# THE IMPACT OF THE EUROPEAN UNION EMISSIONS TRADING SYSTEM ON CARBON EMISSIONS AND ECONOMIC PERFORMANCE

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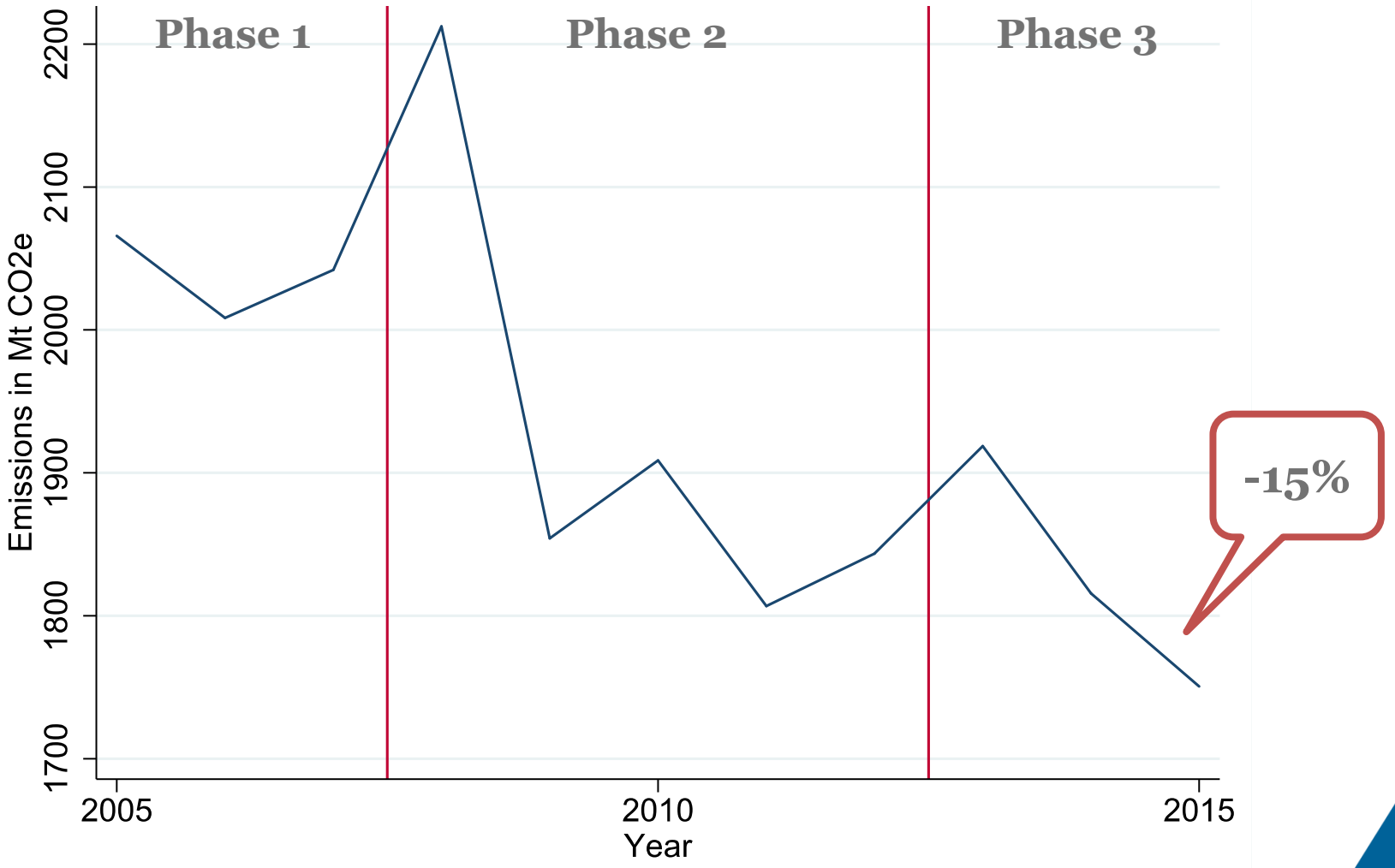
BETTER POLICIES FOR BETTER LIVES

# EU ETS: background

- Running since 2005 across 31 countries
- 12,000 covered installations (~8,000 firms), 40% of European GHG emissions

- The largest carbon market in the world
  - Other markets in US, Canada, NZ, Korea, China
  - Plans in Japan, Chile, Mexico

# Carbon emissions by EU ETS installations




Source: Own calculations based on EUTL

# Questions

- Did the EU ETS cause the emissions decline?
- If so, did it affect the performance of regulated firms?

➢ Empirically analyse the *causal* impact of the EU ETS on carbon emissions & firm performance

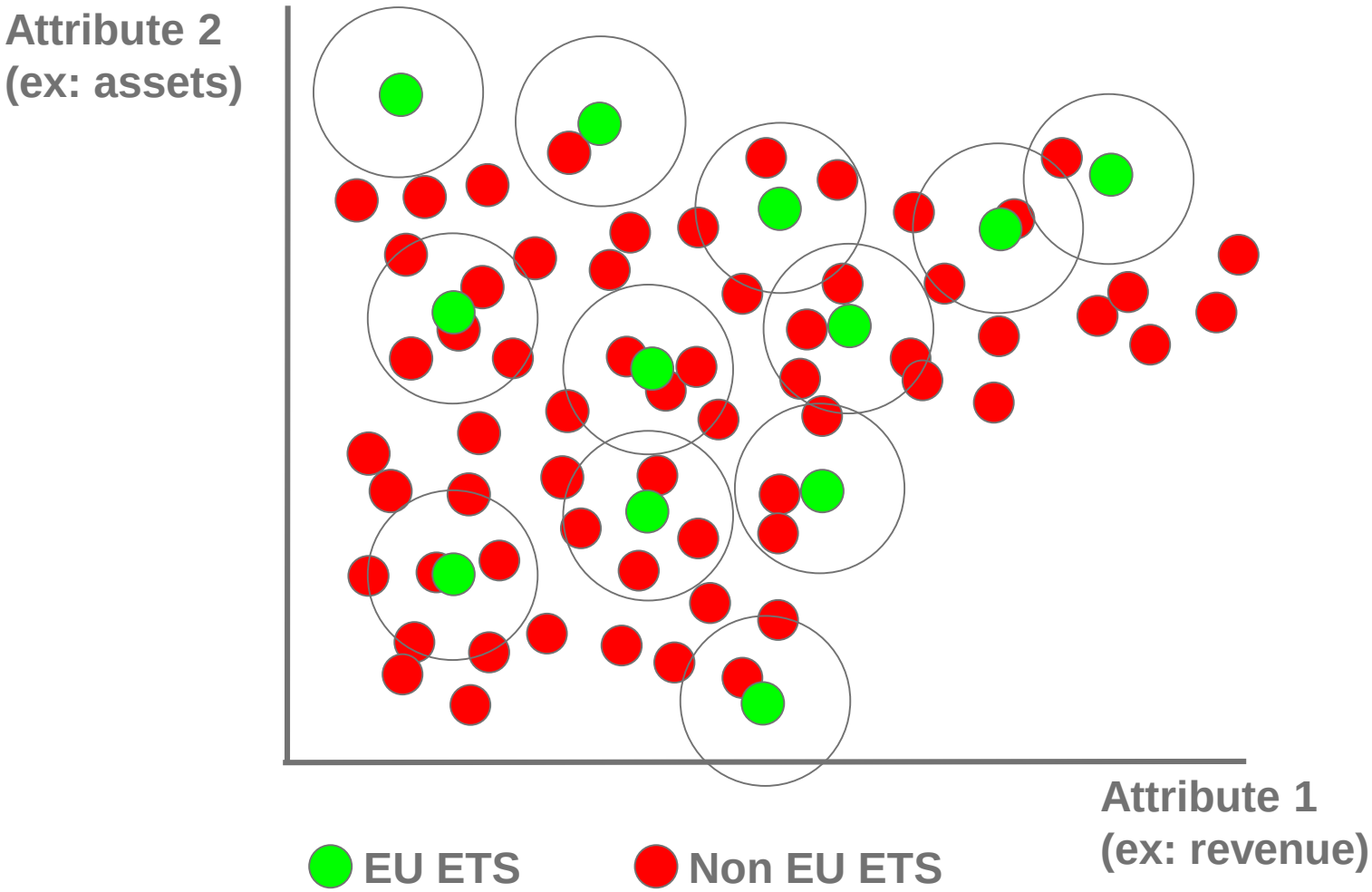
  – Using firm and installation-level data

