

Cross-border carbon taxes and shareholder wealth

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Part A: Background Information on the CBAM

In this Appendix, we provide a detailed background information on the CBAM.¹

A.1 General Information

The Carbon Border Adjustment Mechanism (CBAM) was formally approved as Regulation EU 2023/956 of the European Parliament and of the Council on April 18, 2023. The CBAM aims to address the risk of carbon leakage, which occurs when firms transfer production or supply chains for carbon intensive goods to countries with less stringent climate policies. It will impact goods imported from outside the European Union into any of its 27 member countries as well as Switzerland and Norway (collectively referred to as the “EU” herein).² The CBAM is intended to level the playing field between EU and non-EU producers by ensuring that a specified list of carbon intensive goods imported to the EU are subject to similar carbon pricing as if they were produced within the EU. Importers of covered goods will be required to provide third party verified reports of imported embedded carbon emissions quarterly. They will also need to purchase CBAM certificates quarterly and surrender certificates annually to cover the balance of emissions imported during the year.

A.2 Ex-Ante State of Carbon Pricing and Carbon Leakage in the EU from the EU ETS

The EU has historically enforced carbon pricing through the EU Emission Trading System (“EU ETS”). The EU ETS launched in 2005 and today covers emission intensive industries such as power and heat generation, energy intensive manufacturing, aviation within the EU (since 2013) and marine transport (since 2024). These covered industries are responsible for around 40% of EU greenhouse gas (“GHG”) emissions. The EU ETS is organized following a cap-and-trade principle. Firms with operations covered by the system are required to track GHG emissions, submit verified emission reports and surrender emission allowances to offset their emissions. Within the EU ETS, one emission allowance (commonly referred to as an “EUA” or just “allowance”) represents the right to emit one ton of carbon dioxide equivalent in GHG per period. Each year, the EU specifies a cap on the total number of allowances issued and permits trading of allowances via a primary auction market and various secondary markets (spot market, brokered transactions, derivatives market). This trading facilitates discovery of a price for such allowances and hence, a price for emissions. The annual cap on allowances is set to achieve targeted reductions in emissions within the system over time.

The CBAM is designed to complement and reinforce the EU ETS and even replace certain aspects of the EU ETS. Many features of the CBAM regulation are based on the structure and methodologies of the EU ETS to help ensure harmony and equal treatment for goods produced within the EU with those imported from outside the EU. Carbon leakage has been a significant challenge for the EU ETS (e.g., Naegele and Zaklan 2019, Borghesi et al. 2020, Dechezleprêtre et al. 2022). To mitigate leakage, the EU ETS has provided a substantial portion of allowances for free to industries most at risk of relocating their production outside the EU. This helps reduce the cost burden on these industries of the EU ETS while still incentivizing emissions reductions. The CBAM is intended to replace this free allowance mechanism. The CBAM phases in while the allocation of free allowances phases out starting in 2026. The goal is to eliminate free allowances by 2034 and to ensure that EU ETS goods are not treated more favorably than CBAM imported goods.

¹ For more information, see, also, https://taxation-customs.ec.europa.eu/carbon-border-adjustment-mechanism_en and https://climate.ec.europa.eu/eu-action/eu-emissions-trading-system-eu-ets_en.

² While Switzerland and Norway are not member countries of the EU, they have agreements with the EU regarding the EU Emission Trading System and the CBAM, effectively treating Swiss and Norwegian firms as European Union firms in this context.

A.3 CBAM as a Carbon Tax

In contrast to the cap-and-trade principle of the EU ETS, the CBAM functions more like a tax. It does not establish a cap on emissions for imports, but rather imposes a price on the embedded emissions in imported goods whatever the volume of imports. To impose a price, the CBAM will require importers to purchase a CBAM certificate for each ton of embedded emissions imported (measured in CO₂ equivalents). The CBAM will explicitly define the price for certificates instead of following the EU ETS methodology of using a market mechanism to discover a price for emissions. Specifically, CBAM certificate prices will be calculated and published on a weekly basis using the average closing auction price for EU ETS allowances per ton of CO₂ in the preceding week. This will help ensure alignment in carbon pricing across the two systems.

Importers must hold at the end of each quarter CBAM certificates equal to at least 80% of the embedded emissions imported since the beginning of the calendar year. Additionally, after the end of the calendar year, an importing firm will have until May 31 of the following year to surrender CBAM certificates equivalent to the emissions embedded in CBAM goods imported during the year. Importers are allowed to claim a reduction in CBAM certificates that corresponds to the carbon price already paid for the embedded emissions in country of origin. However, rebates above the CBAM prices are not provided in the case that origin country carbon prices exceed those of the CBAM certificates.

The CBAM does not allow secondary market trading of CBAM certificates and any certificates purchased in the previous calendar year that remain on a firm's books at July 1 of the following year will be cancelled. This is in contrast to the treatment of allowances created for the EU ETS. EU ETS allowances typically do not expire and can be carried over into future periods or sold in the secondary market. The limitations for CBAM certificates help ensure that the price of emissions for imported goods remains directly tied to the EU ETS pricing, preventing speculative trading in CBAM certificates that could lead to price volatility and distortions across the EU ETS and CBAM. The CBAM does, however, include a limited repurchase mechanism for firms with excess certificates. Firms with an excess following the May 31 surrender date may request to sell excess CBAM certificates back to their national authority at the purchase price. Such repurchases are limited to one third of the volume of certificates purchased during the previous calendar year. Requests for repurchases must be submitted by June 30 of the following year.

A.4 Scope of the CBAM

Initially, the CBAM will apply to goods from six sectors: iron and steel, cement, aluminum, fertilizers, hydrogen and electricity generation. To determine whether a good is covered by CBAM, an importer needs to check whether the imported good is listed on the Combined Nomenclature (CN) list specified in Annex II of the EU CBAM implementing regulation (Commission Implementing Regulation (EU) 2023/1773). The initial sectors represent a subset of the sectors covered by the EU ETS to allow for a more manageable and targeted implementation during the initial phases of the CBAM. Sectors were selected focusing on industries most vulnerable to carbon leakage and those with the highest emissions intensity.³

There is a de minimis exemption from reporting when the total value of CBAM goods in a consignment is below 150 EUR in value. Additionally, CBAM goods are eligible to be placed under the inward processing regime of the EU. The inward processing regime is a customs procedure that allows businesses to import goods into the EU for processing without paying customs duties and other taxes. These goods can be processed, transformed and then either re-exported out of the EU or released for free circulation within the EU, with duties and taxes applicable only upon the release for free circulation. Importers of CBAM goods placed under the

³ This targeted approach allows the EU to address the most pressing areas first, while gathering data and experience for potential future expansion. The CBAM is expected to eventually cover all goods and sectors covered by the EU ETS. Goods more exposed to carbon leakage will continue to be prioritized for earlier inclusion, but a tentative target of harmonizing the coverage of sectors and goods across the CBAM and EU ETS has been set for 2030.

inward processing regime must still report embedded emissions and if the goods are released for free circulation within the EU, CBAM certificates must be purchased and surrendered for the goods.

A.5 Measurement and Reporting of Embedded Emissions

Firms importing CBAM covered goods are required to submit a report on a quarterly basis that includes information on the quantity of CBAM goods imported, total embedded emissions, total indirect emissions and details of any carbon prices already paid in the producing countries for the goods. Reports are required to be submitted within one month of the quarter end. Importers will be required to have their embedded emission reports verified by an EU-accredited agency following a similar set of verification methodologies and principles as used in the EU ETS verification process. As specified in Article 14 of the CBAM Regulation, the content of reports will remain confidential, except for the names, addresses, and contact details of operators and the locations of installations.

The calculation of emissions covered by the CBAM can vary dependent on the CBAM good being imported. However, generally covered emissions include direct emissions generated from the production of CBAM goods. Additionally, upstream Scope 2 emissions related to the electricity consumed in the production of CBAM goods are generally included. Upstream Scope 3 emissions associated with CBAM goods used as input materials for the imported good are also generally included. CBAM goods that use other CBAM goods as inputs are referred to as complex goods. Other upstream Scope 3 emissions, such as those related to raw materials, transportation and distribution, and waste, are generally not included. Furthermore, downstream Scope 3 emissions associated with the consumption, transportation, distribution, and end-of-life of a good are not covered by the CBAM.

Firms should measure emissions using either a calculation-based methodology or a measurement-based methodology. Broadly speaking, calculation-based methodologies consider the quantities of fuels and input materials consumed, using information on the carbon content, calorific value, and/or emission factors of each to calculate emissions. In contrast, a measurement-based methodology typically involves using a monitoring system that directly measures and tracks GHG emissions produced during the production process.

During 2024, a variety of other monitoring and reporting methodologies will be permitted. These include using reporting for carbon pricing or monitoring emissions from the producer's country, the use of default values, and the estimation of emissions for complex goods, for up to 20% of total embedded emissions. It is not expected that these alternative reporting methods are allowed after 2024.

A.6 Responsible Party for CBAM Covered Imports

The importer of the goods (also known as the reporting declarant) is the party responsible for reporting emissions and purchasing and surrendering CBAM certificates. In cases where a direct customs representative is appointed by a firm importing goods, the firm remains the responsible reporting declarant. Appointing a direct customs representative typically requires a formal legal relationship between the firm and the representative, allowing the representative to operate in the name and on behalf of the firm but allowing the firm to retain the rights and obligations related to customs procedures. In contrast, if an indirect customs representative is utilized, the representative becomes the importer of record and assumes the responsibility of the reporting declarant. In this scenario, the representative acts in their own name and holds the rights and obligations concerning customs procedures. This arrangement is typically employed when an importing firm does not have a physical presence within the EU and must instead rely on an indirect customs representative to operate where the foreign firm is not able to.

A.7 Implementation Phases

The CBAM will be implemented in two phases, the transitional phase and the definitive phase. On October

1, 2023, the CBAM started the transitional phase, which extended through the end of 2025. During this phase, importers needed to report the emissions embedded in imported CBAM goods but were not yet required to purchase CBAM certificates or provide verified emission reports. This phase aimed to gather data and allowed learning by importers, foreign firms and regulators to help facilitate a smooth transition. Reports during the transitional period were to be filed quarterly with the first reporting for Q4 of 2023 due by January 31, 2024. During the transition period penalties could be enforced on firms for failing to submit a CBAM report or for submitting an incomplete or inaccurate CBAM report and not taking the appropriate action to resolve identified issues. These penalties can range between EUR 10 and EUR 50 per ton of unreported emissions.

