Financial Constraints and Emission Intensity

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Research Question
How do high emitting firms adjust to tighter financial constraints? And what happens to their emission intensity when they adjust?

Winner-Picking in Dirty Firms
- Headquarters can reallocate scarce resources within the firm to fund relatively more profitable projects (Stein, 1997) → Winner Picking
- When dirty subsidiaries are more profitable: ↑ Emission intensity
- Are dirty subsidiaries more profitable?

An alternative mechanism: Constraint-Minimization
- High emitting firms can face tighter financial constraints due to their dirty status: a carbon premium in equity markets (Bolton and Kacperczyk, 2021) and higher loan (Delis et al., 2021) and bond prices (Seltzer et al., 2022)
- When the constraints are a consequence of firms’ dirty status, firms can divert funding to cleaner projects to improve access to funding:

2nd Natural Experiment: Banks’ SBTi commitments
- A shock to firms credit constraints related to firms’ environmental performance
- Between 2015 and 2019, 12 banks join the Science Based Carbon Initiative (SBTi) and pledge to a target of portfolio decarbonization
- This led to a reduction in credit supply to high-emitting borrowers of committed banks (Kacperczyk and Peydró, 2022)
- Staggered DiD approach following Sun and Abraham (2021):

Further Results: Constraint-Minimization
- Treated firms do not engage in winner-picking and do not shrink at the margin:
- Profitability
- Emission intensity is not affected, but firms cater to their lenders’ sustainable preferences: the relative decline in size is matched with a proportional reduction in emissions

Take-Aways
I argue that within-firm capital allocation matters for firms’ environmental performance when firms face a tightening in financial constraints:
1. I link the idea of winner-picking from the literature to an increase in emission intensity for dirty firms and show that this is the case using empirical evidence.
2. I propose the alternative mechanism of constraint-minimization which arises when the constraint is correlated with firms’ environmental performance and show that this incentive can prevail over winner-picking in an empirical setting.
3. In the paper, I also provide a simple theoretical framework to highlight the internal capital market decision of the firm and show the trade-offs between engaging in winner-picking and constraint-minimization.

Data
A sample of European firms active in emission-intensive sectors:
- Financial and Ownership: Bureau van Dijk Ownership Database
  - Historical parent-subsidiary links 2009-2019
  - Financial and descriptive characteristics at subsidiary and parent level
- Emissions: EU Emission Trading Scheme Data
  - Installation level emission data mapped to parents and subsidiaries
- Banking Relationships: AMADEUS Bankers

1st Natural Experiment: The EBA Capital Exercise
- A plausibly exogenous shock to credit constraints unrelated to firms’ social cost
- In 2011, 61 EU banks had to increase their Tier 1 capital ratios to 9%
- This led to a reduction in corporate lending (Gropp et al., 2018) and a credit crunch (Mésonnier and Monks, 2015) for borrowers of participating banks
- Differences-in-Differences approach where Treated are borrowers of EBA Banks

Do treated firms engage in winner-picking?

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- Treated firms do not engage in winner-picking and do not shrink at the margin:
- Profitability
- Emission intensity is not affected, but firms cater to their lenders’ sustainable preferences: the relative decline in size is matched with a proportional reduction in emissions
- Are treated firms engaging in constraint-minimization?

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References:
- Homburg, Jean-Sébastien and Stéphanie V. (2015), “Do the EBA capital requirements reduce the credit supply to green firms?”, International Journal of Central Banking

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