  – Across Europe

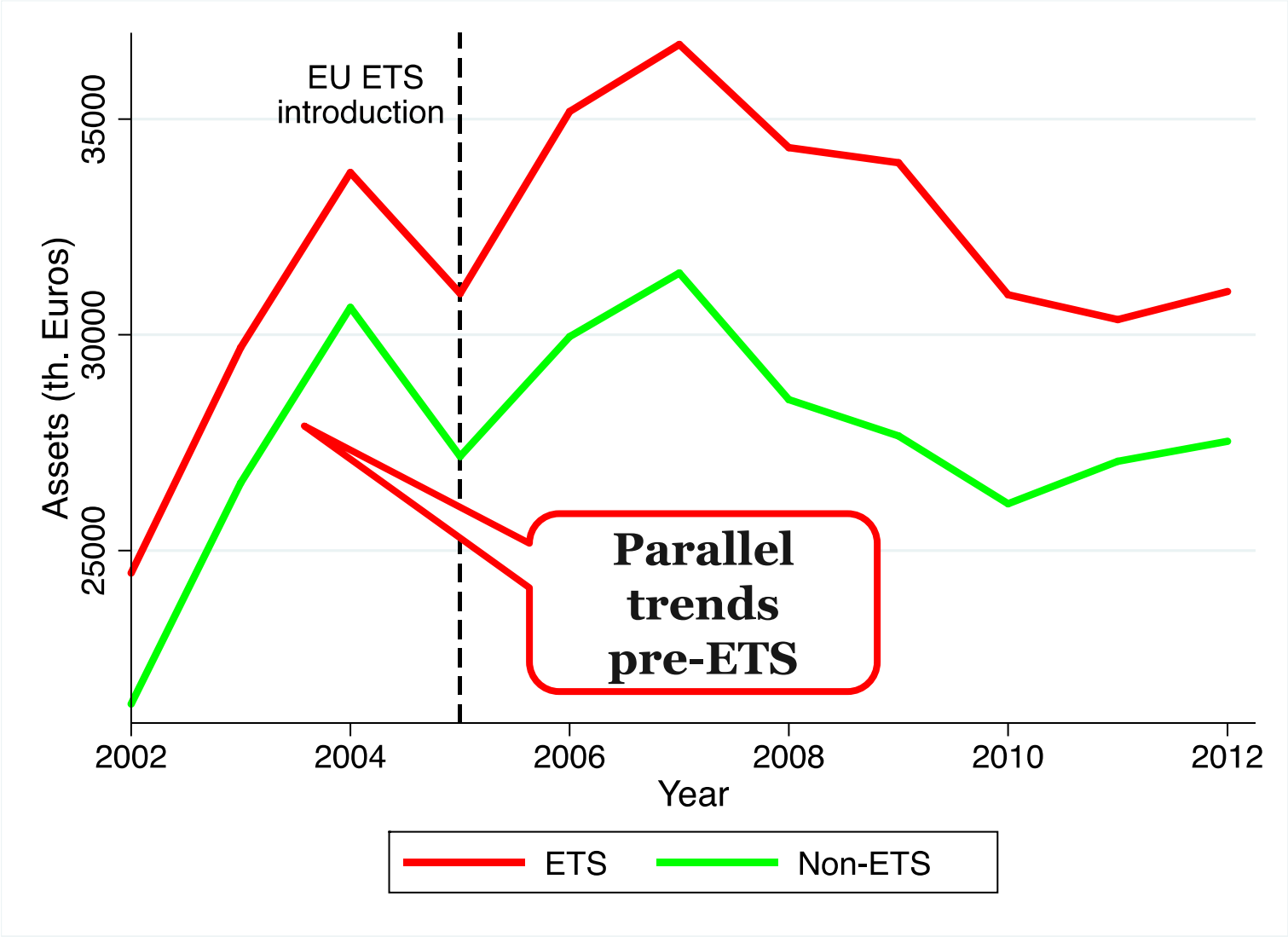
# Evaluating the impact of EU ETS

- Not all carbon-emitting plants are regulated
  - Inclusion criteria at installation level related to **production capacity**
- Establishing the policy's causal effect
  - Identify regulated installations & companies
  - Construct a control group of similar but unregulated entities and compare with regulated entities
- Control group:
  - Same country, same sector, similar pre-2005 characteristics (e.g. carbon emissions, financials) but below threshold

# A “matching” method



# ETS effect: ex. firms' fixed assets



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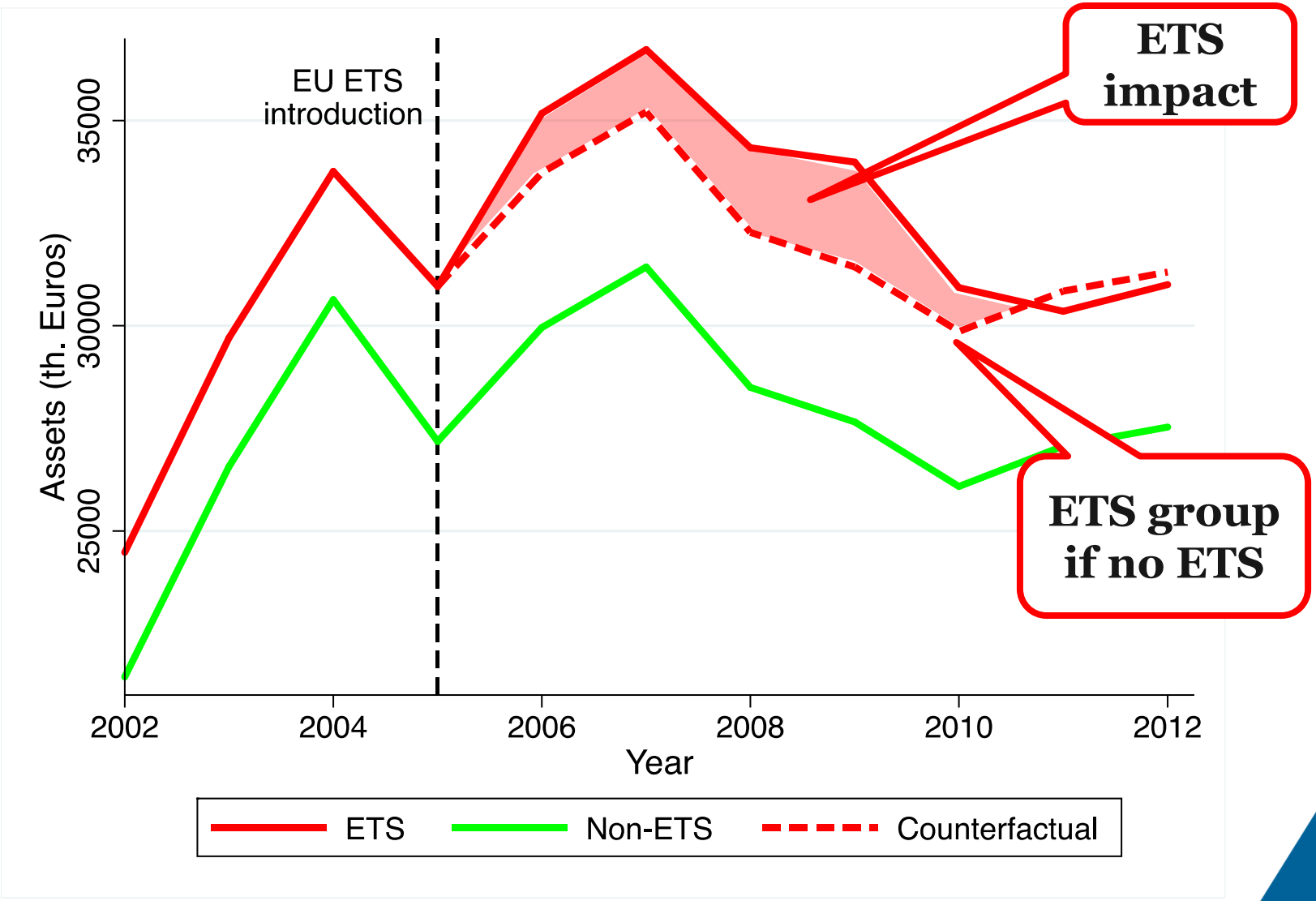