During the definitive phase, which started January 1, 2026, importers are required to submit copies of verification reports from accredited verifiers and to purchase and surrender CBAM certificates. CBAM certificate purchasing requirements will be gradually phased in linked to the phasing out of free allowances in the EU ETS so that imported and EU produced goods pay a similar carbon price across the definitive phase. During the definitive phase, penalties for noncompliance increase and CBAM declarants that fail to surrender the necessary number of CBAM certificates by May 31 of the following year will incur fines equal to those under the EU ETS, meaning €100 for each ton of CO₂ with an adjustment for inflation. Also, similar to the EU ETS, paying a fine does not settle the obligation to surrender CBAM certificates and firms will be required to surrender certificates for any uncovered imported emission amounts in the following year. The importing of CBAM covered goods is only permitted by registered declarants. If unregistered declarants import CBAM covered goods they will face higher penalties than the ones listed above.

A.8 Monitoring, Verification and Administration

The European Commission will complete monitoring and conduct activities like cross-referencing firm reports with the information that is required to be reported by customs authorities for imports of covered goods. The European Commission refers any suspicious cases to the member states for additional investigation and potential enforcement action. The European Commission will also manage the CBAM Transitional Registry and establish the Common Central Platform, which will facilitate the sale and repurchase of certificates during the definitive period of the CBAM. It will also monitor the implementation of the CBAM more broadly to assess progress, identify risks of circumvention, and analyze the impact of the CBAM on exports, downstream products, trade flows, and least developed countries. Finally, the Commission will also prepare secondary legislation in the form of implementing and delegated acts to support the CBAM framework.

Each country in the EU designates a national competent authority that conducts monitoring and administration functions for the CBAM. National competent authorities have the responsibility for examining suspicious cases identified by the European Commission and can impose penalties. Other important duties include certifying qualified verification providers for embedded emission reports and reviewing verified emission reports submitted by importers in that country. The national competent authorities also verify quarterly that importers hold sufficient CBAM certificates to meet the 80% coverage requirement.

Part B: Producers and Purchasers of CBAM Products

Panel A summarizes GSUBINDs that correspond to five of the six sectors targeted by the CBAM: aluminum, cement, electricity, fertilizers, and iron and steel. We do not include the hydrogen sector in our analysis because we are not able to identify subindustry codes related to hydrogen. Panel B summarizes GSUBINDs where at least 40% of the firms in the industry group have an identifiable supply chain link to a producer of CBAM products. This percentage is referred to as *CBAM Link%*.

Panel A. Producers of CBAM Products		
CBAM Sector	GSUBIND	Name
Aluminum	15104010	Aluminum
Cement	15102010	Construction Materials
Electricity	55101010	Electric Utilities
	55105010	Independent Power Producers & Energy Traders
Fertilizers	15101030	Fertilizers & Agricultural Chemicals
	15101010	Commodity Chemicals
Iron & Steel	15104020	Diversified Metals & Mining
	15104050	Steel

Panel B. Purchasers of CBAM Products			
Industry Group	GSUBIND	Name	CBAM Link%.
Energy	10102010	Integrated Oil & Gas	89%
	10102030	Oil & Gas Refining & Marketing	55%
	10102040	Oil & Gas Storage & Transportation	50%
	10102050	Coal & Consumable Fuels	85%
Materials	15101010	Commodity Chemicals	83%
	15101020	Diversified Chemicals	92%
	15101030	Fertilizers & Agricultural Chemicals	81%
	15101040	Industrial Gases	82%
	15101050	Specialty Chemicals	81%
	15102010	Construction Materials	90%
	15103010	Metal, Glass & Plastic Containers	87%
	15103020	Paper & Plastic Packaging Products & Materials	83%
	15104010	Aluminum	92%
	15104020	Diversified Metals & Mining	94%
	15104025	Copper	92%
	15104030	Gold	87%
	15104040	Precious Metals & Minerals	92%
	15104045	Silver	92%
	15104050	Steel	96%
	15105010	Forest Products	72%
	15105020	Paper Products	70%
Capital Goods	20101010	Aerospace & Defense	60%
	20102010	Building Products	64%
	20103010	Construction & Engineering	63%
	20104010	Electrical Components & Equipment	61%
	20104020	Heavy Electrical Equipment	75%
	20105010	Industrial Conglomerates	70%
	20106010	Construction Machinery & Transport Equipment	62%
	20106015	Agricultural & Farm Machinery	75%
	20106020	Industrial Machinery	55%
	20107010	Trading Companies & Distributors	57%
Transportation	20303010	Marine Transportation	56%
	20305030	Transportation Infrastructure	42%
(Continued)			

Panel B. Purchasers (Continued)

Industry Group	GSUBIND	Name	CBAM Link%.
Automobiles	25101010	Automotive Parts & Equipment	69%
	25101020	Tires & Rubber	100%
	25102010	Automobile Manufacturers	76%
Consumer Durables	25102020	Motorcycle Manufacturers	64%
	25201030	Homebuilding	60%
	25201040	Household Appliances	65%
	25201050	Housewares & Specialties	50%
	25203020	Footwear	44%
Retail	25203030	Textiles	79%
	25504030	Home Improvement Retail	58%
	30201010	Brewers	41%
Food & Beverage	30201030	Soft Drinks & Non-alcoholic Beverages	48%
	30202010	Agricultural Products & Services	53%
	30301010	Household Products	71%
Household Products	35101020	Health Care Equipment & Supplies	41%
Healthcare	45203015	Electronic Components	51%
Tech Equipment	55101010	Electric Utilities	80%
Utilities	55102010	Gas Utilities	77%
	55103010	Multi-Utilities	80%
	55104010	Water Utilities	40%
	55105010	Indep. Power Producers & Energy Traders	60%
	55105020	Renewable Electricity	47%
Real Estate	60108010	Other Specialized REITs	50%
	60108030	Telecom Tower REITs	50%
	60108040	Timber REITs	50%
	60108050	Data Center REITs	50%
	60201010	Diversified Real Estate Activities	41%
	60201030	Real Estate Development	49%
	60201040	Real Estate Services	40%

Part C: Information on Calculating the Implied Cost of Carbon

In this Part C of the Online Appendix, we explain our approach to calculating the implied cost of carbon in our setting. In general, estimating an “implied carbon price” is inherently challenging for several reasons. First, the CBAM can negatively affect the expected future cash flows of EU Purchasers through multiple channels, including: (i) payments for imported emissions (net of portions passed on to suppliers or downstream customers); (ii) compliance, verification, and reporting costs, which may arise directly at the EU firm or be passed on from upstream non-EU exporters;⁴ (iii) restructuring costs, such as those associated with supply chain reorganization or internal investments to adapt operations; (iv) the loss of free allowances under the EU ETS; and (v) broader negative real effects, such as reduced investment within the EU or wider negative wealth effects across the EU economy. In addition, the CBAM could influence cash flows if governments use certificate revenues to finance investment incentives aimed at supporting firms’ decarbonization efforts. Finally, the CBAM may also affect market valuations through changes in discount rates. If the CBAM increases uncertainty for EU importers of CBAM products—leading to upward revisions in discount rates or the cost of capital—the observed negative stock price reaction would capture not only a “numerator” effect (via lower expected cash flows) but also a “denominator” effect through a higher discount rate.

Keeping this comprehensive cost structure in mind, we proceed as follows: We start by estimating emissions over a 30-year period following the event dates consistent with the EUs net zero by 2050 target. The low end of the range assumes no emissions reductions from 2019 levels. The high end of the range assumes annual reductions in line with the EU ETS emissions reduction factor at the time of the CBAM event dates (2.2% annual reduction). We use average 2019 Trucost upstream first tier indirect emissions as the reference starting emissions. First-tier indirect emissions are defined as GHG Protocol scope 2 emissions, plus the company’s first-tier upstream supply chain. We then make a further assumption that approximately 10% of such emissions on average would be subject to CBAM pricing over the next 30 years. By comparison, the EC estimated in 2019 that 36% of the EU GHG emissions originated from outside of the EU (see https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Main_Page). The CBAM targets scaling to eventually impose a carbon price on 99% of imported emissions.

We use the difference in negative reaction from Table 4, column 2 of 1.7% applied to the average 2019 market capitalization of *EU Purchasers with Non-EU suppliers* to estimate the numerator in our calculation. This implicitly assumes that the portion of the negative reaction experienced by both EU Importers with and without non-EU suppliers reflects other negative cashflow and risk impacts not directly related to future payments for imported emissions. Because the market reaction already incorporates expectations of the present value of impacts to future cash flows, no additional discounting is required.

Exhibit A.1 below presents a sensitivity analysis of our computation of the implied cost of carbon. We redo the analysis for alternative values of decarbonization rates, percentages of First-tier indirect emissions subject to CBAM pricing, and effect sizes.

⁴ These compliance costs do not only occur directly at the European firms, but also at non-EU firms that export to the EU. In our conversations with several industrial companies, compliance costs emerged as a key concern, particularly those incurred by non-EU suppliers. Our anecdotal evidence also suggests that these costs are often passed on to EU importers. For example, one CFO of a European firm said that the verification and documentation system that is required for CBAM and that needs to be implemented in the non-EU firm (in their case, in Turkey) is expensive and their supplier passes on these costs to them.

Exhibit A.1. Sensitivity Analysis of the Computation of Implied Cost of Carbon

1.7% Negative Reaction		Annual Decarbonization over 30 yr period		
		0.0%	-2.2%	-4.4%
NonEU CBAM % of 2019 Upstream First Tier Indirect Emissions	10.0%	28.90	42.82	61.65
	15.0%	19.27	28.54	41.10
	20.0%	14.45	21.41	30.83
	25.0%	11.56	17.13	24.66
	30.0%	9.63	14.27	20.55
	35.0%	8.26	12.23	17.62
	40.0%	7.22	10.70	15.41

3.3% Negative Reaction		Annual Decarbonization over 30 yr period		
		0.0%	-2.2%	-4.4%
NonEU CBAM % of 2019 Upstream First Tier Indirect Emissions	10.0%	56.10	83.11	119.68
	15.0%	37.40	55.41	79.79
	20.0%	28.05	41.56	59.84
	25.0%	22.44	33.24	47.87
	30.0%	18.70	27.70	39.89
	35.0%	16.03	23.75	34.19
	40.0%	14.02	20.78	29.92

Figure A.1: Timeline of Google Search Trends

This figure presents the interest in the CBAM based on Google Search Trends over the period 2019 to 2023. Based on Google, “numbers represent search interest relative to the highest point on the chart for the given region and time. A value of 100 is the peak popularity for the term. A value of 50 means that the term is half as popular. A score of 0 means there was not enough data for this term.” The search terms are “EU CBAM” (solid line) and “carbon border adjustment mechanism” (dashed line) worldwide. Vertical lines show the main CBAM regulatory events.

