

# ESG Disclosure Mandates and Emissions in Global Value Chains

Nico Nastri

American University Economics Department

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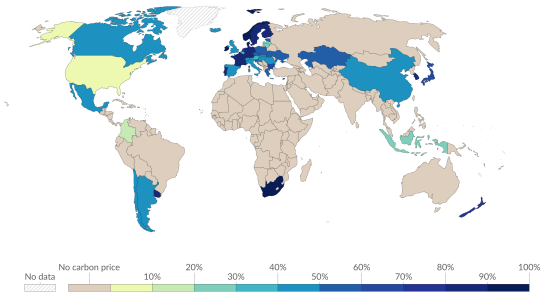
# Motivation: Asymmetric Emissions Regulation

- ▶ Climate regulation is highly asymmetric across countries.

## Share of CO<sub>2</sub> emissions covered by a carbon price, 2024



Carbon dioxide emissions are included in this figure if they are covered by a carbon tax or trading system.



Data source: Dolphin and Merkle (2024)

OurWorldInData.org/co2-and-greenhouse-gas-emissions | CC BY

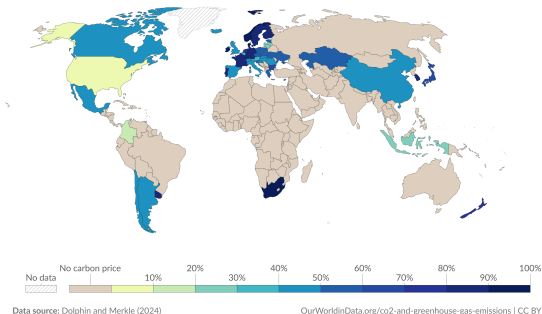
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- ▶ Firms may shift emissions-intensive production to less regulated jurisdictions. Imports have untaxed CO<sub>2</sub> emissions.

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Our World  
in Data



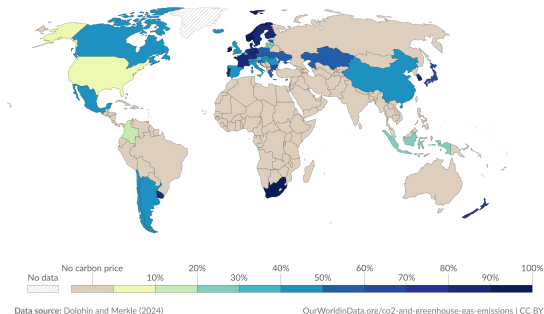
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★ Policymakers increasingly seek to curb carbon embedded in imports.

## Policy Tools for Reducing Carbon in Imports

- ▶ Policymakers use several tools to reduce the carbon in trade.
  - ▶ Carbon tariffs: Impose carbon costs on imports (EU CBAM).
  - ▶ Climate clubs: Coordinate carbon pricing across countries (Nordhaus).

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Can mandatory ESG data reporting reduce emissions embedded in GVCs?

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### What is ESG Data?

- ▶ Non-financial firm data.
  - ▶ *E*nvironmental: Carbon footprint, resource and land use.
  - ▶ *S*ocial: Labor standards, diversity, health and safety.
  - ▶ *G*overnance: Corporate structure, tax transparency.

### ESG Reporting & Scoring

- ▶ Collected and reported by firms voluntarily.
- ▶ Ratings agencies generate scores.

# Overview

## Background

- ▶ Study EU's non-financial reporting directive (NFRD).
  - ▶ Passed in 2014 and came into effect in FY 2017.
- ▶ Mandated ESG reporting for EU firms with 500+ employees.
  - ★ Must report non-financial information about suppliers.

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## Identification Strategy

- ▶ Construct “exposure” index for non-EU country-industries.
- ▶ Event study with “exposure” as continuous treatment.

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## Identification Strategy

- ▶ Construct “exposure” index for non-EU country-industries.
- ▶ Event study with “exposure” as continuous treatment.

## Results

- ① ESG reporting rises modestly, but ESG scores drop.
  - ▶ Firms report more but don't reduce emissions.
- ② Reduced total emissions in EU bound exports.
  - ▶ Driven by lower trade volume → consistent with scale effect.

# Data

Panel of 49 non-EU countries and 20 manufacturing/extraction industries.