# IMPACT ON CARBON EMISSIONS

# Emissions Data

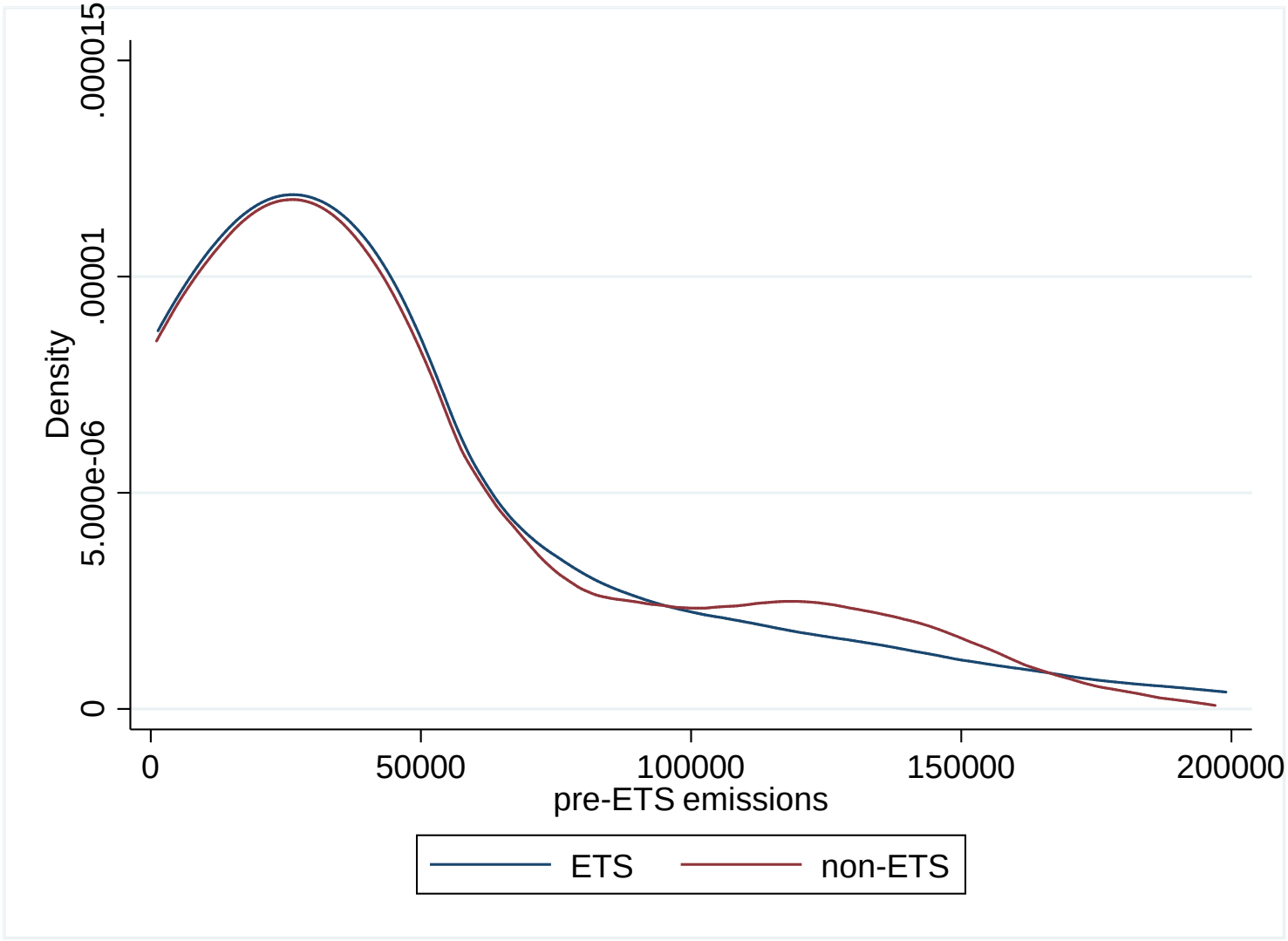
- National Pollution Release and Transfer Registries (PRTR)
  - At installation level (pre and post ETS)
  - France, UK, Netherlands, Norway

| Country | Coverage since | Reporting threshold | # installations | # installations with reported CO2 emissions |
|---|---|---|---|---|
| France | 2003 | 10 kt | 14,797 | 1,648 |
| Netherlands | 1990 | < 1 kt | 1,849 | 1,593 |
| Norway | 1997 | < 1 kt | 1,447 | 499 |
| United Kingdom | 1998 | 10 kt | 5,500 | 1,024 |

