

Even the announcement matters? The effect of CBAM on exports and exporters

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- The EU's Carbon Border Adjustment Mechanism (CBAM) is designed to ensure a fair price for the carbon emissions embedded in imported carbon-intensive goods while promoting cleaner industrial production outside the EU.
- It aims to prevent carbon leakage by ensuring that imported goods face carbon costs equivalent to those incurred by EU producers.
- This mechanism is aligned with the EU Emissions Trading System (ETS) and is part of the European Green Deal.

CBAM Timeline I

2019 – European Green Deal

- Sets path for EU climate neutrality by 2050

2021 – Fit for 55 Package

- Includes CBAM to prevent carbon leakage and level the playing field

Oct 2023 – Dec 2025: Transitional Phase

- Importers report embedded emissions
- No payments required
- Applies to: Cement, iron steel, aluminum, fertilizers, electricity, hydrogen

From Jan 2026: Financial Phase Begins

- Importers must buy CBAM certificates
- Adjusted for carbon prices paid in the country of origin

2026–2034: Phase-out of Free Allowances

- Gradual removal of free EU ETS allowances for CBAM sectors
- Full alignment with EU carbon pricing by 2034

Why CBAM Matters

- High Exposure to the EU Market
- High carbon-intensive exports: Steel, aluminum, cement, fertilizers
- In a high-price scenario of €150/tCO₂e, costs could escalate to €2.5 billion per year by 2032.

Aim

This paper aims to investigate the impact of the 2021 announcement of the Carbon Border Adjustment Mechanism on firms' export behavior, credit utilization, and investment decisions.

We use different datasets for the period 2019-2023:

- Export Analyses
 - Administrative monthly Trade dataset provided by TurkStat
 - Industry and Service Statistics collected by TurkStat to obtain industry and province information
- Credit and Investment Analysis
 - Balance sheet data provided by Enterprise Information System (EIS).
 - Firm registry data provided by EIS

Identification - Impact on exports

- We estimate the equation below to see the export impact of CBAM using monthly data:

$$\ln(y_{ft}) = \alpha + \beta \text{exposure}_f \times D_{\text{month} > \text{June}, 2021} + D_f + D_t + D_{kt} + D_{pt} + \varepsilon_{ft}$$

- $\text{exposure}_f = \frac{\text{total CBAM exports to EU by firm } f}{\text{total exports by firm } f}$ where CBAM exports are the goods of exports listed in the 2021 announcement.
- Outcome y_{ft} :
 - CBAM exports to EU (or non-EU)
 - Weighted CBAM price to EU (or non-EU)
 - Number of CBAM products to EU (or non-EU)
 - Number of CBAM export destinations in EU (or non-EU)
- *Fixed effects*: firm, time (year x month), industry \times time and province \times time

Identification - Impact on credit and investment

- We estimate the equation below to see the investment and credit impact of CBAM using yearly data:

$$\ln(y_{ft}) = \alpha + \beta \text{exposure}_f \times D_{\text{year} > 2021} + D_f + D_t + D_{kt} + D_{pt} + \varepsilon_{ft}$$

- Outcome y_{ft} :
 - Total credit
 - Investment ratio (defined as 1. log change in machinery and equipment, 2. change in real machinery and equipment divided by real sales)

Results– impact on exports value and number of products

| | (1) | (2) | (3) | (4) |
|--|--------------------------|------------------------------|----------------------------------|--------------------------------------|
| Dependent Variable: | Exports of CBAM to EU | Exports of CBAM to non-EU | Number of CBAM products to EU | Number of CBAM products to non-EU |
| $\text{exposure}_f \times D_{\text{date} > \text{June}, 2021}$ | -0.9618*** (0.1390) | 0.8175*** (0.1290) | -0.0848*** (0.0130) | 0.0935*** (0.0260) |
| <i>Fixed effects</i> | | | | |
| Firm | Yes | Yes | Yes | Yes |
| Time | Yes | Yes | Yes | Yes |
| Industry \times time | Yes | Yes | Yes | Yes |
| Province \times time | Yes | Yes | Yes | Yes |
| <i>Fit statistics</i> | | | | |
| Observations | 2,473,105 | 2,473,105 | 2,473,105 | 2,473,105 |
| R ² | 0.703 | 0.1943 | 0.5880 | 0.7750 |

Results– impact on number of destinations

| | (1) | (2) |
|---|--|--|
| Dependent Variable: | Number of EU countries CBAM-covered products sold | Number of non-EU countries CBAM-covered products sold |
| $\text{exposure}_f \times D_{\text{date} > \text{Jul}, 2021}$ | -0.0578*** (0.0140) | 0.0453*** (0.0130) |
| <i>Fixed effects</i> | | |
| Firm | Yes | Yes |
| Time | Yes | Yes |
| Industry \times time | Yes | Yes |
| Province \times time | Yes | Yes |
| <i>Fit statistics</i> | | |
| Observations | 2,473,105 | 2,473,105 |
| R ² | 0.739 | 0.742 |