- ▶ Study period from 2010-2020.

Exposure Index

- ▶ OECD ICIO: Cross-border country-industry trade
- ▶ Eurostat: Regulated firms' share of purchases

Data for the outcome variables

- ▶ MSCI: ESG reporting and carbon scores
- ▶ OECD ICIO: Trade and intermediate export outcomes
- ▶ OECD Emissions data: Emissions embodied in bilateral trade

## Measuring Exposure to the NFRD

**Exposure:** Share of output from non-EU country-industry  $ci$  that is purchased by regulated firms in the EU in 2010 (pre-NFRD).

- ▶ Does not vary over time.

$$\text{Raw Exposure}_{ci,2010} = \frac{\text{Industry } it \text{ goods purchased by NFRD firms}}{\text{Total output of industry } ci} \quad (1)$$

- ★ Challenge: Identifying goods purchased by NFRD firms.

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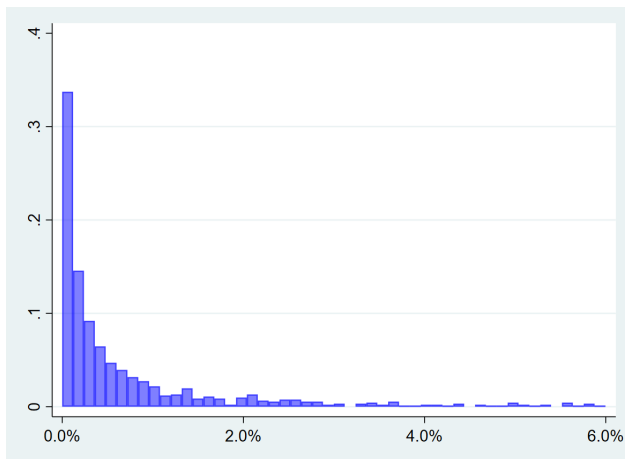
- ★ Challenge: Identifying goods purchased by NFRD firms.

Eurostat [more](#)

- ▶ EU industry level data on share of intermediate goods purchased by firms with 250+ employees.

## Distribution of Rescaled Exposure to NFRD

$$\text{Exposure}_{it} = \frac{\text{Raw Exposure}_{it}}{P_{75}(\text{Raw Exposure}) - P_{25}(\text{Raw Exposure})} \quad (2)$$



# Event Study Framework

- ▶ Event study with TWFE and a continuous treatment variable.

$$Y_{cit} = \alpha_{cit} + \sum_{\tilde{t} \neq 2013} \beta_t(Exposure_{ci,2010}) \times 1(\tilde{t} = t) + X_{ct} + \gamma_{ci} + \lambda_t + \epsilon_{cit}$$

## Outcome Variables

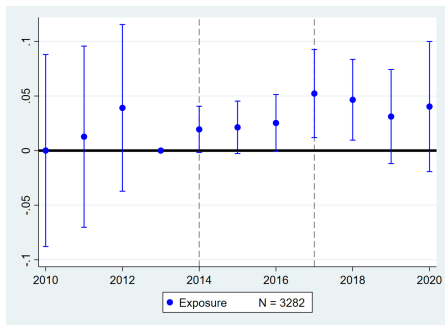
- 1 ESG Reporting & Scoring
- 2 Emissions embodied in trade
- 3 Trade volumes

## Control Variables

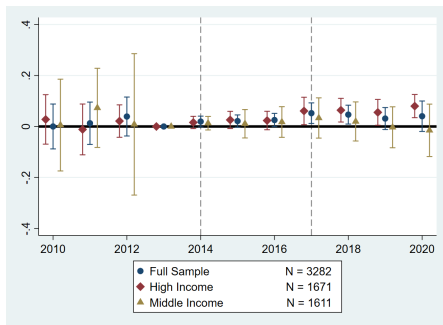
- ▶ Macro indicator (GDP)
- ▶ Number of environmental policies
- ▶ Country-industry & time FE