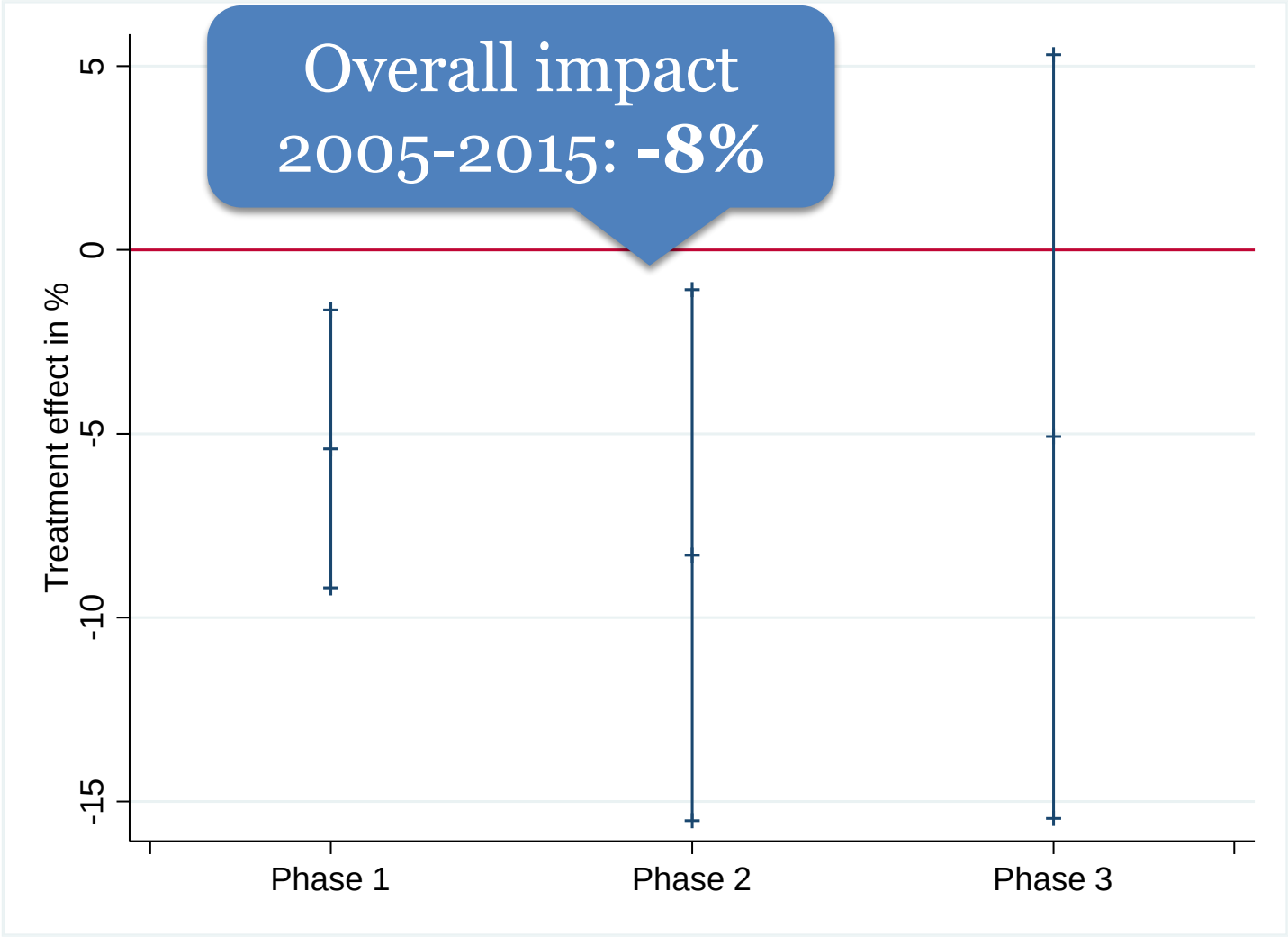
# Matching

- Nearest neighbour matching on
  - Country
  - Economic sector
  - Pre-ETS emissions
  - Pre-ETS emissions trend
- Focus on manufacturing
- Around 500 installations

