

# Financing the low-carbon transition in Europe

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\*The views stated herein are those of the authors and are not necessarily the views of the Federal Reserve Bank of Chicago or the Federal Reserve System.

# Summary

- ▶ Using data from the EU emissions trading system, the authors study the interplay between corporate capital structure and cap-and-trade programs.
  - ▶ 4,000 non-financial firms subject to the EU ETS, 2013-2019.
- ▶ Firms with higher leverage reduce carbon emissions to a greater extent.
  - ▶ Emissions efficiency improves, driven by reductions in total firm emissions.
  - ▶ Effects concentrated among listed firms.
  - ▶ Highly-indebted firms are unable to fund the low-carbon transition.
- ▶ The use of “green finance” to fund the transition appears limited.

# Comments

- ▶ Paper presents importance evidence on the relation between leverage and carbon emissions.
- ▶ Capital structures are path-dependent so leverage an important force for low-carbon transition (see, Lemmon, Roberts, and Zender, 2008; DeAngelo and Roll, 2014).
- ▶ Comments on:
  - ▶ sample and panel regressions,
  - ▶ difference-in-differences tests around the 2018 introduction of more stringent emission targets,
  - ▶ economic interpretation

## Comment 1: Panel Regressions

- ▶ Higher leverage associated with lower carbon emissions/emissions efficiency.
  - ▶ The associations are stronger cross-sectionally than in the time series.
  - ▶ Is this association driven by firms' capital markets access/financial constraints? More constrained firms tend to lever more.
    - ▶ The leverage-emissions relation may have less to do with incentives to reduce emissions than with the ability to do so.
  - ▶ The listed/non-listed firms split helps alleviate this concern, more tests:
    - ▶ Account for banking relationships, access to bond and (private) equity markets, access to government financing.
- ▶ Controls from canonical leverage regressions:
  - ▶ Could you use firms' total asset/employees to proxy for size?
  - ▶ Some measure of asset tangibility?

## Comment 2: Diff-in-diff regressions

- ▶ Treatment is defined along two dimensions: excess leverage and emission permit shortfalls.
  - ▶ Leverage interacts with the tighter emission requirements:
    - ▶ Consider defining treatment in terms of emissions shortfalls and then partitioning the sample along the leverage dimension.
- ▶ Was the 2018 change in emission targets anticipated?
  - ▶ If so, both treated and control firms may have responded in advance of the rule change producing the flat line in figure 7.
- ▶ Similar concerns about the inclusion of more controls and the interpretation of coefficients.
- ▶ It may be useful to compare emitting to non-emitting firms to gauge the impact of the 2018 rule change.

## Comment 3: Interpretation

- ▶ How do these results reconcile with studies documenting higher financing costs of cap-and-trade programs?
  - ▶ For example, Ivanov, Kruttli, Watugala (2022) and Delis, de Greiff, Ongena (2019).
  - ▶ The “discipling effect of leverage” channel suggests that financing costs may ultimately decrease after cap-and-trade regulation.
- ▶ How do the results reconcile with the international evidence on financing costs of cap-trade-regulation?
  - ▶ What can we learn from the emissions-leverage relation for firms that can avoid these regulations by “exporting” emissions?