

Multinational corporations and the EU-ETS: Asset erosion and creeping deindustrialization

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Overview

The European Union Emissions Trading System (EU-ETS) is the EU's flagship tool to fight climate change and the world's leading carbon market. However, it may threaten the international competitiveness of the firms subject to it, which could lead to a relocation of economic activity and ultimately an increase in global emissions. This possibility of creeping deindustrialization is intensely debated among scholars and policy makers. We explore creeping deindustrialization where it should be most likely to occur, i.e. in the context of multinational enterprises (MNEs).

MNEs are complex network structures, connecting multiple subsidiaries across national borders. These structures enable them to circumvent regulation by reallocating activities within their networks. While the literature has investigated competitiveness effects of the EU-ETS at the firm level (Chan *et al.*, 2013; Martin *et al.*, 2014; Petrick and Wagner, 2014), little is known about this possibly important leakage channel within MNEs (Dechezleprêtre *et al.*, 2015; Martin *et al.*, 2016 forthcoming). Our paper is the first to identify multinational networks across time and space in the EU-ETS in order to assess creeping deindustrialization within these networks.

Methods

For our full panel of ETS-firms observed between 2002 and 2012, we construct control groups based on pre-treatment firm and network characteristics using a propensity score approach (nearest-neighbor matching). Applying a difference-in-differences approach, we then examine if the EU-ETS induced different asset dynamics and investment behavior. Especially, we investigate whether or not firms connected to multinational business groups behaved differently.

All analyses are performed for different subsets of the data, starting from the overall level of regulated firms, then narrowing down the sample to companies in the manufacturing sector with a high risk of carbon leakage.

We validate the robustness of our results by applying a large variety of different matching and model specifications.

Data

We employ the global firm-level database ORBIS of Bureau van Dijk (BvD), which contains harmonized financial data and data on firm ownership. We map the ownership structures of 12.5 million firms that are above the EU's small business threshold to identify all economically relevant firms connected to MNEs.

We then combine this data with the European Union Transaction Log (EUTL), which provides emission information at the plant level. We successfully match 8.218 out of all 8.578 companies (96%) that hold installations under the EU-ETS, corresponding to 14.507 out of a total of 15.043 plants (96%). Plant locations are identified by using geocoding methods (Figure 1).

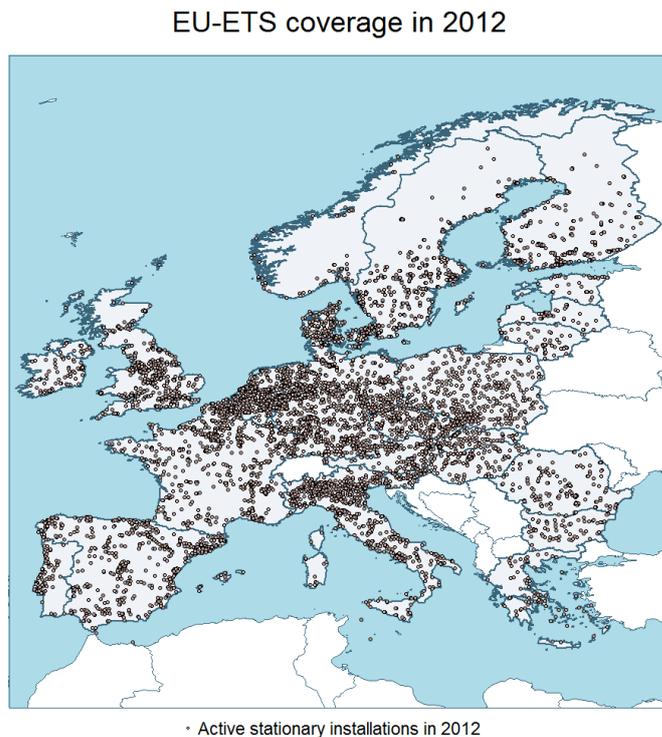
The final multilevel dataset captures information on the regulated plants, their direct company owners, and their global ultimate owners (GUOs) along with multinational network characteristics.