# After matching: Emissions distribution

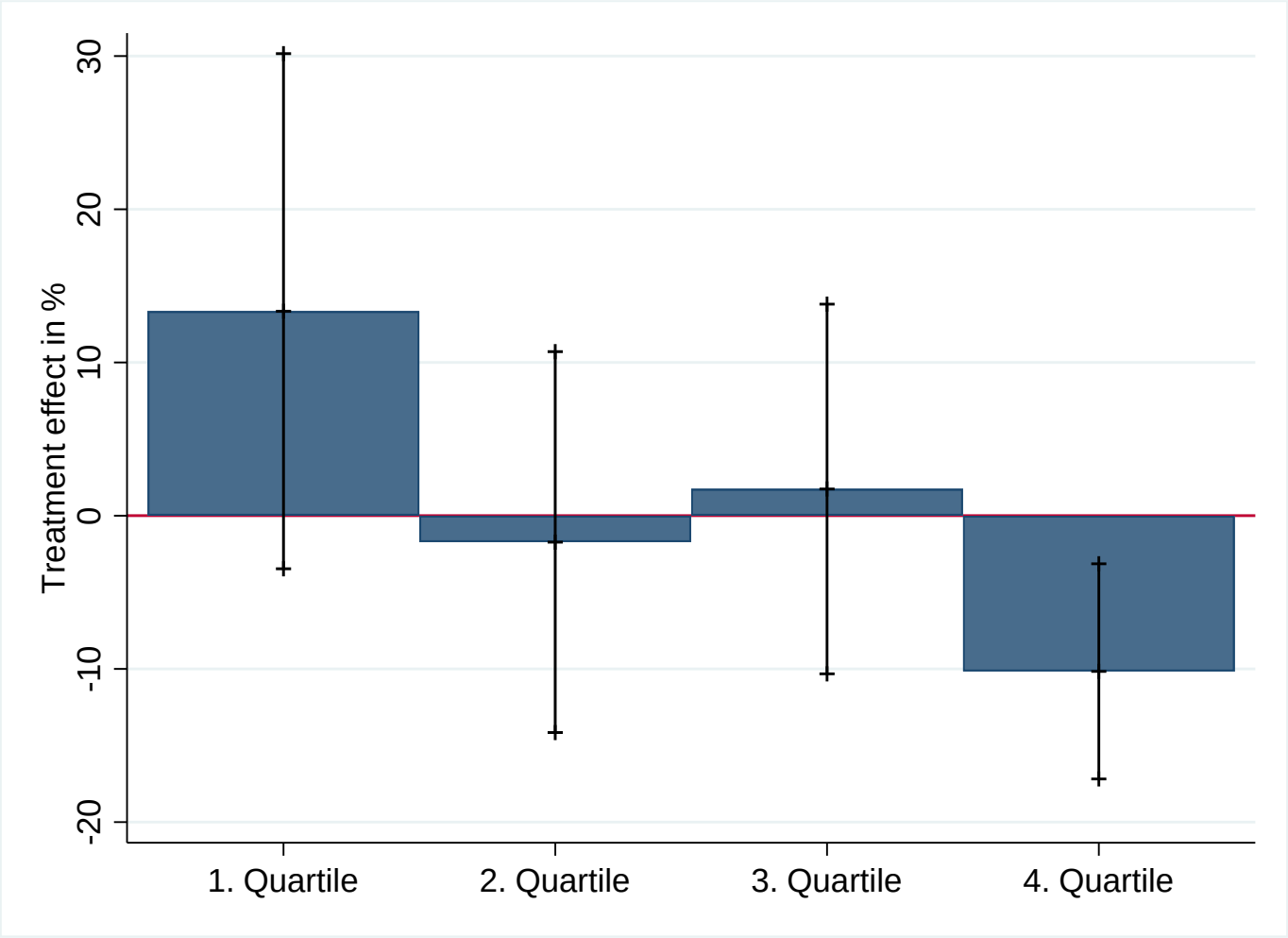


# ETS impact on emissions by phase

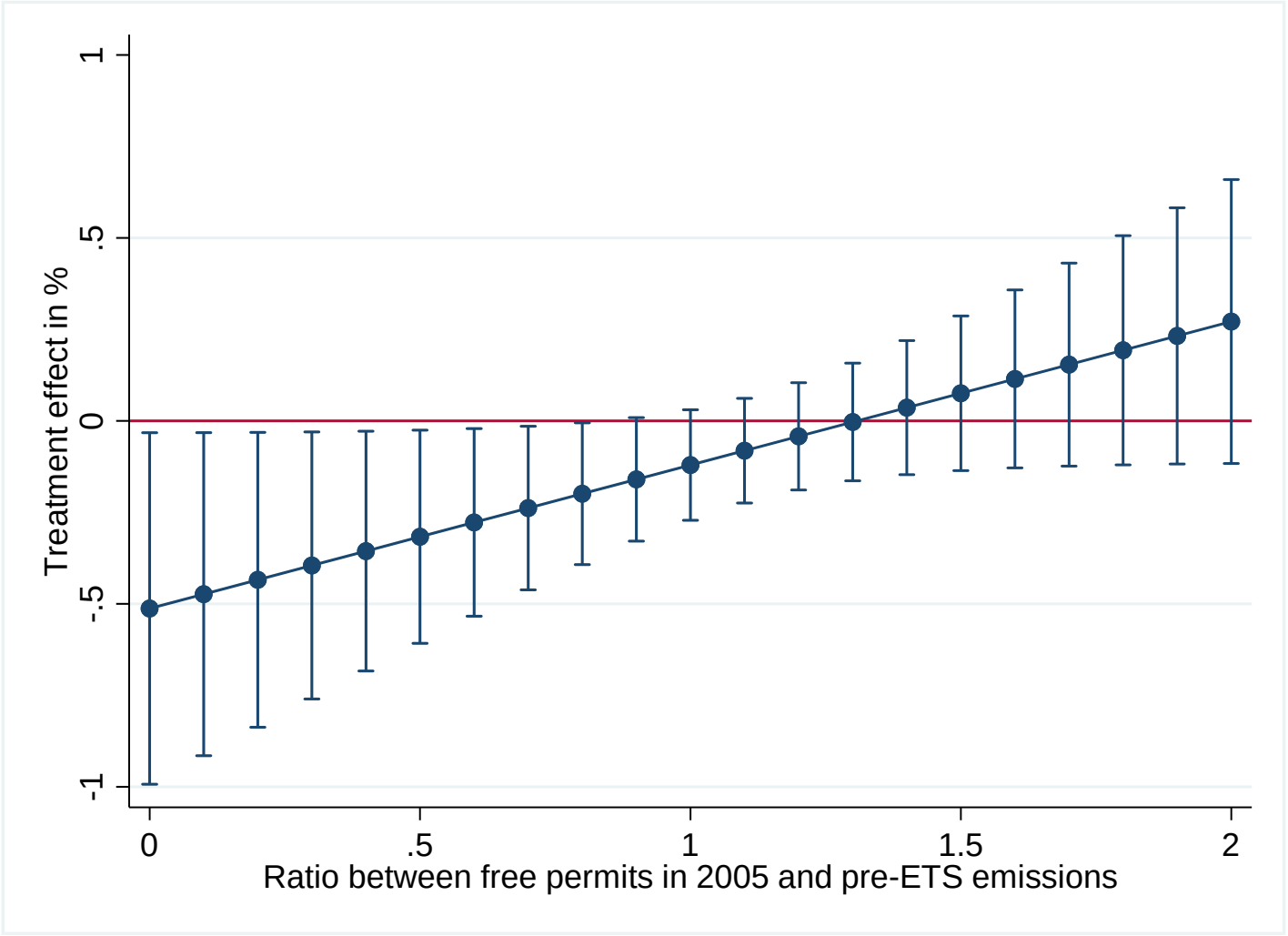


# Price of EU ETS allowances 2005-2015

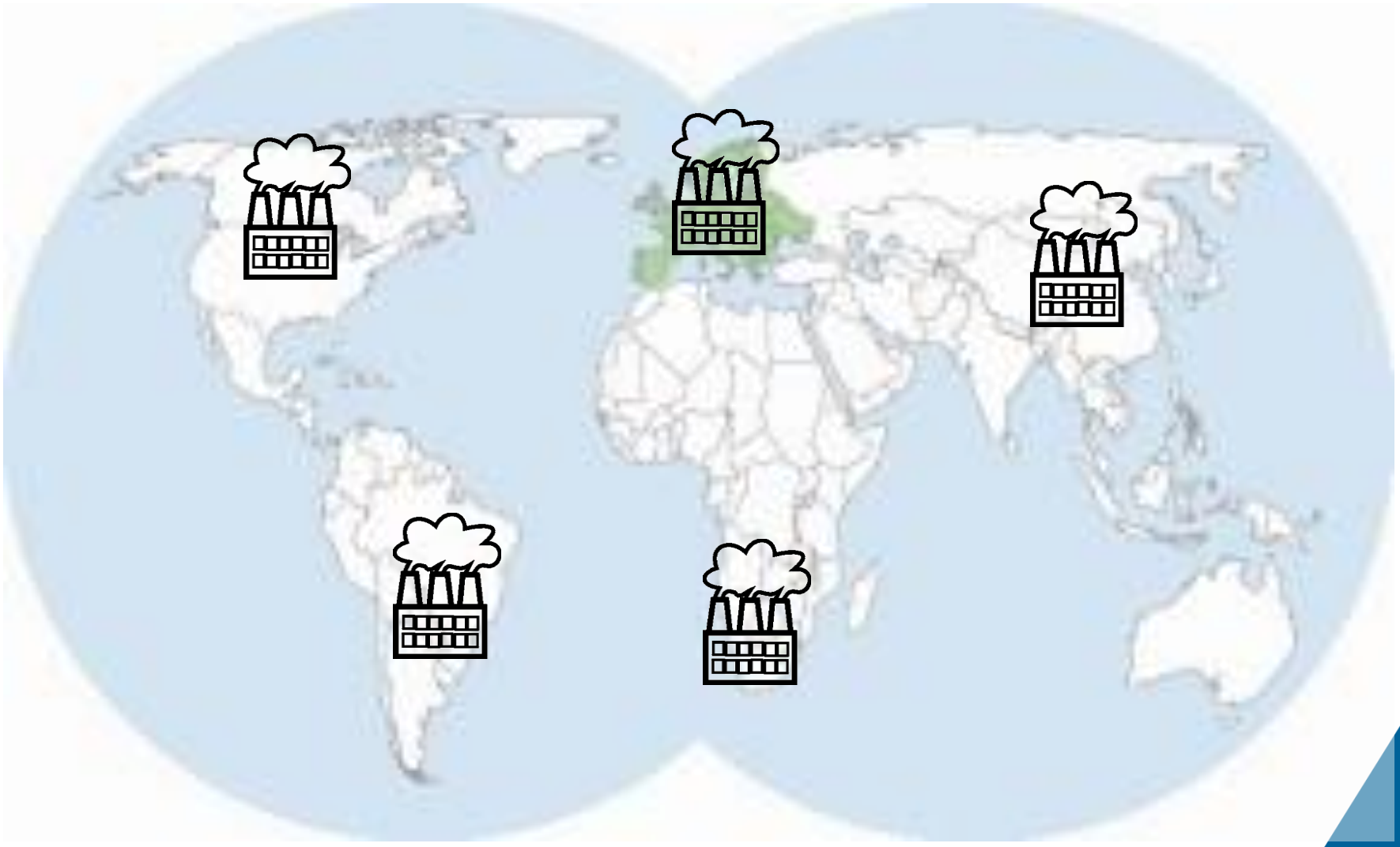
# Results by size (pre-ETS emissions)



