

Financial Market Structure for ESG Integration

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- The capital market for ESG has been rapidly growing recently.
 - The global ESG market size is about \$30 trillion (*Bloomberg*, 29 Nov 2023).
 - New regulations also boosted the ESG market growth.
 - The EU taxonomy, new accounting standards for climate risks, ...

- But, there is a mounting concern with borrowers' commitment to ESG integration.
 - Outside investors are incapable of monitoring borrowers' follow-through on ESG.
 - No consensus on the clear definition of ESG;
 - Limited information about firms' actual actions to comply with ESG;
 - ⇒ No standard to evaluate corporate borrowers' ESG performance yet.
 - These poor capabilities of ESG monitoring are often attributed to "greenwashing."
 - Corporate borrowers, for their private benefits, misuse funds earmarked for ESG.

- Which competition structures in the capital market can address greenwashing problems?
 - We provide theoretical analysis to answer this question.

Q1. Does a more competitive lending market facilitate ESG integration? **No.**

- A high financial cost of borrowing is necessary to address greenwashing;
- But, non-ESG lenders competitively lower equilibrium borrowing rates.

Q2. Does fairer lender competition always facilitate ESG integration? **No.**

- Incumbent pro-ESG lenders can bid for lending earlier than their competitors.
- These lenders can “cleanse” the ESG capital market.
 - Non-ESG borrowers get funds from early lenders and leave the market early;
 - Thus, the holdout borrowers are deemed as pro-ESG by late non-ESG lenders.

- The firm chooses one of two projects yielding different financial and social returns:
 - Green (low NPV, high ESG value) vs. Brown (high NPV, low ESG value).
 - Green project (G): financial return $R > 0$ with prob. p_G and social return $\phi > 0$;
 - ϕ is realized in the form of positive externality;
 - Brown project (B): financial return $R > 0$ with prob. $p_B > p_G$ but zero social return.
 - The firm is cashless, so it has to borrow to finance the unit investment cost.
- There are two types of lenders funding the firm's project:
 - Green lenders equally value financial payoffs and social return;
 - Brown lenders only focus on financial payoffs;
 - All lenders compete to fund the firm in Bertrand fashion.
- Assumptions:
 - (i) The firm values social return from its project with weight $\lambda > 0$;
 - (ii) The firm's project selection is not contractible:
 - The repayment D contingent on R is the only contractual term.

- The firm, after borrowing from a lender, chooses green project *iff*

$$p_G(R - D) + \lambda\phi > p_B(R - D) \implies D > \bar{D}(\lambda) := R - \lambda \frac{\phi}{p_B - p_G},$$

that is, the borrowing rate is sufficiently *high*!

- (*Risk-shifting*) the firm takes a higher financial risk to reduce the expected repayment.
 - The net expected repayment $(p_B - p_G)D$ increases with D ;
 - Instead, the firm gets a higher social return that cancels out the financial loss.
- Conjecture: competition among lenders may deter green investments.
 - Competition between lenders leads to a low D .
 - The firm strictly prefers a low D , too:

$$\max\{p_G(R - D) + \lambda\phi, p_B(R - D)\}.$$

- Equilibrium is pinned down by λ – the firm's innate preference for social value.
- Indeed, how brown lenders believe the firm's ex-post project selection is crucial.
- Specifically, $\exists \bar{\lambda}^*$ s.t. the firm chooses green project *iff* $\lambda > \bar{\lambda}^*$.

1. If $\lambda > \bar{\lambda}^*$ ($\iff \bar{D}(\lambda) < \frac{1}{\rho_B}$):

- (Brown) lenders expect the firm will choose the green project;
- Due to low NPV, brown lenders must charge a high borrowing rate $D^* = \frac{1}{\rho_G}$;
- Such a high borrowing rate incentivizes green investment.

2. If $\lambda \leq \bar{\lambda}^*$ ($\iff \bar{D}(\lambda) \geq \frac{1}{\rho_B}$):

- (Brown) lenders expect the firm will choose the brown project;
- Therefore, brown lenders charge a low borrowing rate $D^* = \frac{1}{\rho_B} (< \frac{1}{\rho_G})$;
- Green lenders cannot make a counter-offer, which only induces brown investment.

- However, $\bar{\lambda}^*$ decreases when there are only green lenders ($\bar{D}(\lambda) < \frac{1}{\rho_G}$).
 - Suppose an equilibrium where green investment is induced ($D^* = \frac{1}{\rho_G}$);
 - Any green lender enjoys social return $\phi > 0$ although she does not lend directly;
 - But, no lender may deviate by offering a $D' < D^*$ that yields brown investment;
 - She must attach a “dirty” premium to D' for the net social loss $-\phi$;
 - Deviation may be infeasible due to the social losses from dirty investments.
 - Even a low λ supports green investment due to a relatively high borrowing rate.
- ⇒ Brown lenders' participation in the ESG capital market may not be socially desirable.
- Brown lenders do not charge any dirty premium for funding brown investments.
 - The firm can enjoy cheap financing despite brown investments.

