0.36)	-0.001 (-0.55)	0.002** (2.26)	0.002** (2.02)	-0.004** (-2.39)	-0.005*** (-3.59)
<i>Lagged Carbon Price</i>	-0.000 (-0.05)	0.001 (0.19)	0.001 (0.54)	0.002 (0.71)	-0.002 (-1.33)	-0.002 (-1.26)	-0.002 (-1.05)	-0.001 (-0.74)
<i>Quarterly Firm Leverage</i>	0.079* (1.72)	0.041 (1.12)	0.072 (1.55)	0.040 (1.07)	0.003 (0.27)	-0.003 (-0.25)	0.105** (2.37)	0.080** (2.05)
<i>Lagged Amount Issued</i>		0.669*** (13.11)		0.552*** (5.30)		0.121 (1.59)		0.446*** (5.84)
Observations (Issuer-Week)	14567	14567	14567	14567	14567	14567	14567	14567
Adj. R-squared	0.929	0.960	0.936	0.959	0.595	0.617	0.933	0.957

Note: Issuer, week, country-month and sector-month fixed effects are included. T-statistics are in parentheses. Significance levels are indicated by * < .1, ** < .05, *** < .01. Standard errors are clustered at the issuer level.

Summary

- ▶ The announcement had some important effect on the market:
 - ▶ YTMs of eligible green bonds decreased compared to eligible conventional bonds
 - ▶ Firms incorporated in the eurozone increased more strongly their green bond issuance after the announcement
- ▶ Those results are encouraging for central banks greening their monetary policy
- ▶ However, some solid frameworks will be needed to boost *high-quality* green bonds

Appendix (1): Bond-level descriptive statistics

	Mean	Sd	Minimum	p5	Median	p95	Maximum
Yield-to-Maturity	0.18	0.39	-0.47	-0.38	0.08	0.91	1.29
Time to Maturity (in years)	7.07	4.08	1.13	1.49	6.49	15.49	20.26
Coupon	0.95	0.73	0.00	0.01	0.88	2.50	3.05
Amount Issued (in USD billions)	0.78	0.33	0.05	0.33	0.72	1.44	1.93

Table: Green bonds

	Mean	Sd	Minimum	p5	Median	p95	Maximum
Yield-to-Maturity	0.28	0.62	-0.70	-0.41	0.17	1.28	7.44
Time to Maturity (in years)	6.01	4.27	1.02	1.34	5.07	13.96	30.66
Coupon	1.38	1.20	0.00	0.00	1.11	3.95	8.13
Amount Issued (in USD billions)	0.65	0.67	0.00	0.00	0.57	1.70	6.52

Table: Conventional bonds

Appendix (2): Who are the green bond issuers?

- ▶ Green bonds are “Use-of-proceeds” bonds, with proceeds earmarked for projects with environmental benefits
- ▶ Important tool of the transition financing: signal issuer's commitment towards energy transition and leads to reduction in carbon emissions (Flammer, 2021)
- ▶ Corporate green bond market dominated by: (i) financial firms, (ii) utility firms, in particular carbon-intensive ones