# Free allowances matter!



# Is it simply leaking?



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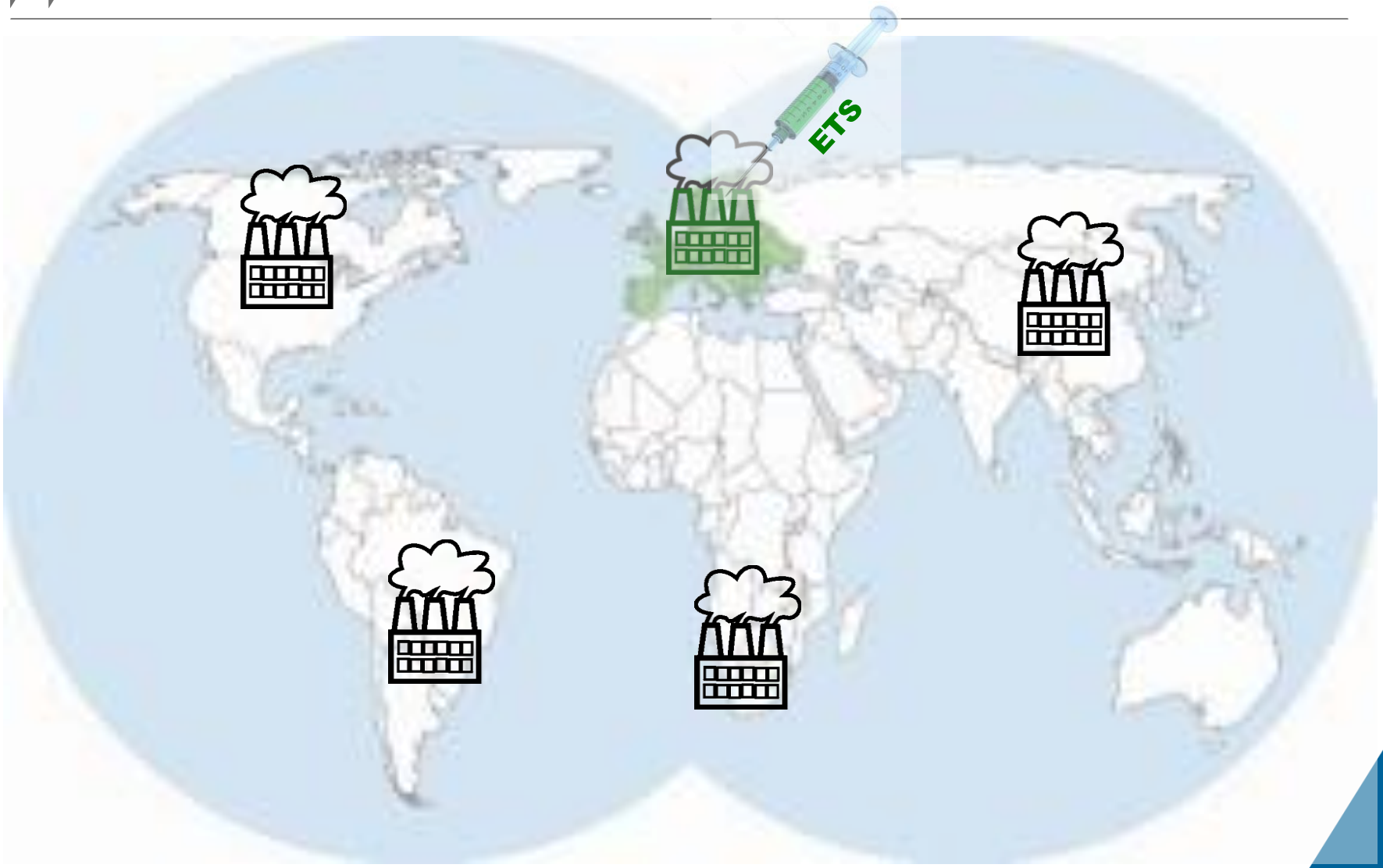

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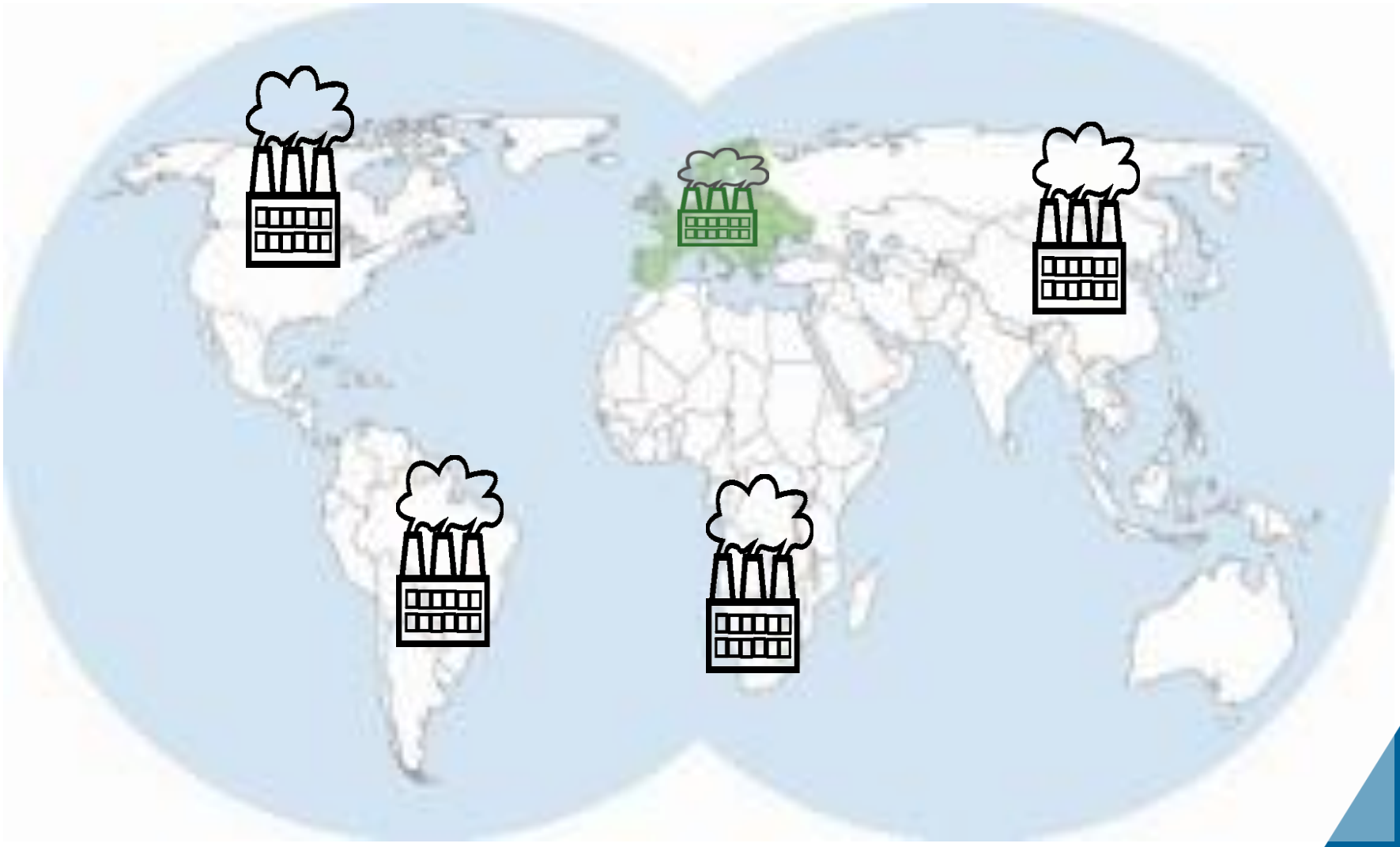
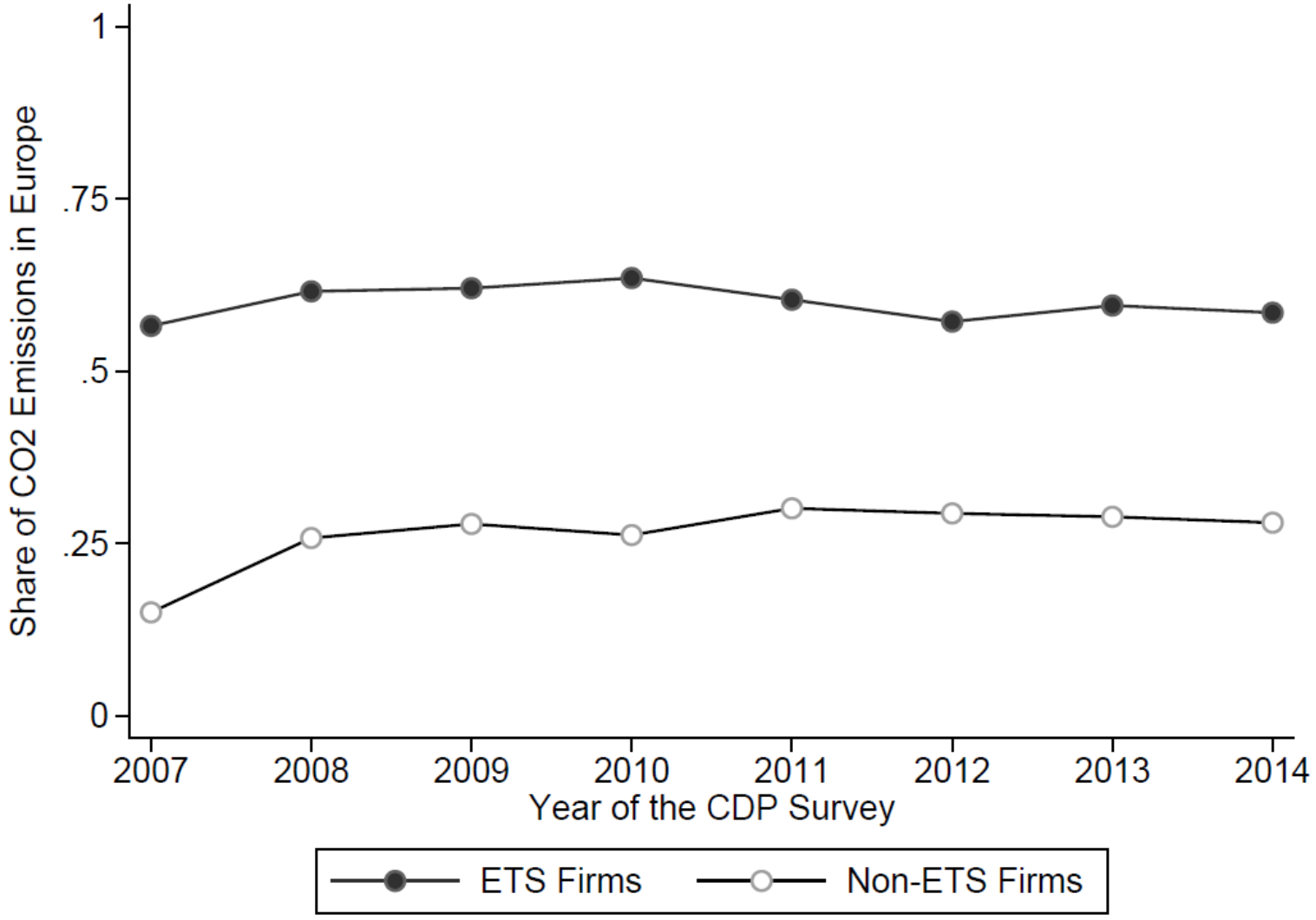