- We next assume that the firm privately knows λ , its innate preference for social value.
 - It is difficult to assess how heavily the borrowing firm considers long-term social value.
- Specifically, we assume $\lambda \in \{\lambda_B, \lambda_G\}$ with a prior belief $Pr(\lambda = \lambda_G) = q$ s.t.

$$\lambda_G > \bar{\lambda}^* > \lambda_B.$$

Throughout, we call the firm is “green” (“brown”) type if $\lambda = \lambda_G$ ($\lambda = \lambda_B$), respectively.

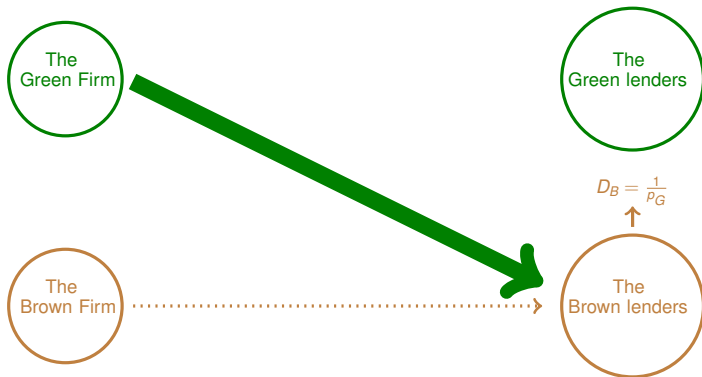
- We focus on the case where q is sufficiently small.
- Q. Which of the market structures can induce the brown firm to choose the green project?
- Green investments are achieved if at least one green lender bids ahead of the others.
 - The first-moving green lenders can “cleanse” the ESG capital market!
 - Rejecting the early lending bid signals the firm’s strong ESG preference.

Extension: Green Investments under Adverse Selection



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The green firm is a likely borrower **in the later capital market**.



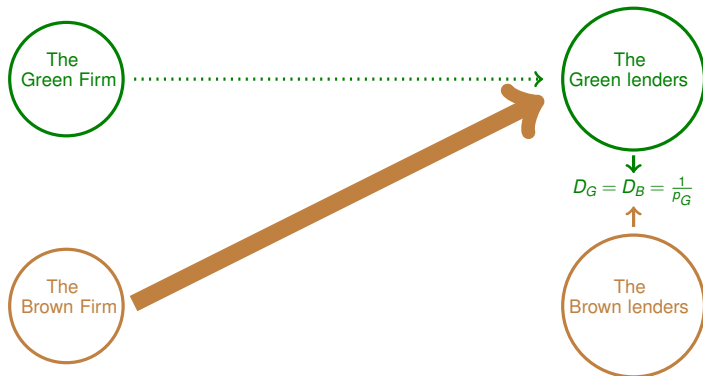
Extension: Green Investments under Adverse Selection

The green lenders then offer $\frac{1}{p_G}$ in the early market, too.



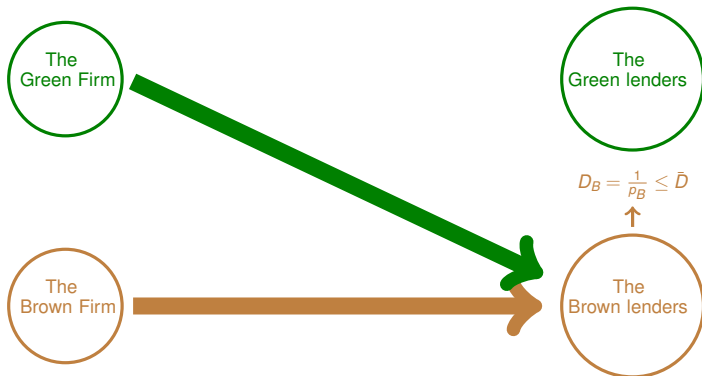
Extension: Green Investments under Adverse Selection

The brown firm finds it (weakly) optimal to accept $\frac{1}{\rho_G}$ and choose **the green project**.



Extension: Green Investments under Adverse Selection

However, the brown lenders, if bidding first, will lower the borrowing rate, resulting in brown investments.



■ Policy implications:

- i.* Regulators may have to grant access to ESG markets only to lenders verified as “green.”
e.g. SEC’s “naming rule.”
- ii.* Established ESG lenders may need to maintain their incumbency advantage.
 - Corporate borrowers can utilize existing relationships to fund new ESG projects.
e.g. A majority of PE funds in Europe are shifting towards the “ESG or nothing” strategy.
- iii.* Green lenders’ funding of “brown” firms may not be an outcome of greenwashing.
 - Instead, such lending practice may be an act of “cleansing” the ESG capital markets.

- We characterize market conditions that facilitate ESG integration.
 - We focus on the cases where corporate borrowers cannot commit to ESG integration.
- Competition among lenders in ESG markets may not be desirable!
 - Borrowers want to make green investments only if the borrowing rate is high.
 - But, lenders pursuing financial profits competitively bid, lowering the borrowing rate.
 - Restricting “brown” lenders to ESG markets can facilitate ESG integration.
- When facing adverse selection, green lenders, if bidding first, can “cleanse” ESG markets.
 - By doing so, the remaining borrowers are likely deemed as “green.”
 - Granting competitive advantage to lenders verified as “green” may be optimal.