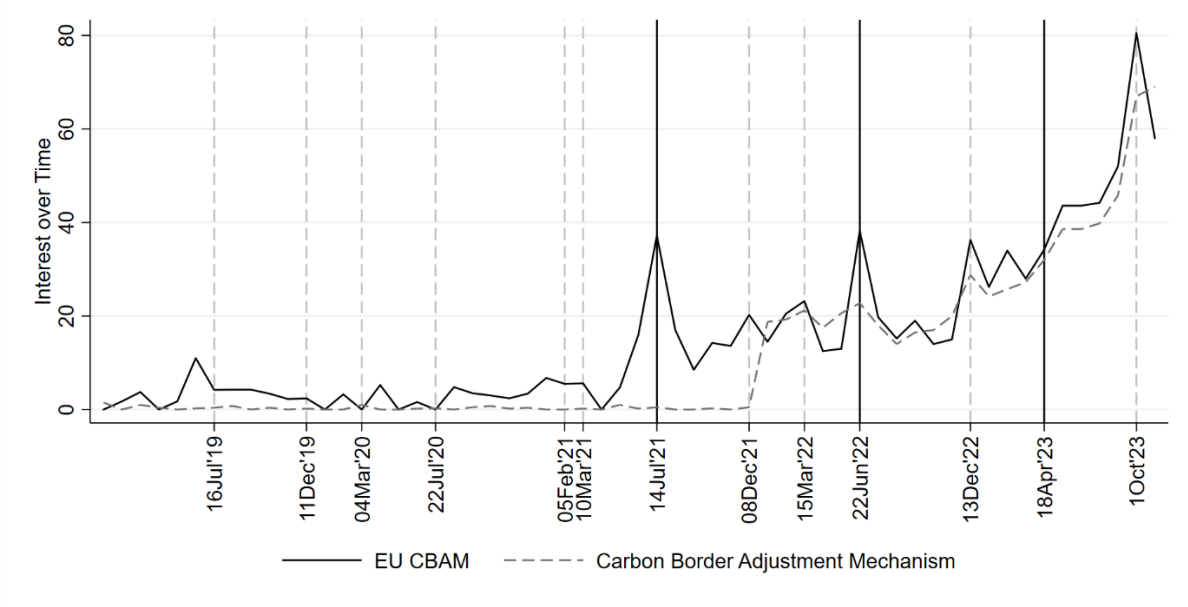


Figure A.2: Use of Uncertainty-related Words in Newspaper Articles

This figure presents the results of a tone analysis of media articles before and after the CBAM event dates with respect to uncertainty. Using the Loughran and McDonald (2011) dictionary of uncertainty-related words, we measure the *Number of Uncertainty Words* as the average count of uncertainty words per article and *Share of Uncertainty Words* as the average of the count of uncertainty words per article deflated by the total words per article.

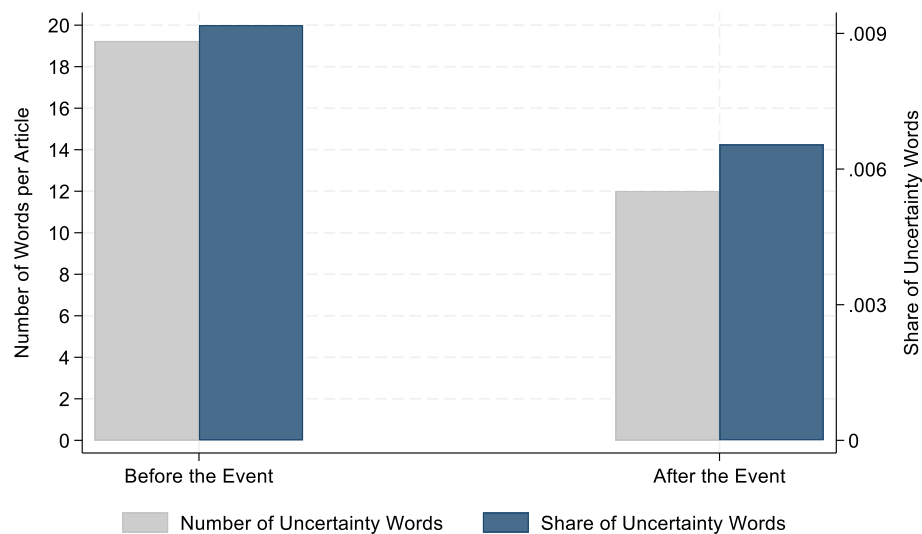


Figure A.3: Histogram of CARs

This figure plots the distribution of aggregate cumulative abnormal returns ($CAR(0,2)$) of EU Purchasers (black line) and non-EU Producers (gray line) around the three selected event dates (i.e., July 14, 2021, June 22, 2022, and April 18, 2023). See Appendix A for variable definitions.

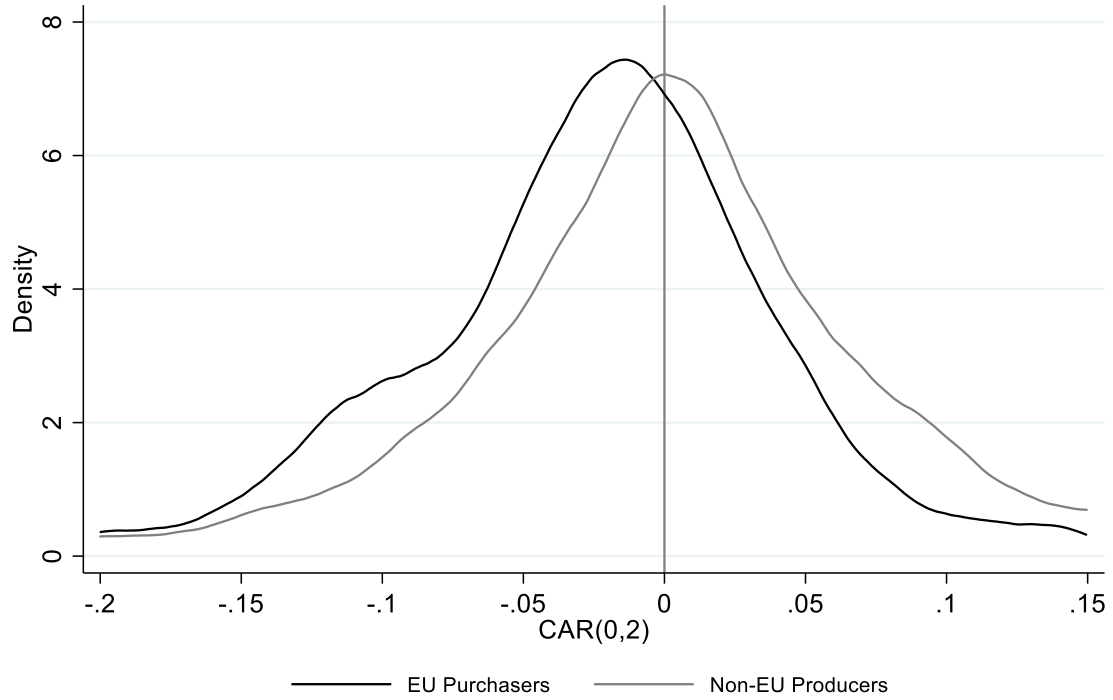


Figure A.4: CARs around CBAM Events by Country

These figures present the aggregated CAR(0,2) around CBAM events by country. The analysis distinguishes between EU Purchasers of CBAM products (Panel A) and Non-EU Producers of CBAM products (Panel B). In cases of relatively few observations by country, we group firms by geographic area. Dots represent the sample mean, while the thicker (thinner) line shows the 90% (95%) confidence intervals.