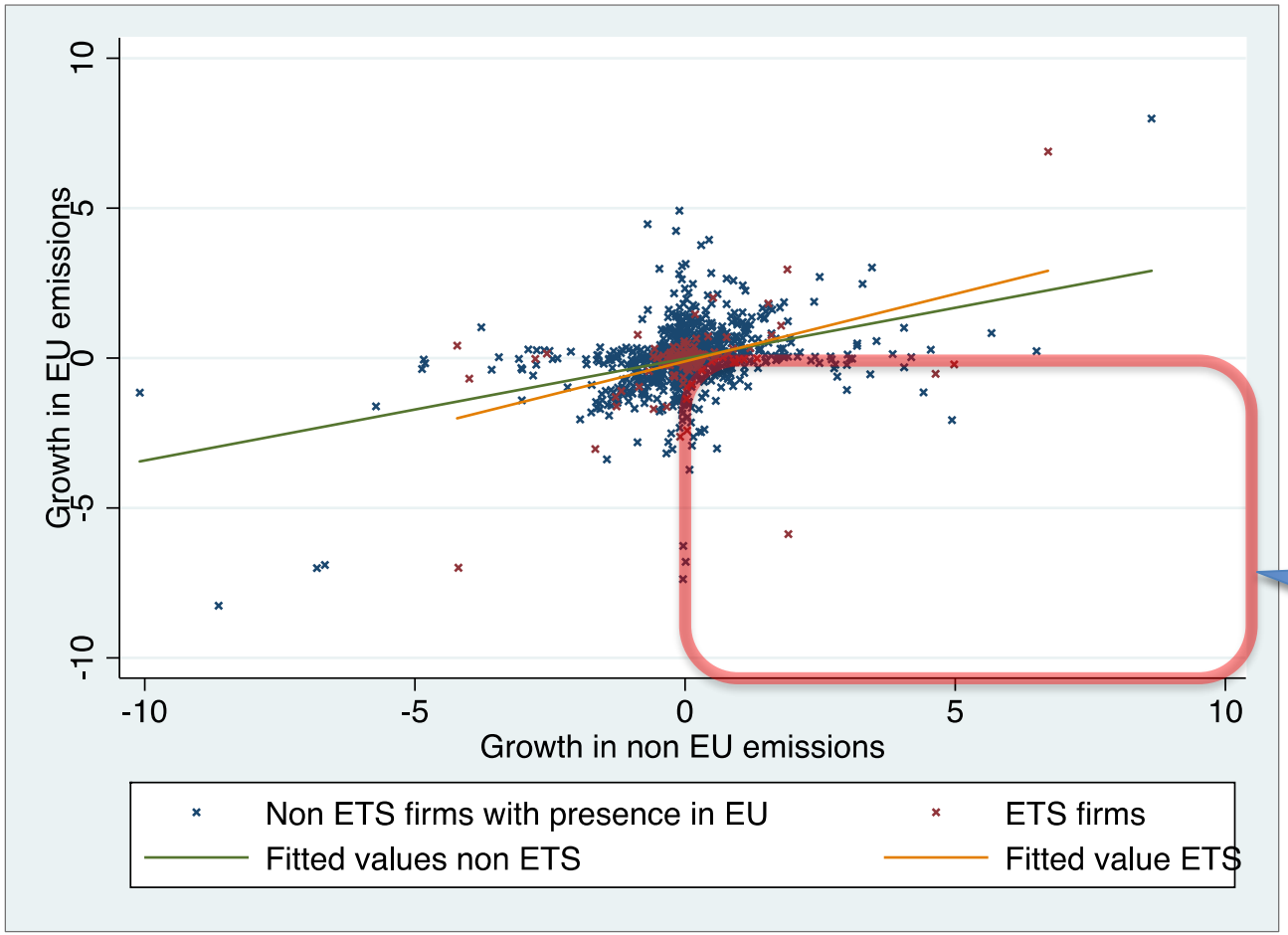
# Evidence from multinational data

- Carbon Disclosure Project: firm-level carbon emissions by country
  - NGO acting on behalf of over 600 institutional investors
  - Since 2003 asked listed companies to disclose information on emissions
  - 1,041 companies, 2007-2014 (unbalanced)
- Focus on multinational companies operating both within and outside the EU
  - Should be easier for them to relocate activities

# Share of EU emissions



# Growth of CO2 emissions in the EU vs the rest of the World




Any leaks here?