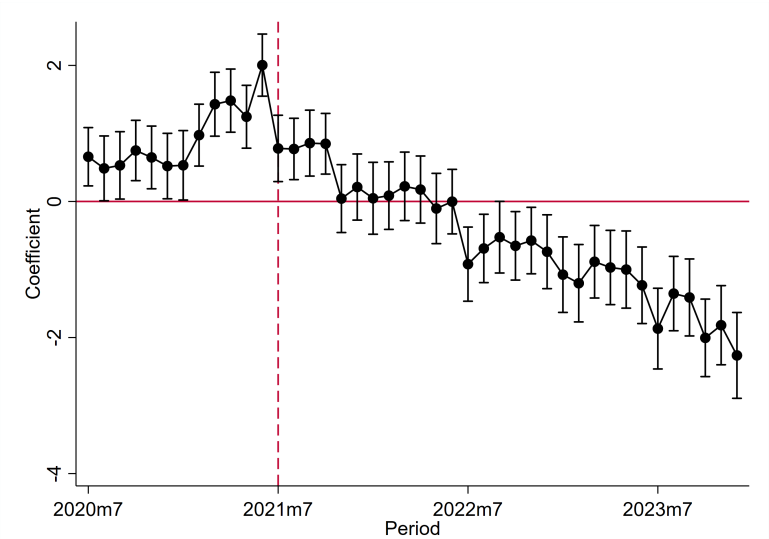
Results– impact on prices

| | (1) | (2) |
|--|-------------------------------|-----------------------------------|
| Dependent Variable: | Weighted export price (EU) | Weighted export price (non-EU) |
| $\text{exposure}_f \times D_{\text{date} > \text{June}, 2021}$ | -0.0074 (0.0220) | 0.0367 (0.0240) |
| <i>Fixed effects</i> | | |
| Firm | Yes | Yes |
| Time | Yes | Yes |
| Industry \times time | Yes | Yes |
| Province \times time | Yes | Yes |
| <i>Fit statistics</i> | | |
| Observations | 90,361 | 183,532 |
| R ² | 0.820 | 0.785 |

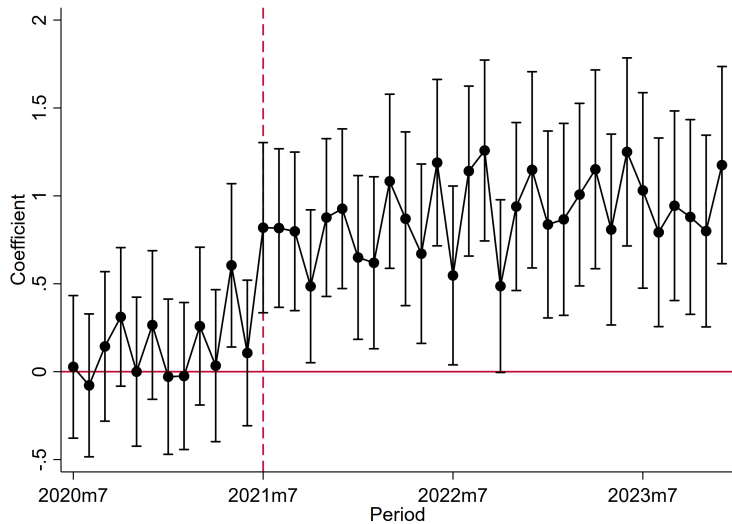
Results– impact on investment and credit

| | (1) | (2) | (3) |
|---|-----------------------|---|--------------------|
| Dependent Variable: | Investment ratio | Investment ratio in machinery & equip. | Total credit |
| $\text{exposure}_f \times D_{\text{year} > 2021}$ | 0.0086*** (0.0030) | 0.2602** (0.1050) | 0.2579 (0.2070) |
| <i>Fixed effects</i> | | | |
| Firm | Yes | Yes | Yes |
| Year | Yes | Yes | Yes |
| Industry \times year | Yes | Yes | Yes |
| Province \times year | Yes | Yes | Yes |
| <i>Fit statistics</i> | | | |
| Observations | 448,770 | 476,377 | 703,516 |
| R ² | 0.370 | 0.239 | 0.786 |