# ESG Reporting

## Full Sample



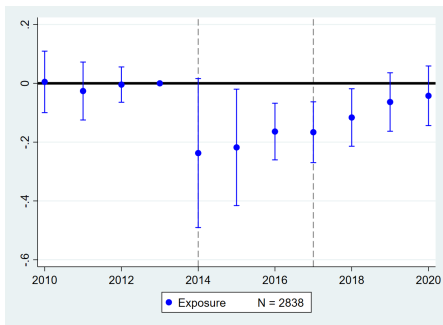
## By Income



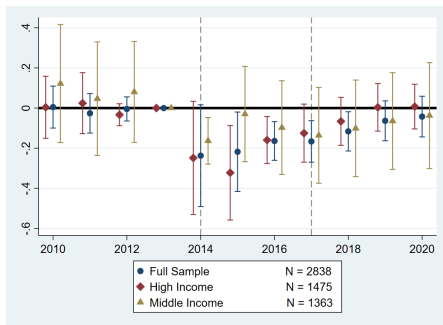
● Full Sample N = 3282  
◆ High Income N = 1671  
▲ Middle Income N = 1611

# ESG Scoring

## Full Sample

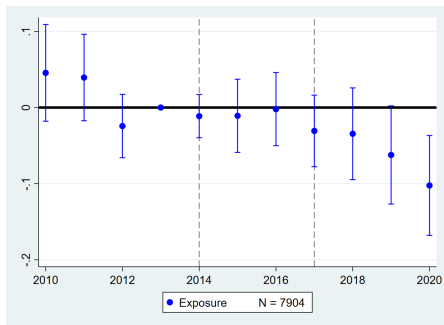


## By Income

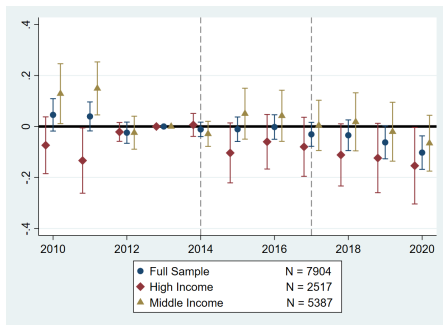


# Emissions Embedded in Exports to EU (Intermed. Goods)

## Full Sample

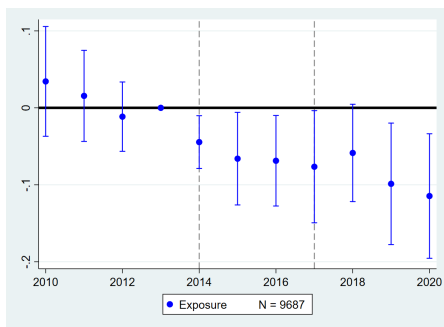


## By Income

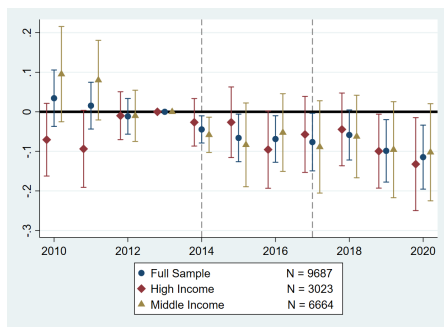


# Exports to EU (Intermediate Goods)

## Full Sample



## By Income



# Conclusion

## Main Findings

- 1 ESG reporting rises modestly, mainly in high-income countries.
- 2 This is accompanied by a large drop in ESG scores.
- 3 More exposed firms reduce total emissions in EU bound exports.
- 4 Driven by lower trade volume → consistent with scale effect.

## Policy Takeaways

- 1 ESG disclosure mandates can reduce emissions entering a country through global value chains.
- 2 But this appears to operate by making trade with the regulated market less attractive, not by inducing foreign suppliers to improve environmental performance.

Thank You

## Measuring Exposure to the NFRD Back

$$\text{Raw Exposure}_{ci,2010} = \frac{\sum_F \sum_J \left[ X_{ci,2010}^{fj} \times \psi_{2010}^{fj} \right]}{\Omega_{ci,2010}} \quad (3)$$

$ci$  = origin country-industry,       $fj$  = destination country-industry

### OECD Inter-Country Input-Output Tables (ICIO)

- ▶  $X$ : Exports from origin  $ci$  to destination  $fj$ .
- ▶  $\Omega$ : Total output in  $ci$ .

### EuroStat

- ▶  $\psi$ : Share of intermediate goods purchased by regulated firms in  $fj$ .