# IMPACT ON FIRM PERFORMANCE

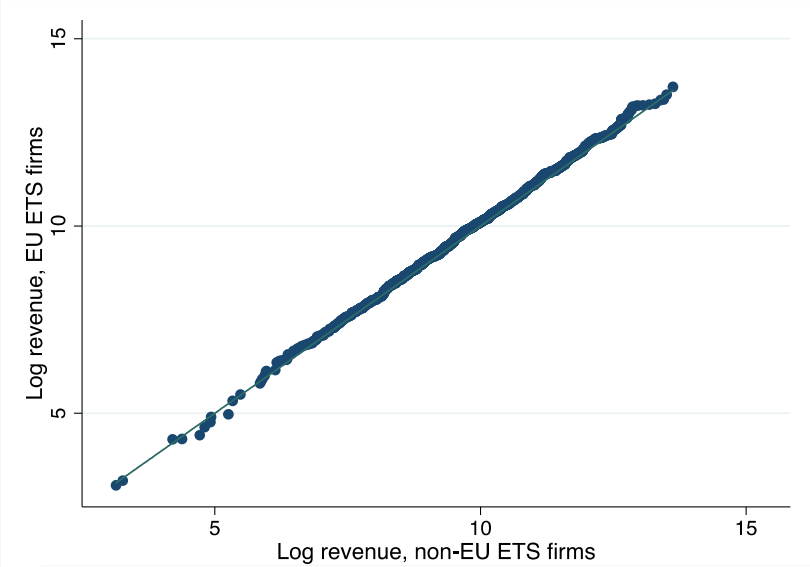
# Firm performance data

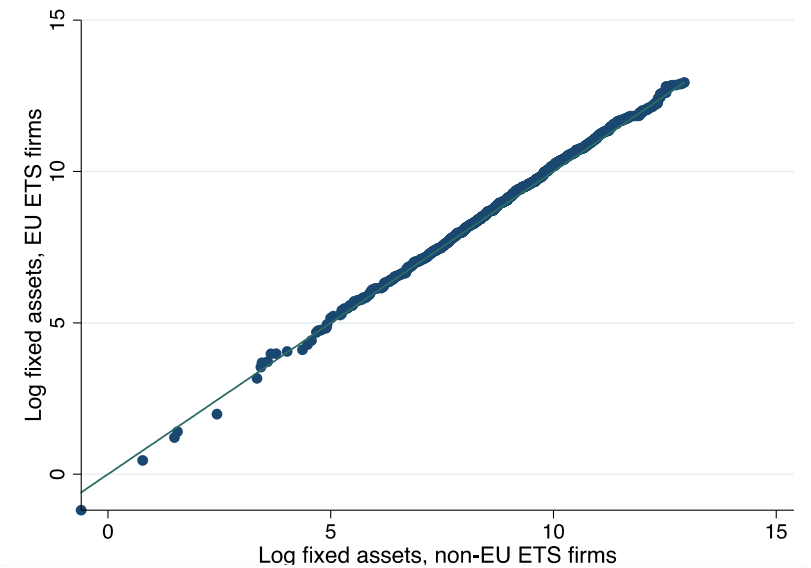
- Orbis global financial database
  - At firm level (pre and post ETS)
  - All EU ETS countries
- EU ETS companies: own at least one EU ETS installation

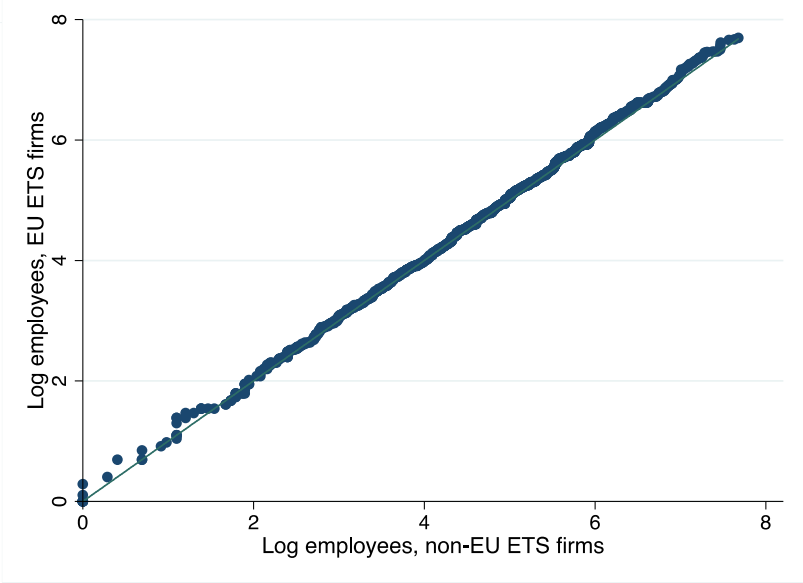
# Matching

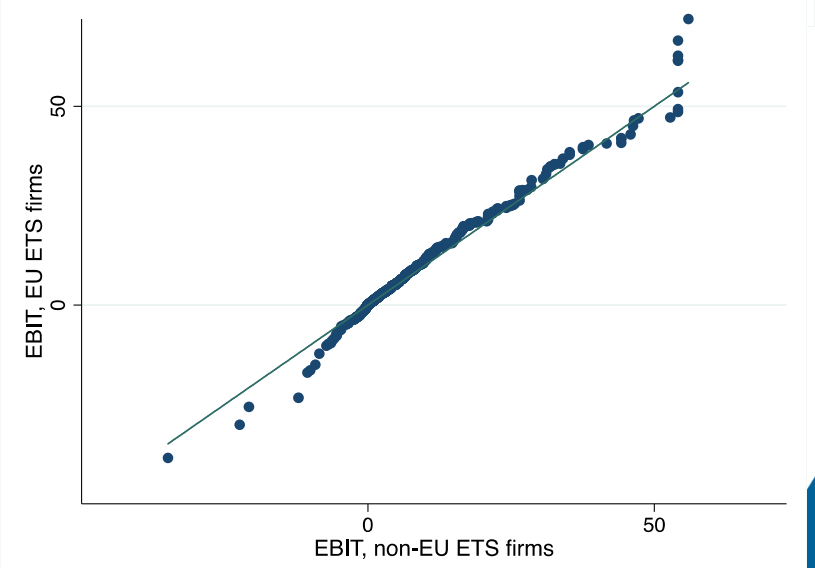
- Matching on:
  - Country
  - Sector
  - Turnover, fixed assets, employment and profit before 2005
- Good comparators for 1,787 EU ETS firms
  - Pre-2005 data not always available
  - No comparators for very large firms

# A good control group



# Summary of results

| Outcome variable | Effect |
|---|---|
| Employment | +2% (not significant) |
| Profits | +280k€ (not significant) |
| Revenue | +8-16%*** |
| Fixed assets | +6-8%*** |

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# Explanations

- Revenue
  - Cost pass-through with free allowances can only explain 10-20% of the effect
  - Effect in many sectors (not only electricity)
  - Productivity improvements?
- Assets
  - Strong effect for firms that reduced emissions the most, but not only
  - Energy-efficiency investments, but other investments as well

# Conclusion

- The EU ETS seems to have:
  - Modestly reduced emissions, with no evidence of leakage
  - While improving firms' performance
  - Incentivized investment
- The big questions
  - What are the mechanisms?
  - What if the price had been much higher?

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