Primary Corporate Bond Markets and Social Responsibility

Michael Halling  
University of Luxembourg

Jin Yu  
Monash University

Josef Zechner  
WU Vienna

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Motivation

- Two important and interrelated questions in Sustainable Finance:
  - What are the implications of ESG for financial returns?
  - Do financial markets have an impact on the ESG characteristics of firms?
- Why study primary corporate bond markets?
  - Bonds allow us to get a more direct estimate of the cost of capital that investors charge (compared to equity markets where expected returns are unobservable).
  - Primary markets provide attractive features being intermediated and less exposed to market frictions (e.g., liquidity).
  - Given that the cost-of-debt is observable and that bond issuers tend to issue bonds repeatedly, we can evaluate firm-level responses (in terms of ESG characteristics) to investors’ preferences for sustainability.
Overview of results

- Firms with better ES-scores pay, on average, lower credit spreads than firms with poorer ES-scores.
- ES-scores contain information about the credit risk of the firms (risk-based channel).
- No pronounced time-series patterns in spreads consistent with observed shift in investor preferences. But, the supply of G-bonds has increased over time (potentially attenuating the effects on spreads).
- Additional results:
  - Important ES-dimensions across the full sample are product-related and employee-related scores.
  - The ENV-score only matters in selected industries (e.g., mining).
  - ES-scores only matter for HY bonds and BBB-rated bonds.
- These empirical results are largely consistent with the predictions from our theory.
Related literature (overview)

- ESG and bond markets, in particular:
  - Seltzer et al. (2020): focus on cross-state variation in environmental regulatory risk in combination with presumably exogenous, climate-risk related events.
  - Amiraslani et al. (2019): focus on secondary markets and corporate social capital which only seems to matter during crises (i.e., the GFC).
  - We study E&S comprehensively, exploit cross-sectional heterogeneity, explicitly assess implications for credit risk and also assess supply-side effects theoretically as well as empirically.

- ESG and credit ratings: Yang (2020) exploits that Moody’s and S&P announced taking ESG information into account two years earlier than Fitch.

- Baker et al. (2018) study the pricing of U.S. green bonds — mostly issued by municipalities — and find that they are issued at lower spreads.


- ESG and equity markets: a large literature (see a recent survey paper by Matos (2020)).
A simple model of ES-performance and bond spreads in primary markets (Heinkel et al. (2001))

- Two types of bonds: G-bonds (P-bonds) are issued by firms with good (poor) ES-ratings.
- Two types of investors: Green (neutral) investors only buy G-bonds (buy both bonds).
- Firms can make a costly ES investment and switch from a polluting technology to a green technology. Investment costs are heterogeneous across firms. I.e., bond supply is endogenous.
- The model distinguishes three channels for ES to affect bond spreads:
  - Channels 1 & 2 are related to credit risk (i.e., expected default losses and riskiness of bond payoffs).
  - Channel 3 captures the demand effect that results in limited risk sharing for P-bonds.
- Difference in bond prices is determined by those three channels and, in equilibrium, equal to the marginal firm’s ES investment costs:

\[
P_G - P_P = K^c = \delta + \frac{1}{\tau l} \left( N_P \sigma_P^2 - N_G \sigma_G^2 + (N_G - N_P) \sigma_{GP} + N_P \frac{I_g}{I_n} \sigma_P^2 \left( 1 - \rho_{GP}^2 \right) \right)
\]  
(1)
Model implications for empirical work

- G-bonds should have lower spreads than P-bonds.
  - To disentangle the mechanisms: (a) study the relation between ES-scores and credit risk, and (b) exploit time-series dynamics of the effects (model implies that spread differences widen when fraction of green investors increases).
  - However: endogenous G-bond supply attenuates, for example, the impact of an increase in investor preferences for green investments on bond spreads.

- Bond price differences increase with the variances of bond cash flows, $\sigma^2_G$ and $\sigma^2_P \rightarrow$ effects should be smaller for bonds with high ratings.