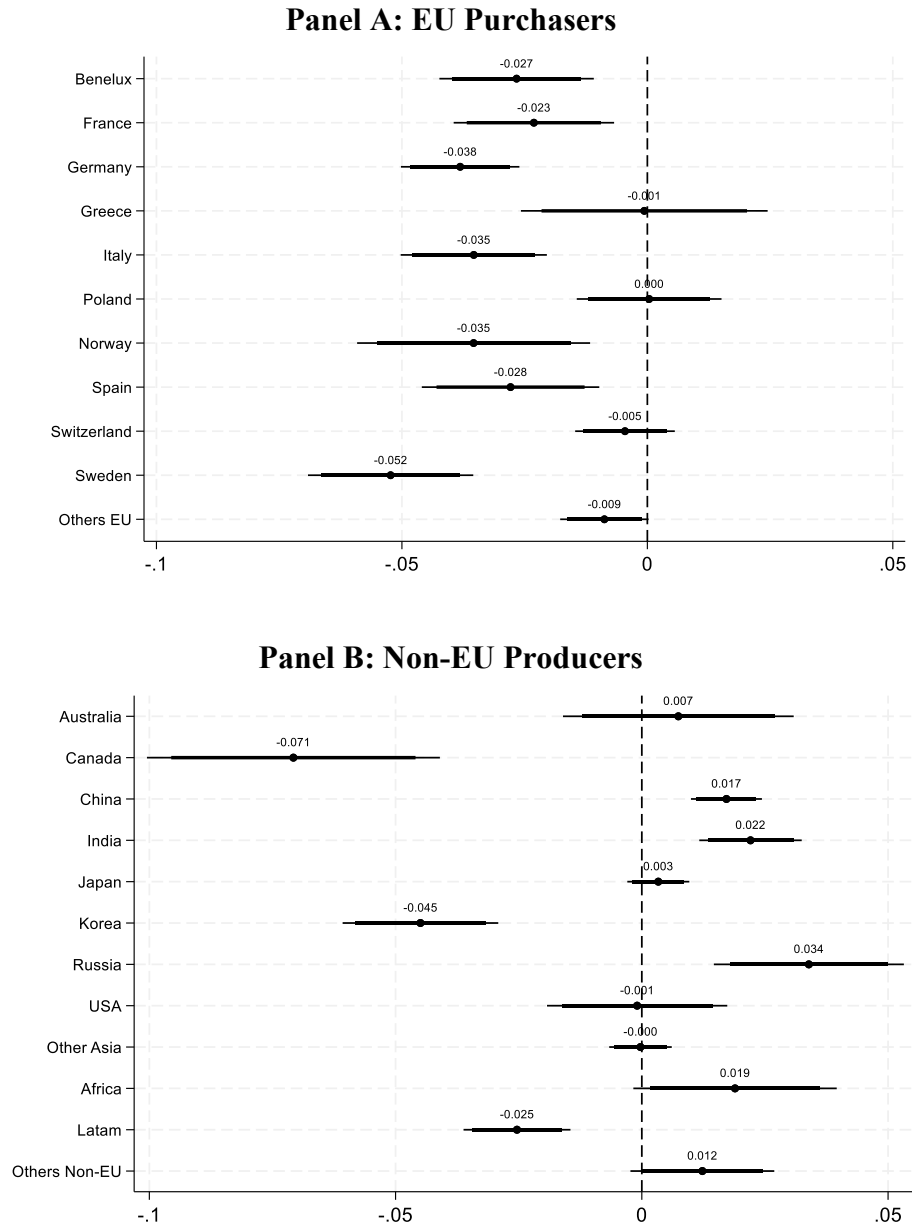
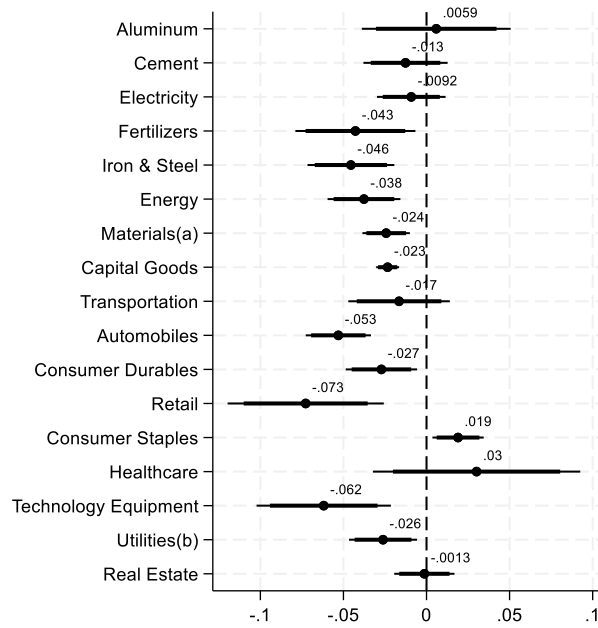


Figure A.5: CARs by Industries, CBAM firms

These figures present the aggregated CAR(0,2) around CBAM events by sector. Panel A presents the CARs for the EU Purchasers. Panel B presents the CARs by the five sectors of the Non-EU Producers. Dots represent the sample mean, while the thicker (thinner) line shows the 90% (95%) confidence intervals.

Panel A: EU Purchasers



(a) Materials excludes firms classified as Aluminum, Cement, Fertilizers and Iron & Steel.
(b) Utilities excludes firms classified as Electricity.

Panel B: Non-EU Producers

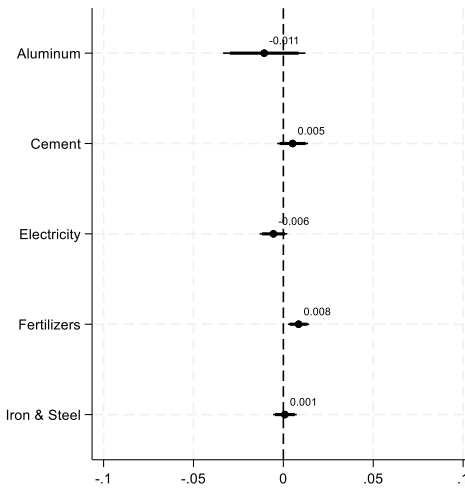


Figure A.6: Histogram of Import-Export Volumes

Panel A of this figure plots the country-industry dollar amounts of EU imports from non-EU CBAM producers. Panel B plots the dollar amounts of country-industry exports to the EU by non-EU producers of CBAM-covered goods. We include all countries and industries in the 2019 Input-Output Table with non-zero bilateral trading volume. Dollar values are reported in logarithm. The three vertical lines represent USD 50, 100, and 500 million country-industry specific trade volume, respectively. The industries that contain producers of CBAM-covered goods comprise the I/O code “B07_08” (Mining and quarrying, non-energy producing products), “C20” (Chemical and chemical products), “C23” (Other non-metallic mineral products), “C24” (Basic metals), and “D” (Electricity). The I/O codes are from OECD database.

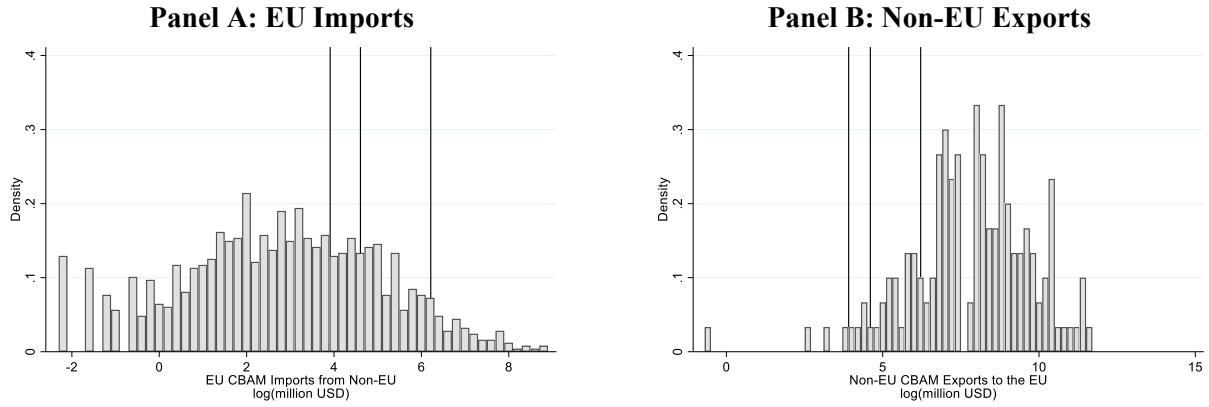


Figure A.7: Placebo Tests with Nonevent Dates

These figures show the results of a simulation based placebo test repeating the Table 4 analyses using nonevent dates over 1,000 simulation to construct a bootstrapped distribution of nonevent coefficients. In each simulation, we randomly select three event dates from our sample window (excluding dates where CARs would overlap with our selected event dates). For these three randomly selected dates, we calculate aggregate CARs (0,2), re-estimate equation (2) (i.e. Table 4 columns 1 and 2) and store the coefficients of interest from the regressions. Panel A summarizes the 1,000 coefficients for β_{EU} Purchaser (" β_{EU} ") from the Table 4 column 1 specification. Panel B summarizes the differences in coefficients between EU Purchasers with and without non-EU suppliers (" $Diff \beta$ ") from the Table 4 column 2 specification. See Appendix A for variable definitions. In both Panel A and B the black vertical line shows where the estimated coefficients from Table 4 fall within the simulated distribution. Panel C presents summary statistics for the proportion of simulations where coefficients are above or below the estimate coefficients from Table 4. Finally, Panel D repeats Panel C excluding any simulations that include a trading day in the first week of trading following the February 24, 2022 invasion of Ukraine by Russia.

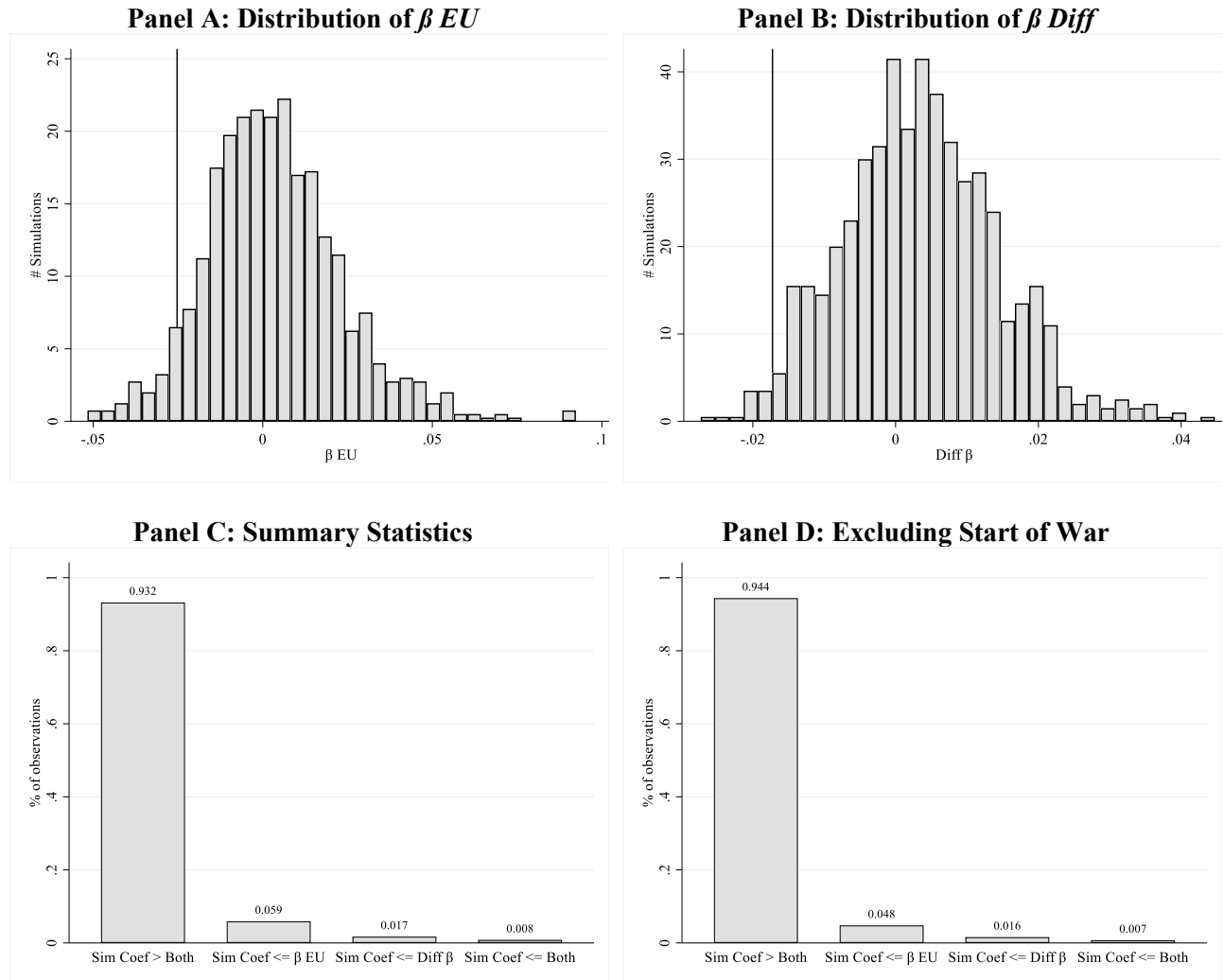


Figure A.8. Margins and industry concentration (HHI)

This figure illustrates the relation between margins and industry concentration for the sample of European Purchasers of CBAM products. The x-axis represents the HHI level of an industry using country-industry output data from the OECD input-output tables. The y-axis shows the distribution of profit margins within an industry. The box indicates the interquartile range from the 25th to 75th percentile.