Preliminary results

We use our unique dataset to explore the importance of MNEs in the EU-ETS. Descriptive results indicate that business groups are responsible for 90% of total emissions in 2012 (Figure 2). In many countries, the top ten European business groups account for up to 50% of emissions in 2012 (

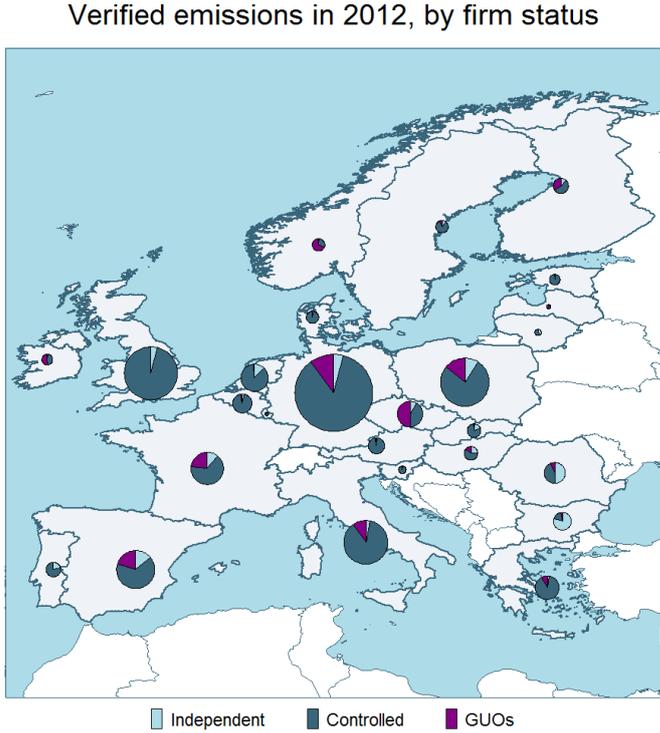
Figure 3). They also connect a large number of regulated plants (Figure 4). This indicates that companies should be looked at as part of networks. Due to a lack of data, previous analyses often viewed them as independent and restricted by national borders. In addition, we find that a substantial amount of manufacturing companies are part of a global network that have links to firms operating in the exact same sector but outside the EU (Figure 5, corresponding to more than 60% of ETS emissions in most years).

Figure 1: EU-ETS coverage in 2012.



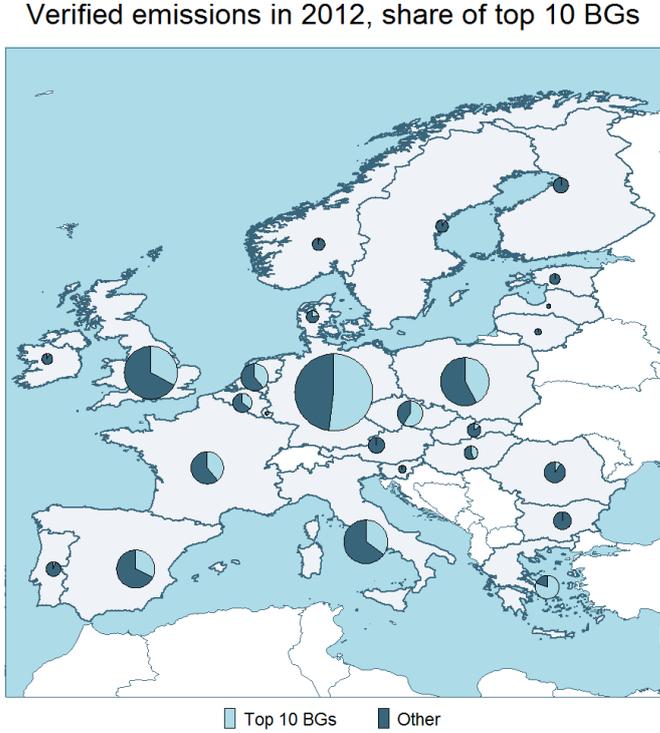
Source: Location data: EUTL. Geocodes: MapPoint, Google Earth.