- Spread differences are more negative in industries and/or for ES-dimensions for which investment costs in ES are higher.
  - For example: mining firms and the ENV-score.
Data, sample, and empirical methodology

- **Multivariate framework — panel regression:**

\[
Spread_{i,t+1} = \alpha + X_{i,t} \beta + \gamma ES_{i,t} + u_i + \nu_{t+1} + e_{i,t+1}
\]

where bond issues are indexed by \( i \) and years by \( t \).

- **Spread**: yield spread of new bond issues from Mergent FISD.
- **ES**: ES-scores (We ignore the G-dimension) from MSCI ESG KLD:
  - Environment and five S scores: Community, Diversity, Employee Relations, Product, and Human Rights.
  - Scores are normalized between -1 (worst) and +1 (best) using the full ESG sample (following the literature).
- **X**: bond ratings at issuance (Mergent FISD) and issuer balance sheet variables (Compustat).
- **u** and **v**: industry and year fixed effects.
- **Sample period**: 2002 – 2020: covers two crisis periods (GFC and COVID19).
What are potential implications of observing an insignificant $\gamma$?

Recall that

$$P_G - P_P = K^c = \delta + \frac{1}{\tau l} \left( N_P \sigma_P^2 - N_G \sigma_G^2 + (N_G - N_P) \sigma_{GP} + N_P \frac{I_g}{I_n} \sigma_P^2 \left(1 - \rho_{GP}^2 \right) \right)$$

▶ A specific ES-score is irrelevant for the risk profile and investors do not care about it.
▶ G-bonds and P-bonds are close substitutes (irrelevance with respect to risk characteristics). Even though investors might care about the ES-score, the risk sharing argument does not bind (see, Berk and van Binsbergen, 2021).
▶ Adjustment costs with respect to this ES-score are small. Most firms are “green” with respect to that dimension.

$\implies$ Heterogeneity of effects across industries, rating classes and ES-scores.
ESG and credit spreads: full sample evidence

Good ES-performance is related to a significant reduction in spreads:
- An issuer with the best possible ES-score in a given year enjoys a 19 bps reduction in spreads.
- The 19 bps represent a modest effect in economic terms but reflect an average effect.

Product score (pro_score) is the main driver followed by the employee-relation score and the diversity score.

Firm characteristics, rating dummies as well as industry and year FE's are included in all specifications (coefficients are not reported here but make intuitive sense).

Explanatory power of the model above 60%.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) ES score All Years Spread</th>
<th>(2) Individual scores All Years Spread</th>
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<tr>
<td>env_score</td>
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<td>Industry and Year FE's</td>
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<td>R-squared adjusted</td>
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</table>
Have the effects of ES scores on spreads increased (in absolute terms) over time?

Consistently negative point estimate using a 5-year rolling window but no pronounced time-series patterns.

Supply of bonds with positive ES-scores, however, has increased from 40% to 80%.
Underlying mechanisms: credit risk vs. investor preference

- **Investor preference channel**: despite of the increasing awareness of ES objectives among investors, the effects of ES scores do not exhibit strong downward-sloping time trends, as predicted by the theory.
  - However, effect might be attenuated through an increase in supply of G-bonds, as we find empirically.
- **Risk channel**:
  - Following the bonds in our issuance sample over a three-year horizon, we document that aggregate and individual ES scores tend to reduce the occurrence of default.
  - We also find that ES scores decrease the probability of credit rating downgrades — in the case of HY bonds.
We find that ES-scores contain relevant information for corporate bond spreads: firms with high ES-scores tend to issue bonds at lower spreads compared to similar bonds with low ES-scores.

ES-scores matter in default and downgrade prediction models.

ES-scores are more relevant for lower ratings that are more exposed to credit risk.

We find a strong increase in the supply of G-Bonds that would be consistent with the observed shift in investor preferences in recent years.