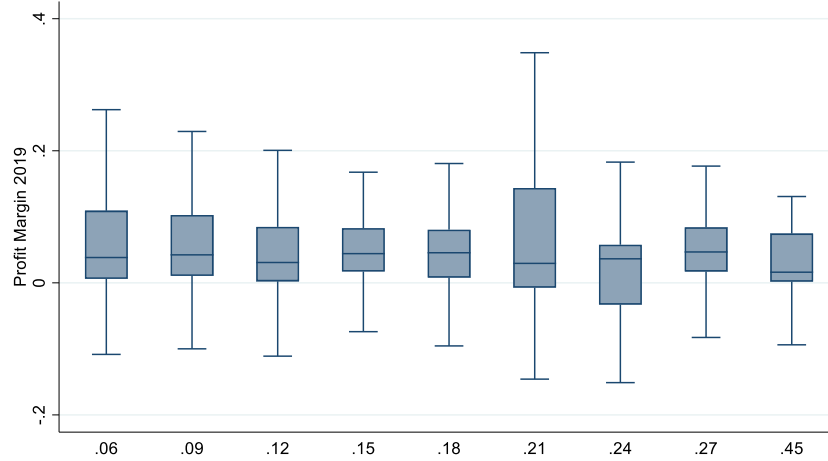


Figure A.9: Changes in Attention or Sensitivity to Climate

This figure plots results of an analysis of changes in Reprisk incidents following the 3 selected CBAM event dates. The figures plot the β_1 coefficient from a series of estimations of the following equation:

$$Reprisk_i = \alpha + \beta_1 EU\ Purchaser_i \times Post + \beta_2 EU\ Purchaser_i + \beta_3 Post + \varepsilon_i$$

$Reprisk_i$ is a count of incidents for firm i within a 30 calendar day window before or after a CBAM event date. We consider 8 different definitions of $Reprisk_i$ as indicated in the table legend. $Post$ is an indicator variable equal to 1 for $Reprisk_i$ from the 30 day window after the CBAM event date and 0 otherwise. $EU\ Purchaser_i$ is an indicator variable equal to 1 for EU Purchasers of CBAM products and 0 otherwise. See Appendix A for variable definitions. The sample includes EU Purchasers and non-EU Producers. Dots represent the β_1 coefficient for each regression specification, while the thicker (thinner) line shows the 90% (95%) confidence intervals.

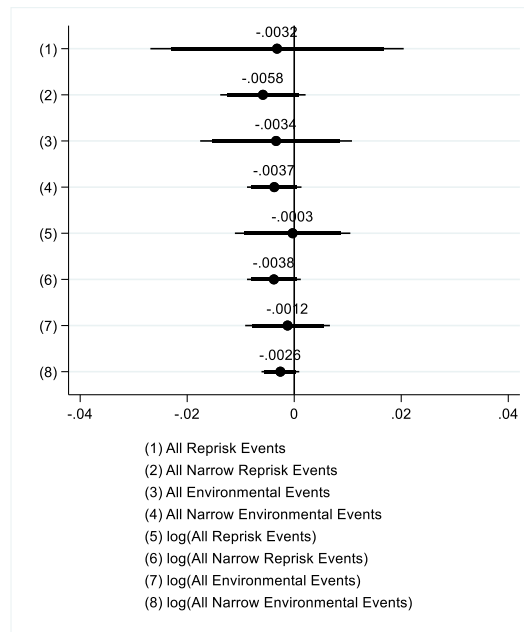


Figure A.10: Trends in Global Economic Policy Uncertainty

This figure illustrates how trends in economic policy uncertainty, geopolitical risk, and climate risk evolve around our event dates. We use monthly data provided by <https://www.policyuncertainty.com/index.html>. Panel A illustrates trends in economic policy uncertainty, Panel B geopolitical risk, and Panel C climate risk.

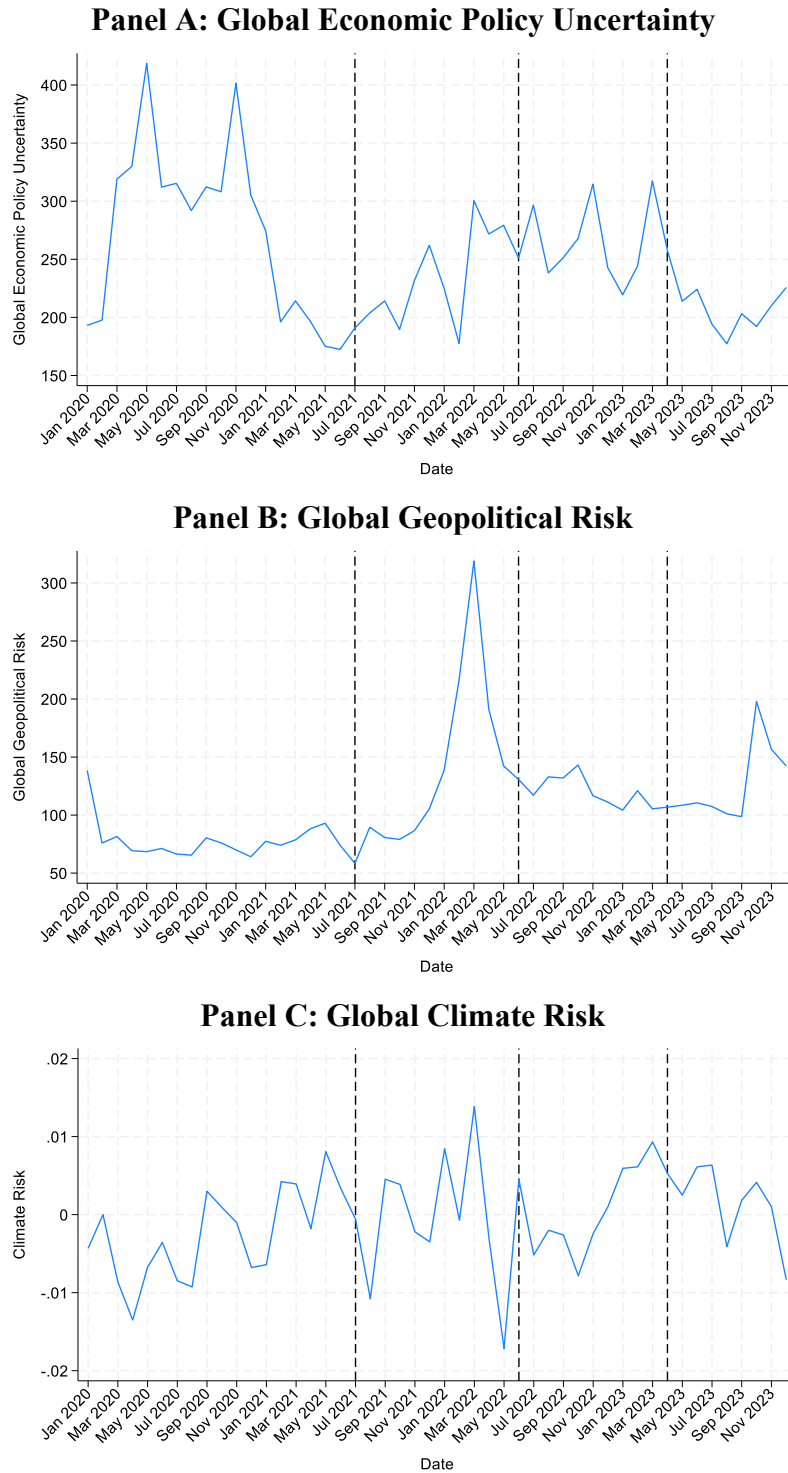
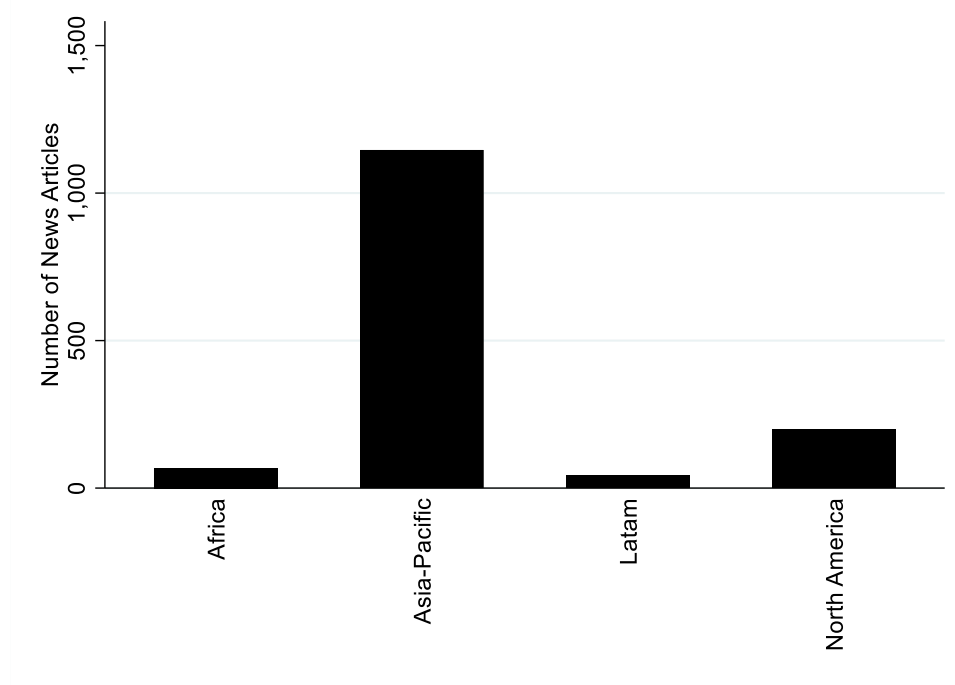


Figure A.11: News Paper Articles on the CBAM by Non-European region

This figure presents the number of news articles across regions around the three CBAM event dates: 07/14/2021, 06/22/2022, and 04/18/2023. Panel A shows the distribution of the amount of news by non-European region containing “CBAM” from ten days prior to the respective event to ten days after this event. Panel B shows the distribution of the amount of news on the respective event day and the two following days. Number of news are retrieved from Factiva.

