Financial Constraints and Emission Intensity

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Summary

- What is the role of loan supply for carbon emissions?
  → Accetturo et al.: Higher credit supply enables firms to pursue green investments.
  → Kacperczyk and Peydro: A decline in loan supply to dirty firms decreases their size, debt, and investment.
- **This paper**: an intuitive framework to understand how firms respond to a negative funding shock.
  → Two important parameters: cleanness of the marginal project and nature of the funding shock.
  → Within firm heterogeneity that uses EU ETS participation to distinguish dirty/clean subsidiaries (projects).
  → On average, dirty subs are more profitable, suggesting that green subs are easier to sacrifice. Thus, firms react to a negative credit supply shock by decreasing the size of their clean subs.
  → If banks adopt a cleaner lending policy, firms cut back on their dirty subs.

Winner-picking assumptions

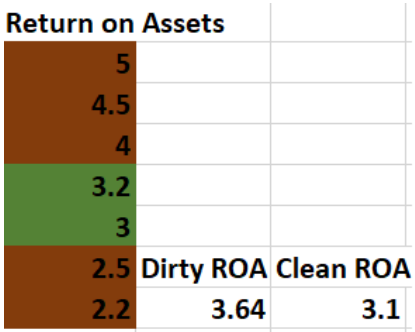
- Winner-picking: Firms react to a credit constraint by diverting funds to more profitable projects. If the green projects are less profitable, they will not get funding, increasing emission intensity.
  $\rightarrow$ To justify empirical findings, it is important to show that green projects are less profitable.

	(1) ROA	(2) Ln Total Assets
Dirty Subs	0.012*	0.886***
	(0.006)	(0.102)
Observations	3166	3166
Parent-Year FE	Yes	Yes
Subs. Industry FE	Yes	Yes
Subs. Country FE	Yes	Yes
Adjusted R^2	0.136	0.579
Clustering	Country	Country

- **On average**, dirty subs are larger and more profitable!

Winner-picking assumptions

- **On average**, dirty subs are larger and more profitable!
- Ranking is more important than the average for profits!
  $\rightarrow$ The least profitable subs could be dirty, even though dirty subs are more profitable on average.



Winner-picking assumptions

- Extrapolate the model's prediction on profits to size: Profitable project(s) should be larger in size. This suggests that a more accurate way to test this prediction is by comparing the total sizes of two types of projects.
  $\rightarrow$ Example: Consider a firm with 3 projects. 1 is dirty, and the other 2 are clean. Dirty is 20 million. The others are 30 and 10 million. It is true that, on average, the dirty project is larger. Yet, the total size of the clean projects is larger in total.

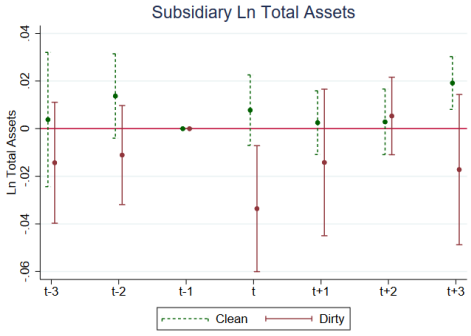
Winner-picking and EBA exercise

- **EBA**: After a decline in credit access, firms get smaller → ROA and emission intensity increase
  → The effect is driven by firm size.
  → Interpretation: Firms consider the profitability of their projects and kill the less profitable ones.
- **Alternative story**: The firms sell their side gigs to generate liquidity (to cover the decline in funds). This suggests a slightly different mechanism.
  → The side gigs (e.g. real estate) could have a higher external value than the main business (, which requires expertise, etc.). The choice of selling side gigs could be because of this difference. Also, such a sale is highly likely to increase profits mechanically.

Winner-picking and EBA exercise

- Additional heterogeneity tests: Why not exploit the size and the profitability of subsidiaries more explicitly?
  $\rightarrow$ Not all dirty subsidiaries are more profitable. Show that the effect is not there when this is the case.
  $\rightarrow$ Profitability gap between dirty and clean subsidiaries. The larger the gap, the larger the effect.

SBTi



- SBTi: Banks commit to sustainable lending
  - → Why is the decline in dirty subsidiaries temporary?
  - → SBTi implies a positive shock to clean subsidiaries. Why don't we see any effect?
  - → You can exploit the size of dirty subsidiaries to the parent company

Subsidiary classification

- Two observations about subsidiary classification
  $\rightarrow$ **1**: Clean subsidiaries are a part of the dirty business, yet they are not in the EU ETS register. Ex: RWE, Gasversorgung GmbH.
  $\rightarrow$ **2**: EU ETS is applied at the installation level, and there is a participation threshold. The larger of the two plants of the same company could be classified as dirty, while these two plants are doing exactly the same thing.

Other comments

- I'm not sure whether emission intensity is what we care about. If there is a decrease in production, even though intensity increases, the overall emissions decrease.
- Why does ln(emissions) have a positive coefficient?
- I think the change in EU ETS shouldn't affect your sample period. You can use the same set of GHGs.
- Figure 3 and 4 have different sets of fixed effects. Is there a reason for that?
- Why do you include parent and subsidiary fixed effects in Figure 4 at the same time?
- I didn't understand how parents decrease their emissions while we don't observe the same thing for the dirty subsidiaries?
- How should we interpret Kacperczyk and Peydro? They find similar things to your EBA exercise (a problem?), but they find higher, not lower, profits.
- Wouldn't using carbon emissions to proxy for dirtiness be easier and better?