

The Green Transition and Bank Financing

- Climate change is threatening the future of the globe
- Extreme weather conditions attracted policymakers' interest and urged the need for action
- The Paris Agreement** (2016) aims to limit the increase in average global temperatures within 1.5°C to those prevailing before the Industrial Revolution
- OECD estimates that "\$6.9 trillion a year is required up to 2030 to meet climate and development objectives"
- This transition to a carbon-neutral economy requires environmental consciousness of firms and banks
- How bank financing can contribute to reaching these global climate objectives?

In this paper,

- We investigate whether and how *environmental consciousness* (greenness for short) of firms and banks is reflected in the pricing of bank (syndicated) credit
- Finding: green firms enjoy cheaper loans—however, only when borrowing from green banks, and primarily after the Paris Agreement (after 2015)
- Thus, we find that environmental attitudes matter when “*green meets green*”
- Develop a stylized theoretical model to show that the green-meets-green effect emerges in equilibrium as the result of the third-degree price discrimination with regard to firms' greenness when public awareness of climate transition risk is sufficiently high

Data and Proxies for Green Banks and Firms

- Carbon Disclosure Project (CDP)**
 - e.g., Kleimeier and Viehs, 2018; Ben-David et al., 2020
 - Data on ≈ 6000 firms CO2 carbon emissions at the country of incorporation and in each country where a firm has operations
 - Provides info on firms declining to participate or not answering the questionnaire
 - Firm is classified as “Green” if it discloses info to CDP
- United Nations Environment Programme Finance Initiative**
 - e.g., Fatica et al., 2019; Delis et al., 2020
 - “Partnership between UNEP and the global financial sector to mobilize private sector finance for sustainable development”
 - UN Principles for Responsible Banking*: aims to “transform the banking industry to enable it to play a leading role in achieving [goals of] the **Paris Climate Agreement**”
 - About 160 members (leading banks)
 - Bank is classified as “Green” if it is a member of UNEPFI
- LPC DealScan**: All-in-Spread-Drawn (in bps) and loan-level controls
- Compustat Global and North-America, Orbis Global and Bank Focus**: firm- and lender-level controls

Green Meets Green and Loan Spreads

$$AISD_{i,b,t} = \beta_0 + FE_{t,i,b} + \beta_1 FGreen_{i,t-1} + \beta_2 BGreen_{b,t} + \beta_3 FGreen_{i,t-1} \times BGreen_{b,t} + \gamma' X_{i,b,t-1} + \epsilon_{i,b,t}$$

- $AISD_{i,b,t}$ is the all-in-spread-drawn of loan facility i , issued by the syndicate's lead arranger(s) b in year t
- $BGreen$ is the *fraction* of UNEP FI members among the lead arrangers in the loan syndicate
- $FGreen_{i,t-1}$ is 1 if firm i discloses info to CDP in year $t - 1$, and 0 otherwise
- $FGreen_{i,t-1} \times BGreen_{b,t}$ captures the GMG effect: β_3 is a discount (when negative) a green firm obtains when borrowing from a green bank

Result 1: Green Meets Green and Loan Spreads

	All-in-Spread-Drawn			
	(facility-level data)		(lead arranger-level data)	
	(1)	(2)	(3)	(4)
FGreen	5.084 (4.386)	-	1.659 (3.763)	-
BGreen	40.826*** (6.925)	47.880*** (13.168)	16.730* (9.816)	58.914*** (9.871)
FGreen x BGreen	-17.788 (12.033)	-33.911 (29.310)	-9.829 (9.260)	-17.274 (23.382)
Loan characteristics	Yes	Yes	Yes	Yes
Borrower characteristics	Yes	-	Yes	-
Lender characteristics	Yes	Yes	-	-
Year fixed effects	Yes	-	-	-
Borrower country fixed effects	Yes	-	Yes	-
Borrower x time fixed effects	No	Yes	No	Yes
Lender x time fixed effects			Yes	Yes
Adj. R ²	.5659	.7355	.6740	.8788
Observations	9,117	17,012	26,906	68,305

The Green Meets Green Effect and the Paris Agreement

- Theoretically, the GMG effect, and thus climate risk-based price discrimination, should really arise when public awareness of climate transition risk is sufficiently high
- Conjecture: the Paris Agreement, as the world's first comprehensive climate agreement, raised public awareness of climate-related risks and increased the soft commitment of policy-makers to a stricter enforcement of climate policy
- Split the sample into before and after the Paris Agreement: loans with the origination date preceding December 12, 2015 are “Before Paris” and all other loans are “After Paris”

Result 2: Green Meets Green with Paris Sample Split

	All-in-Spread-Drawn							
	(facility-level data)				(lead arranger-level data)			
	(1) Before Paris	(2) After Paris	(3) Before Paris	(4) After Paris	(5) Before Paris	(6) After Paris	(7) Before Paris	(8) After Paris
FGreen	1.431 (5.663)	11.637* (6.395)	-	-	-9.852 (8.359)	8.092 (7.159)	-	-
BGreen	40.190*** (7.942)	36.155*** (12.432)	62.578*** (17.146)	8.874 (19.860)	18.169* (10.273)	30.656*** (11.863)	68.698*** (13.250)	51.218*** (14.187)
FGreen x BGreen	5.576 (18.108)	-49.702*** (14.201)	2.496 (36.863)	-69.760* (37.595)	19.464 (19.259)	-61.611*** (18.069)	8.912 (31.607)	-58.086** (26.984)
Loan characteristics	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Borrower characteristics	Yes	Yes	-	-	Yes	Yes	-	-
Lender characteristics	Yes	Yes	Yes	Yes	-	-	-	-
Year fixed effects	Yes	Yes	-	-	-	-	-	-
Borrower country fixed effects	Yes	Yes	-	-	Yes	Yes	-	-
Borrower x time fixed effects	No	No	Yes	Yes	No	No	Yes	Yes
Lender x time fixed effects					Yes	Yes	Yes	Yes
Adj. R ²	.5867	.5630	.7323	.7411	.6955	.6990	.8920	.8604
Observations	5,524	3,584	9,606	7,394	17,076	9,797	39,827	28,443

Additional (Robustness) Tests

- Matching Estimator**: Condition treatment (GMG) on loan, firm and lender observables in order to find statistical twins. Compute the mean AISD difference between green loans to green firms and loans to non-green firms that are matched using the (i) mahalanobis distance and (ii) propensity score.
- Oster-test for Omitted Variable Bias**: Assess coefficient-sensitivity to unobservable omitted variables
- Heckamn Selection Model**: Sample selection bias caused by participation in (i) the CDP survey and (ii) UNEPFI alliance
IMR: statistically insignificant, so main analysis robust to sample selection bias
- IV Approach** to account for Reverse Causality: identification of green-meets-green after the Paris Climate Accord could be biased due to endogenous matching between the firm and a green bank
Instrumental variables: pre-Paris green lender choice for post-Paris green lender choice
- Financial Borrowers**: no green-meets-green discount, either before or after the Paris Accord
- Falsification test of Paris climate Agreement**: no evidence of a green-meets-green effect during 2011-2015

Conclusion: Environmental attitudes matter when “Green Meets Green”

- Employing data on syndicated loans over the period 2011-2019, we find that firms showing environmental consciousness (i.e., green firms) enjoy more favorable terms of about 50bps compared to brown firms when borrowing from a green bank
- This green-meets-green effect is observed after the Paris Agreement consistent with the impact of increased awareness of the importance of climate transition risks
- This finding is consistent with our theoretical model in which green banks have incentives to pursue third-degree price discrimination between green firms and other firms when public awareness of climate transition risk is sufficiently high