Panel A: News Articles by Region from day -10 to day +10 around the CBAM three event dates



Panel B: News Articles by Region from day 0 to day +2 around the CBAM three event dates

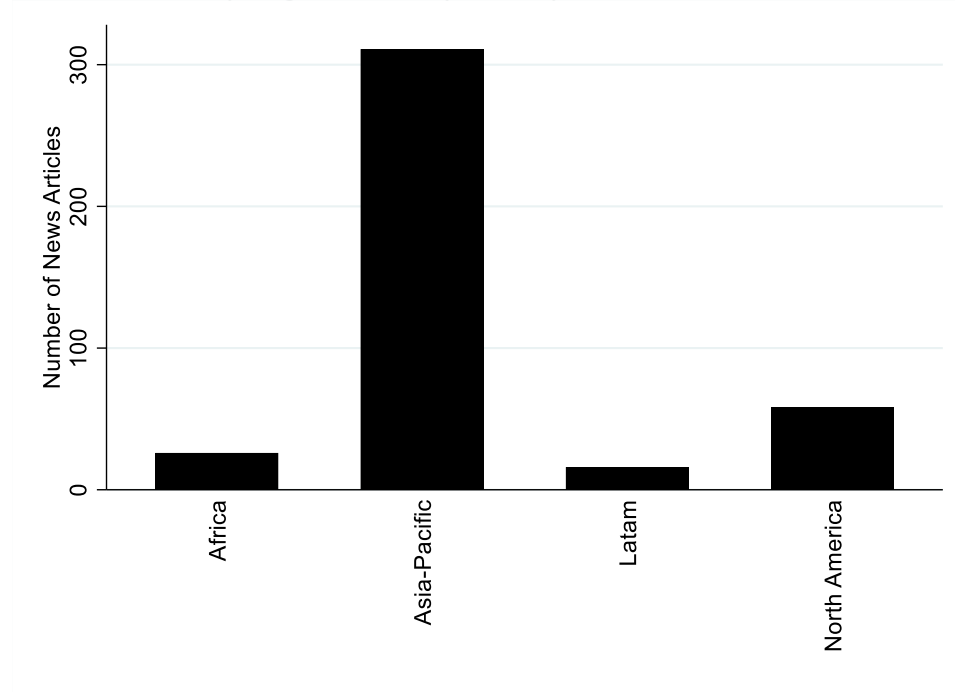


Table A.1: Robustness Analysis for Alternative Treatment of Potential Event Dates

This table presents results of repeating the analysis in Table 4 including the dates in Table 1 that are not selected event dates. Column 1 includes 11-Dec-19. Column 2 includes 4-Mar-20. Column 3 includes 13-Dec-22. Column 4 repeats the analysis including the three dates classified as “confounded” (see Table 1). Column 5 includes the three dates classified as “confounded” and the three dates classified as “selected” (see in Table 1). Column 6 includes the three dates classified as “insignificant” (see Table 1). Column 7 includes the three dates classified as “insignificant” and the three dates classified as “selected” (see in Table 1). Column 8 includes all the dates in Table 1. Column 9 includes all the dates in Table 1 except for 4-Mar-20. Robust standard errors are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Dep. variable	11-Dec-19 <i>Green Deal</i> <i>CAR (0,2)</i> (1)	4-Mar-20 <i>COVID</i> <i>CAR (0,2)</i> (2)	13-Dec-22 <i>Monetary</i> <i>shocks</i> <i>CAR (0,2)</i> (3)	All <i>Confounded</i> <i>(3 Dates)</i> <i>CAR (0,2)</i> (4)	Selected & <i>Confounded</i> <i>(6 Dates)</i> <i>CAR (0,2)</i> (5)	All <i>Insignificant</i> <i>(6 Dates)</i> <i>CAR (0,2)</i> (6)	Selected & <i>Insignificant</i> <i>(9 Dates)</i> <i>CAR (0,2)</i> (7)	All <i>Dates</i> <i>(12 Dates)</i> <i>CAR (0,2)</i> (8)	All Dates <i>except COVID</i> <i>(11 Dates)</i> <i>CAR (0,2)</i> (9)
<i>EU Purchasers</i>	-0.002 (0.001)	-0.055*** (0.002)	0.002 (0.001)	-0.055*** (0.003)	-0.078*** (0.004)	-0.009** (0.004)	-0.033*** (0.005)	-0.086*** (0.006)	-0.032*** (0.005)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	2,767	2,767	2,767	2,767	2,767	2,767	2,767	2,767	2,767
R-squared	0.001	0.188	0.007	0.119	0.130	0.004	0.022	0.081	0.016

Table A.2: The Effect of European Floods in July 2021

This table reports CARs for the event day of 14 July 2021 for EU Purchasers located in countries affected and unaffected by the floods (denoted as *Floods* and *No Floods*, respectively). In column 1 *Floods* includes countries classified as “affected”, while in column 2 *Floods* includes those classified as “heavily affected”, according to prior research (Mavrouli et al. 2022).

Countries affected by the floods		Austria, Belgium, Croatia, Germany, Italy, Luxembourg, the Netherlands, Romania, and Switzerland <i>CAR (0,2)</i> (1)	Belgium, Germany, Luxembourg, the Netherlands, Romania, and Switzerland <i>CAR (0,2)</i> (2)	
Event	#obs.	14-Jul-21	#obs.	14-Jul-21
<i>Floods</i>	415	-0.0052*** (3.78)	295	-0.0043*** (2.95)
<i>No floods</i>	520	-0.0031** (2.07)	640	-0.0040*** (2.87)
Difference		-0.0020 (0.96)		-0.0004 (0.20)

Table A.3: Sensitivity to Using Alternative Sample Definitions

This table presents results of assessing the sensitivity of the results in Table 4 to using alternative sample definitions. Panel A repeats the analysis excluding firms with less than 10 million USD, 100 USD million, and 1,000 million USD in total assets. Panel B repeats the analysis excluding firms from countries with less than 10 observations using the whole sample (columns 1 and 2) and the subset of firms classified as EU Purchasers or non-EU Producers (columns 3 and 4). See Appendix A for variable definitions. Robust standard errors are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A. Sensitivity to Using Alternative Firm Size Thresholds

Variant: Dep. variable		10M Total Assets CAR (0,2)		100M Total Assets CAR (0,2)		1 billion Total Assets CAR (0,2)	
		(1)	(2)	(3)	(4)	(5)	(6)
<i>EU Purchaser</i>		-0.023*** (0.003)		-0.027*** (0.003)		-0.030*** (0.004)	
<i>EU Purchaser with Non-EU Supplier</i>	β_1		-0.033*** (0.004)		-0.034*** (0.004)		-0.034*** (0.004)
<i>EU Purchaser without Non-EU Supplier</i>	β_2		-0.016*** (0.004)		-0.018*** (0.004)		-0.014* (0.007)
$H_0: \beta_1 - \beta_2 = 0$ (p-value)			-0.017*** (0.000)		-0.016*** (0.002)		-0.020** (0.010)
Observations		3,528	3,528	2,458	2,458	999	999
R-squared		0.025	0.028	0.036	0.039	0.060	0.065

Panel B. Sensitivity to Excluding Countries with Few Observations

Variant: Dep. variable		Whole Sample CAR (0,2)		Purchasers/Producers CAR (0,2)	
		(1)	(2)	(3)	(4)
<i>EU Purchaser</i>		-0.025*** (0.003)		-0.026*** (0.003)	
<i>EU Purchaser with Non-EU Supplier</i>	β_1		-0.034*** (0.004)		-0.036*** (0.004)
<i>EU Purchaser without Non-EU Supplier</i>	β_2		-0.017*** (0.004)		-0.017*** (0.004)
$H_0: \beta_1 - \beta_2 = 0$ (p-value)			-0.017*** (0.000)		-0.018*** (0.000)
Observations		2,805	2,805	2,667	2,667
R-squared		0.036	0.040	0.038	0.042

Table A.4: Breakdown of Observations by Country

This table presents a breakdown of the sample firms by country based on whether they are EU/non-EU Purchasers/Producers of CBAM products.