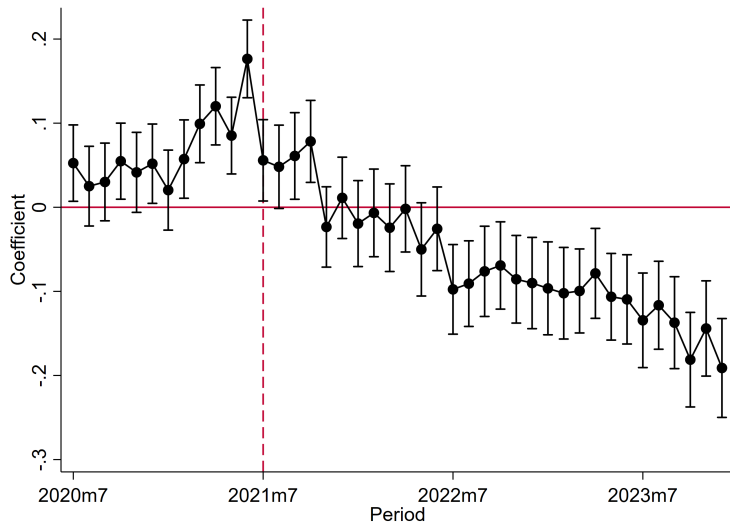
Event study- CBAM exports to EU



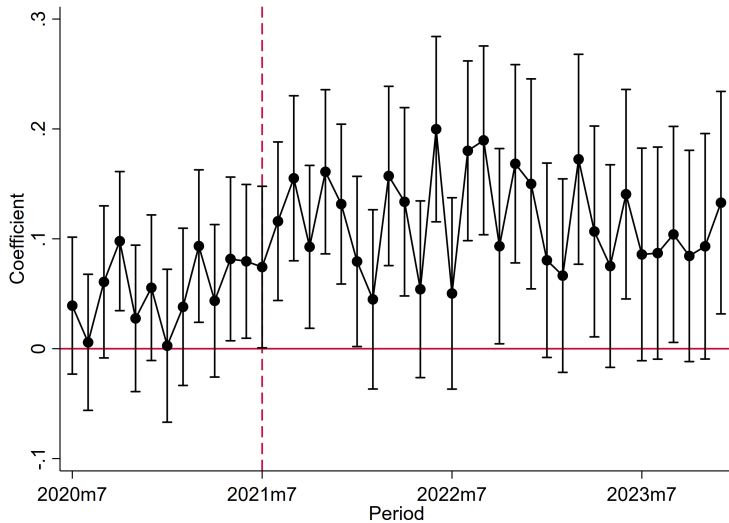
Event study- CBAM exports to non-EU



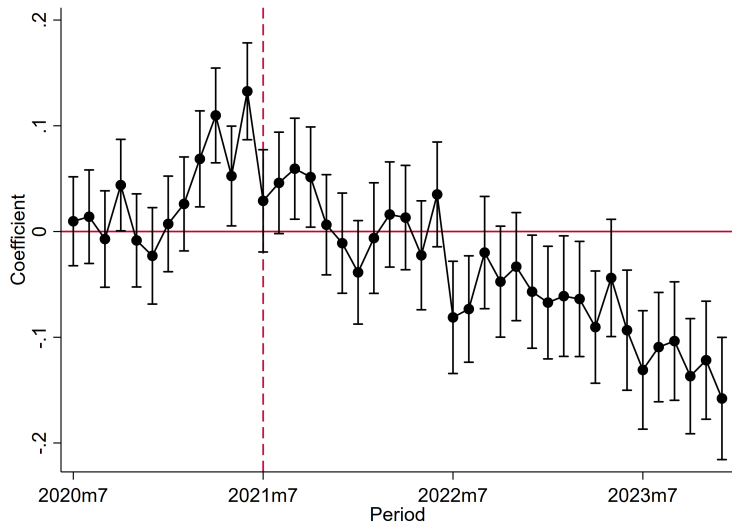
Event study- number of CBAM products to EU



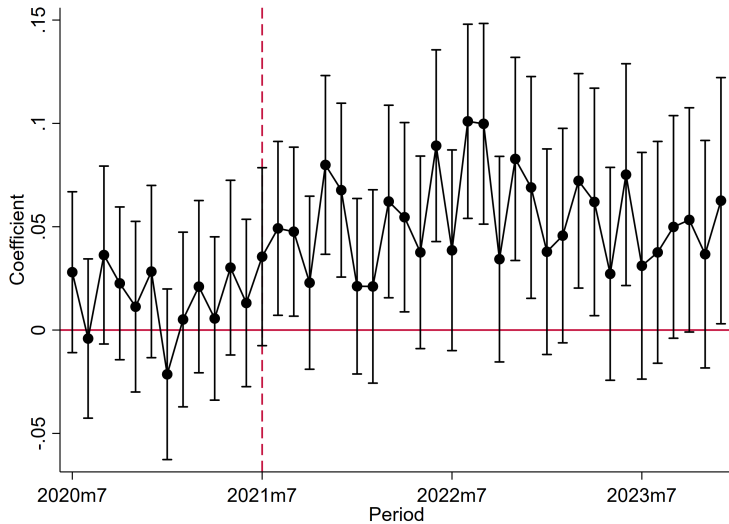
Event study- number of CBAM products to non-EU



Event study- number of CBAM countries in EU



Event study- number of CBAM countries in non-EU



Conclusion

- Following the announcement, firms with higher CBAM exposure experienced a decline in exports of CBAM-covered products to EU countries, accompanied by an increase in exports to non-EU markets, indicating evidence of export market switching.
- A similar pattern is observed in both the number of CBAM-covered products exported and the diversity of their destination markets.
- No effect is observed in export prices of CBAM-covered products for both EU and non-EU countries.
- Following the announcement, firms with higher CBAM exposure increased their investment.
- Market switching takes time.

Next steps

Firm Heterogeneity

- Firm size
- Productivity
- Credit constraint
- Switcher vs. non-switcher firms

Effect of the announcement on the import of the goods used for decreasing carbon emissions.