Figure 2: Verified emissions in 2012, by firm status.



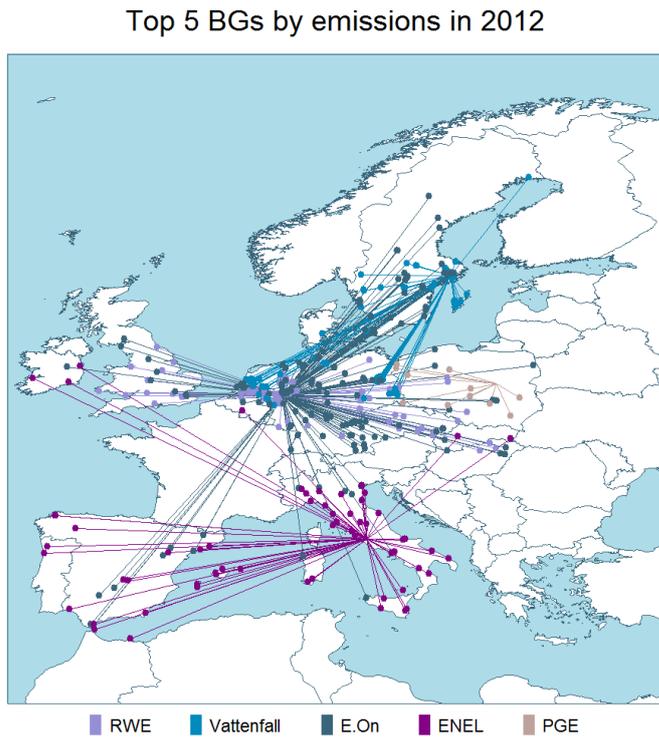
Emissions: EUTL. Ownership data: ORBIS.

Figure 3: Verified emissions in 2012, share of top 10 BGs.



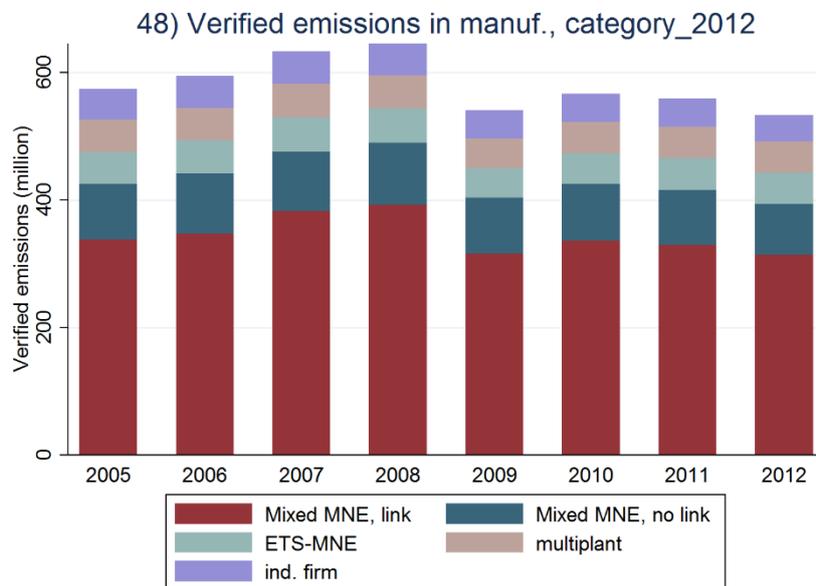
Emissions: EUTL. Ownership data: ORBIS.

Figure 4: Top 5 BGs by emissions in 2012.



Emissions: EUTL. Ownership data: ORBIS. Geocodes: MapPoint, Google Earth.

Figure 5: Verified emissions in manufacturing by firm type, 2012 ownership structure



Source: Emissions: EUTL. Sector data: ORBIS.

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