EU Country			Non-EU Country					
	All sample Firms	Purchasers CBAM Product		All sample Firms	Producers CBAM Product		All sample Firms	Producers CBAM Product
Austria	42	25	Argentina	40	9	Mauritius	36	3
Belgium	79	27	Australia	384	56	Mexico	81	6
Bulgaria	26	11	Azerbaijan	1	1	Monaco	1	0
Croatia	44	19	Burkina Faso	1	0	Mongolia	2	2
Cyprus	33	13	Bahrain	17	1	Morocco	39	9
Czech Republic	3	2	Bangladesh	89	23	Namibia	3	0
Denmark	57	23	Barbados	1	0	Nigeria	39	4
Estonia	10	6	Bermuda	11	0	New Zealand	73	5
Finland	79	27	Botswana	10	0	Oman	44	15
France	305	89	Brazil	171	40	Pakistan	163	45
Germany	348	155	Cambodia	1	0	Palestine	13	2
Greece	70	41	Canada	450	46	Panama	1	0
Hungary	16	7	Cayman Islands	42	2	Papua N.G.	1	0
Iceland	13	3	Chile	102	21	Peru	58	18
Italy	165	76	China	4,049	501	Philippines	139	22
Ireland	29	14	Colombia	25	8	Qatar	26	4
Latvia	2	1	Ecuador	2	1	Reunion	1	0
Lithuania	18	9	Egypt	83	17	Russia	53	23
Luxembourg	26	9	Gabon	1	0	Saudi Arabia	141	33
Malta	18	3	Guernsey	14	0	Senegal	2	0
Netherlands	58	19	Ghana	8	0	Serbia	10	1
Norway	94	37	Hong Kong	838	31	Singapore	330	13
Poland	142	81	Indonesia	370	31	South Africa	141	10
Portugal	33	15	Iran	4	0	Sri Lanka	70	4
Romania	34	21	India	1,138	201	Sudan	1	0
Spain	123	49	Israel	220	10	Taiwan	1,284	90
Slovenia	12	4	Ivory Coast	17	2	Tanzania	4	1
Sweden	234	85	Jamaica	14	1	Thailand	440	51
Switzerland	142	64	Japan	2,578	158	Trin.&Tobago	12	1
			Jersey	9	1	Tunisia	22	4
			Jordan	39	8	Turkey	198	35
			Kazakhstan	1	4	Uganda	2	1
			Kenya	19	3	Ukraine	7	4
			Kyrgyzstan	1	0	U.A.E.	46	6
			Korea	1,376	128	U.S.A.	2,163	85
			Kuwait	82	6	Venezuela	3	1
			Lebanon	2	1	Viet Nam	219	34
			Macau	7	1	Virgin Islands	2	0
			Malaysia	546	39	Zambia	10	2
			Malawi	6	0	Zimbabwe	10	2

Table A.5: Identification of Producers and Purchasers of CBAM Products. Sensitivity Analysis

This table repeats the analysis in Table 4 using variants of our approach for identifying Producer's and Purchasers of CBAM products. First, we use alternative threshold percentages (i.e. CBAM Link% from Online Appendix Part B) to classify a GSUBIND as Purchaser of CBAM Products. In our primary analysis, we require at least 40% of the firms in a GSUBIND have at least one identified supplier classified as a Producer of CBAM Products. In Panel A columns 1 to 4 we explore the impact of alternatively using a 30%, or 50% CBAM Link%. Next, in Panel A columns 5 and 6 we expand the list of GSUBINDs classified as producers to include industries where CBAM goods are not the primary focus, but where we expect a significant volume of CBAM products are produced. We then repeat the identification of Purchasers of CBAM products using this expanded list and repeat the analysis in Table 4. The expanded list of GSUBINDs are shown in Panel B. Robust standard errors are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: Multivariate Analysis

Dep. variable		$\geq 30\%$ CBAM Link%		$\geq 50\%$ CBAM Link%		Expanded Producer List	
		CAR (0,2)	CAR (0,2)	CAR (0,2)	CAR (0,2)	CAR (0,2)	CAR (0,2)
		(1)	(2)	(3)	(4)	(5)	(6)
<i>EU Purchaser</i>		-0.024*** (0.003)		-0.027*** (0.003)		-0.020*** (0.002)	
<i>EU Purchaser with Non-EU Supplier</i>	β_1		-0.033*** (0.003)		-0.036*** (0.004)		-0.030*** (0.003)
<i>EU Purchaser without Non-EU Supplier</i>	β_2		-0.015*** (0.004)		-0.018*** (0.004)		-0.012*** (0.003)
$H_0: \beta_1 - \beta_2 = 0$ (p-value)			-0.018*** (0.000)		-0.017*** (0.001)		-0.018*** (0.000)
Observations		3,033	3,033	2,697	2,697	5,750	5,750
R-squared		0.035	0.040	0.037	0.040	0.020	0.024

Panel B: Expanded list of Producers of CBAM Products

CBAM Sector	GSUBIND	Name
Aluminum	15103010	Metal, Glass & Plastic Containers
	20103010	Construction & Engineering
	20106020	Industrial Machinery
Electricity	55103010	Multi-Utilities
Fertilizers	15101020	Diversified Chemicals
	15101050	Specialty Chemicals
Iron & Steel	20102010	Building Products

Table A.6: Alternative Measures of Abnormal Returns

This table repeats the analysis in Table 4 using alternative measures of abnormal returns. In columns 1 to 6 CARs are computed using market-adjusted returns with different specifications for the market return. In columns 7 and 8, CARs are computed based on the market model using the MSCI. Robust standard errors are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Variant:		<i>Market Adjusted (MSCI)</i>		<i>Market Adjusted (Russell 3000)</i>		<i>Market Adjusted (Country Index)</i>		<i>Market Model</i>	
Dep. variable		<i>CAR (0,2)</i>	<i>CAR (0,2)</i>	<i>CAR (0,2)</i>	<i>CAR (0,2)</i>	<i>CAR (0,2)</i>	<i>CAR (0,2)</i>	<i>CAR (0,2)</i>	<i>CAR (0,2)</i>
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>EU Purchaser</i>		-0.018*** (0.003)		-0.019*** (0.003)		-0.030*** (0.003)		-0.025*** (0.003)	
<i>EU Purchaser with Non-EU Supplier</i>	β_1		-0.027*** (0.003)		-0.027*** (0.003)		-0.039*** (0.003)		-0.034*** (0.004)
<i>EU Purchaser without Non-EU Supplier</i>	β_2		-0.010*** (0.004)		-0.011*** (0.004)		-0.022*** (0.004)		-0.015*** (0.004)
<i>H₀: $\beta_1 - \beta_2 = 0$ (p-value)</i>			-0.017*** (0.000)		-0.016*** (0.000)		-0.017*** (0.000)		-0.018*** (0.000)
Observations		2,822	2,822	2,822	2,822	2,822	2,822	2,822	2,822
R-squared		0.029	0.033	0.030	0.034	0.053	0.057	0.036	0.040

Table A.7: Adjusting Standard Errors Following Cohn et al. (2016)

This table repeats the analysis from Table 3 of average CARs calculating statistical significance using adjusted standard errors following the methodology of Cohn et al. (2016). We calculate non-event mean CARs and differences in mean CARs from a nonevent period from 90 days before the first event date to 90 days after the last event date. This period excludes dates with CARs that would overlap with any of the three selected event dates. For the aggregated CARs, we construct measures using nonevent dates with the same distance between dates as for the selected event dates. t-statistics calculated using the adjusted standard errors based on the standard deviation and mean of nonevent sample measures are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Panel A: EU Purchasers vs Non-EU Producers

Event(s)	# obs.	<i>CAR (0,2)</i> 14-Jul-21 (1)	<i>CAR (0,2)</i> 22-Jun-22 (2)	<i>CAR (0,2)</i> 18-Apr-23 (3)	<i>CAR (0,2)</i> All events (4)
EU Purchasers (t-stat)	935	-0.0040*** (4.03)	-0.0143*** (32.72)	-0.0045*** (5.39)	-0.0228*** (14.33)
Non-EU Producers (t-stat)	1,887	0.0048*** (19.33)	0.0049*** (19.65)	-0.0076*** (9.47)	0.0028*** (7.48)
Difference (t-stat)		-0.0088*** (19.91)	-0.0192*** (41.11)	0.0031*** (4.39)	-0.0256*** (16.14)

Panel B: EU Purchasers With vs. Without Non-EU Suppliers

Event(s)	# obs.	<i>CAR (0,2)</i> 14-Jul-21 (1)	<i>CAR (0,2)</i> 22-Jun-22 (2)	<i>CAR (0,2)</i> 18-Apr-23 (3)	<i>CAR (0,2)</i> All events (4)
With non-EU supplier (t-stat)	468	-0.0066*** (12.35)	-0.0207*** (47.62)	-0.0051*** (8.47)	-0.0327*** (22.52)
Without non-EU supplier (t-stat)	464	-0.0015*** (5.66)	-0.0079*** (12.13)	-0.0040 (1.28)	-0.0129*** (3.35)
Difference (t-stat)		-0.0051*** (26.49)	-0.0127*** (55.34)	-0.0011*** (11.05)	-0.0198*** (34.09)

Table A.8: Purchaser & Producer vs Purchaser Only

This table presents cross-sectional variation in CARs on CBAM event dates based on whether the European firm is both a purchaser and producer (of CBAM Products) or only a purchaser (of CBAM Products). *EU Importer Purchaser & Producer* is an indicator variable equal to one if the firm is an EU Purchaser and is from one of the 6 CBAM sectors (which correspond to producers of CBAM products). *EU Purchaser Only* is an indicator variable equal to one if the firm is an EU Purchaser and is not from one of the six CBAM sectors. *With/without Non-EU Suppliers* further indicates restriction to firms with/without non-EU suppliers. *CAR(0,2)* is the cumulative abnormal returns over the window of [0,2] days around the event dates. The considered CBAM event dates are July 14, 2021, June 22, 2022, and April 18, 2023. Robust standard errors are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Dep. Variable		CAR (0,2) (1)	CAR (0,2) (2)
<i>EU Purchaser & Producer</i>	β_1	-0.027*** (0.007)	
<i>EU Purchaser Only</i>	β_2	-0.025*** (0.003)	
<i>EU Purchaser & Producer with Non-EU Suppliers</i>	β_3		-0.041*** (0.010)
<i>EU Purchaser & Producer without Non-EU Suppliers</i>	β_4		-0.012 (0.008)
<i>EU Purchaser Only with Non-EU Suppliers</i>	β_5		-0.033*** (0.004)
<i>EU Purchaser Only without Non-EU Suppliers</i>	β_6		-0.017*** (0.004)
<i>H0: $\beta_1 - \beta_2 = 0$ (p-value)</i>		-0.002 (0.771)	
<i>H0: $\beta_3 - \beta_4 = 0$ (p-value)</i>			-0.029** (0.022)
<i>H0: $\beta_5 - \beta_6 = 0$ (p-value)</i>			-0.016*** (0.003)
Observations		2,822	2,822
R-squared		0.035	0.039

Table A.9: EU vs Non-EU

This table presents cross-sectional variation in CARs on CBAM event dates based on whether the firm is an EU or non-EU firm. *EU Firm* is an indicator variable equal to 1 if a firm is headquartered in one of the 27 countries of the European Union, Iceland, Switzerland, or Norway. Column (1) includes all EU and non-EU firms in the sample. Column (2) includes firms classified as “Purchasers” of CBAM products. Column (3) includes firms classified as “Purchaser Only” firms, namely Purchasers that are not from one of the 6 CBAM Sectors (i.e., Purchasers are not Producers of CBAM products). Column 4 includes “Purchaser & Producer” firms, namely Purchasers from the 6 CBAM Sectors (i.e., Purchasers are not Producers of CBAM products). CAR (0,2) is the cumulative abnormal returns over the window of [0,2] days around the aggregated event dates. The considered CBAM event dates are July 14, 2021, June 22, 2022, and April 18, 2023. Robust standard errors are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Dep. Variable	All Sample Firms <i>CAR (0,2)</i> (1)	Purchasers <i>CAR (0,2)</i> (2)	Purchaser Only's <i>CAR (0,2)</i> (3)	Purchaser & Producer's <i>CAR (0,2)</i> (4)
<i>EU Firm</i>	-0.016*** (0.002)	-0.024*** (0.002)	-0.024*** (0.003)	-0.027*** (0.007)
Controls	Yes	Yes	Yes	Yes
Observations	20,925	10,389	8,372	2,017
R-squared	0.014	0.018	0.019	0.016

