



Going green by putting a price on pollution: Firm-level evidence from the EU

National Bank of Belgium
Climate Change: Economic impact and challenges for central banks and the financial system

22 October 2020

Discussant: Dr Mirabelle Muûls

The EU ETS

- The EU Emissions Trading Scheme is the largest GHG emissions trading system in the world.
- It covers GHG emissions from more than 12,000 power stations and industrial plants in 31 countries.
- Authors use detailed firm level data covering the period 2014-2019 to analyse firm-level impacts of the EU ETS.
- They demonstrate detailed understanding of the policy's details and evolution
- An exciting project!



Overview

Primary research question:

What is the impact of the EU ETS on the emission efficiency of firms, and how does this depend on the price of emission allowances?

Key findings:

- Emission trading schemes improve the emission efficiency of highly polluting firms.
- The efficiency gain comes from a relative decrease in emissions.
- Part of the improvement is realized via the acquisition of “green” firms.
- The size of the improvement depends on the initial allocation of free emission allowances

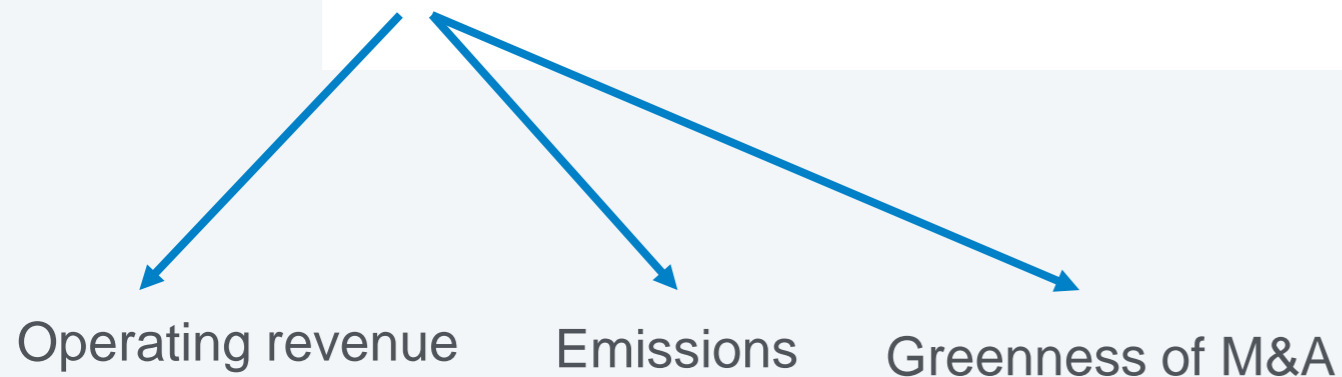
Empirical strategy

Measurement of exposure to increase in price

$$Allowance\ Shortage_i = \frac{1}{4} \sum_{y=2013}^{2016} \frac{emissions_{i,y} - free\ emission\ allowances_{i,y}}{total\ assets_{i,y}}$$

Difference in difference estimation

$$Y_{i,t} = \beta_1 Post_t + \beta_2 High\ Exposure_i + \beta_3 High\ Exposure_i \times Post_t + \beta_4 X_{i,t} + \epsilon_{i,t}$$



Each of these represents an impressive data collection and matching effort

Question 1: Causation/Theory

- Since permits were not allocated at random to individual firms, can this heterogeneity be thought of in a causal fashion ?
- The results DO provide suggestive evidence that the initial allocation of permits mattered in the context of the EU ETS.
- Potential explanation/model: Firms that received fewer permits than needed likely perceived the policy as more stringent than those with a more generous permit surplus, in particular with a higher price. Firms with a permit surplus did not have to reduce emissions in order to comply – and chose not to.

Question 2: Hypothesis testing and robustness

- Paper is very strongly demonstrating the unexpected nature of the price increase.
- Assumption about the ETS having no impact in previous years could be better substantiated for the sample, given the literature findings
- 2019 availability should improve in the coming months
- Based on the mechanism identified when highlighting explanations as to why allocation matters, what is the industry heterogeneity?
- In particular, evidence of cost pass-through of electricity providers might mean they should not be as affected by increasing permit prices?
- Could machine learning/text analysis algorithms improve the classification of M&A deals?
- Is there anything to explore in terms of sales of green/non-green affiliates?

Question 3: Indirect emissions

- Authors measure only those emissions associated with direct energy use
- Would there be ways to impute emissions from electricity using estimates of marginal emissions rates to look at trends in overall emissions?
- Maybe there is an opportunity to use matching, in particular on firm-level energy profiles?

Summary

- These authors bring very rich data to a very important question.
- Ideally the paper would try to frame the analysis around understanding why allocation does matter.
- Potential use of matching to ensure that similar firms are being compared and that there was no previous reduction in emissions.
- Exploring if anything can be made to address the indirect effects of the regulation.
- Very promising results with high policy implications.