Table A.10: Alternative Standard Error Measurement

This table repeats the analysis in Table 4 exploring the impact of alternative measurement of standard errors. In columns 1 and 2 we examine the effect of clustering by GSUBIND. In columns 3 and 4 we calculate statistical significance using adjusted standard errors following the methodology of Cohn et al. (2016). Robust standard errors are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Dep. variable	<i>Cluster by Industry</i> <i>CAR (0,2)</i> (1) (2)		<i>Cohn et al. Adjusted</i> <i>CAR (0,2)</i> (3) (4)	
<i>EU Purchaser</i>	-0.025*** (0.004)		-0.025*** (0.002)	
<i>EU Purchaser with Non-EU Supplier</i> β_1		-0.034*** (0.006)		-0.034*** (0.002)
<i>EU Purchaser without Non-EU Supplier</i> β_2		-0.017*** (0.005)		-0.017*** (0.001)
Controls	Yes	Yes	Yes	Yes
Observations	2,822	2,822	2,822	2,822
R-squared	0.035	0.038	0.035	0.038

Table A.11: Alternative Fixed Effect Structures

This table presents the main results testing alternative fixed effect structures. We repeat the analysis in Table 4 exploring the impact of alternative fixed effect specifications for the sample of EU Purchasers vs Non-EU Producers of CBAM products. Robust standard errors are shown in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Dep. variable		<i>CAR (0,2)</i> (1)	<i>CAR (0,2)</i> (2)	<i>CAR (0,2)</i> (3)	<i>CAR (0,2)</i> (4)	<i>CAR (0,2)</i> (5)	<i>CAR (0,2)</i> (6)	<i>CAR (0,2)</i> (7)	<i>CAR (0,2)</i> (8)
<i>EU Purchaser</i>		-0.026*** (0.007)		-0.025*** (0.003)		-0.039*** (0.004)		-0.041*** (0.009)	
<i>EU Purchaser with non-EU Suppliers</i>	β_1		-0.033*** (0.007)		-0.034*** (0.004)		-0.046*** (0.004)		-0.047*** (0.009)
<i>EU Purchaser without non-EU Suppliers</i>	β_2		-0.019*** (0.007)		-0.017*** (0.004)		-0.031*** (0.005)		-0.036*** (0.009)
<i>H0: β_1- $\beta_2 = 0$ (p-value)</i>			-0.015*** (0.004)		-0.017*** (0.000)		-0.015*** (0.004)		-0.011** (0.028)
Industry	Yes	Yes	No	No	No	No	Yes	Yes	
EU ETS Regulated	No	No	Yes	Yes	No	No	Yes	Yes	
Major Supplier	No	No	No	No	Yes	Yes	Yes	Yes	
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	
Observations	2,821	2,821	2,822	2,822	2,759	2,759	2,758	2,758	
R-squared	0.048	0.051	0.035	0.038	0.105	0.107	0.119	0.120	

Table A.12: Alternative Measure of Market Power

This table shows a cross-sectional analysis for European Purchasers of CBAM products using an alternative measure of market power. *Higher HHI* is defined as an indicator variable for firms in industries in the top tercile of the sample distribution for industry Herfindahl Index (HHI). HHI is computed based on OECD Input-Output country-industry exports and is measured by industry. Robust standard errors are in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Dep. variable	All EU Purchasers <i>CAR (0,2)</i> (1)	without non-EU suppliers <i>CAR (0,2)</i> (2)	with non-EU suppliers <i>CAR (0,2)</i> (3)
<i>Higher HHI</i>	-0.012** (0.005)	-0.001 (0.007)	-0.017*** (0.006)
Controls	Yes	Yes	Yes
Observations	935	467	468
R-squared	0.037	0.003	0.084

Table A.13: Correlation of Cross-Sectional Variables

This table presents the pairwise Pearson correlations of the independent variables presented in tables 6 to 8 for the sample of European purchasers of CBAM products with non-EU suppliers. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
(1) Higher CBAM Import Exposure	1.00					
(2) Higher Carbon Price	-0.30***	1.00				
(3) Lower Carbon Intensity	-0.49***	0.16***	1.00			
(4) Suppliers with Sustainability Focus	-0.07	-0.03	-0.10*	1.00		
(5) Lower Margin	0.08*	0.05	0.04	-0.01	1.00	
(6) Higher Supplier Concentration	0.40***	0.20***	0.50***	-0.05	0.03	1.00

Table A.14: Integration of Cost and Pass-Through Analyses

This table presents the cross-sectional variation in the CARs on CBAM event dates for the sample of European purchasers of CBAM products with non-EU suppliers including the independent variables used in Tables 6 and 7. Column 1 repeats the Table 6 analyses of exposure measures to CBAM costs. Column 2 repeats the Table 7 analyses of firm ability to deal with CBAM costs. Column 3 combines all analyses and Column 4 combines all analyses excluding *EU Purchaser with Higher CBAM Import Exposure* and *EU Purchaser with Higher Supplier Concentration*, due to multicollinearity concerns. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Dep. variable	CAR (0,2) (1)	CAR (0,2) (2)	CAR (0,2) (3)	CAR (0,2) (4)
<i>EU Purchaser</i>	-0.005 (0.007)	-0.014*** (0.005)	0.003 (0.008)	0.001 (0.007)
<i>EU Purchaser with Higher CBAM Import Exposure</i>	-0.003 (0.008)		-0.001 (0.008)	
<i>EU Purchaser with Lower Carbon Price</i>	-0.023*** (0.007)		-0.024*** (0.007)	-0.025*** (0.007)
<i>EU Purchaser with Higher Carbon Intensity</i>	-0.006 (0.007)		-0.002 (0.007)	-0.007 (0.006)
<i>EU Purchaser with Suppliers with Sustainability Focus</i>	-0.013** (0.006)		-0.013** (0.006)	-0.013** (0.006)
<i>EU Purchaser with Lower Margin</i>		-0.013** (0.005)	-0.017** (0.007)	-0.017** (0.007)
<i>EU Purchaser with Higher Supplier Concentration</i>		-0.010* (0.005)	-0.008 (0.007)	
Controls	Yes	Yes	Yes	Yes
Observations	2,364	2,822	2,364	2,364
R-squared	0.045	0.030	0.040	0.040

Table A.15: Free Allowances and ETS Coverage Restricted to EU Purchasers within the ETS Sample

This table presents cross-sectional variation in cumulative abnormal returns (CARs) around CBAM event dates based on variation in exposure to the EU ETS. See Appendix A for variable definitions. The analysis is restricted to firms coded as *EU Purchasers* = 1 that participate in the EU ETS in 2019. *Higher Free Emissions* is an indicator variable for whether the firm is above the sample tercile of the ratio of free allowances to total ETS emissions in 2019. *Lower ETS Coverage* is an indicator variable for whether the firm is below the sample tercile of the ratio of total ETS emissions to total scope 1 and 2 emissions from Trucost in 2019. *Lower Margin* is an indicator variable for whether the firm's profit margin is in the lowest sample tercile of the sample distribution. *Higher CBAM Import Exposure* is an indicator variable for whether the firm is headquartered in an industry-country within the top tercile of non-EU imports from non-EU CBAM producers. *CAR (0,2)* is the cumulative abnormal returns over the window of [0,2] days around the event dates. The considered CBAM event dates are July 14, 2021, June 22, 2022, and April 18, 2023. Robust standard errors are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Dep. variable	<i>CAR (0,2)</i> (1)	<i>CAR (0,2)</i> (2)	<i>CAR (0,2)</i> (3)	<i>CAR (0,2)</i> (4)
<i>Higher Free Emissions</i>	-0.018* (0.010)		-0.015 (0.011)	-0.014 (0.011)
<i>Lower ETS Coverage</i>		0.017* (0.010)	0.010 (0.012)	0.012 (0.012)
<i>Lower Margin</i>				-0.022** (0.011)
<i>Higher CBAM Import Exposure</i>				-0.026*** (0.008)
Controls	Yes	Yes	Yes	Yes
Observations	200	200	200	200
R-squared	0.077	0.070	0.081	0.132

Table A.16: Country-Level Risks

This table presents cross-sectional variation in cumulative abnormal returns (CARs) around CBAM event dates including additional control variables for geopolitical risk and economic policy uncertainty. The test compares *EU Purchasers* (with and without non-EU suppliers) to *Non-EU Producers*. See Appendix A for variable definitions. *Geopolitical Risk Index (GPR)* is the geopolitical risk index from Caldara and Iacoviello (2022) averaged over the months corresponding to the selected CBAM events. *Economic Policy Uncertainty Index (EPU)* is the economic policy uncertainty index from Baker et al. (2016) averaged over the months corresponding to the selected CBAM events. In columns 1-3 country-level risk is measured at the firm's country location, while in columns 4-6 country-level risk is measured at the main supplying country (based on data from Input-Output Tables). Column 7 includes fixed effects for the main supplying country. *CAR (0,2)* is the cumulative abnormal returns over the window of [0,2] days around the event dates. The considered CBAM event dates are July 14, 2021, June 22, 2022, and April 18, 2023. Robust standard errors are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

Dep. variable	Measurement of GPR and EPU: Country of the focal firm			Measurement of GPR and EPU: Main supplying country			Extended FE
	<i>CAR (0,2)</i>	<i>CAR (0,2)</i>	<i>CAR (0,2)</i>	<i>CAR (0,2)</i>	<i>CAR (0,2)</i>	<i>CAR (0,2)</i>	<i>CAR (0,2)</i>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>EU Purchaser</i>	-0.031*** (0.003)	-0.035*** (0.004)	-0.037*** (0.005)	-0.028*** (0.003)	-0.034*** (0.004)	-0.036*** (0.004)	-0.053*** (0.013)
<i>Geopolitical Risk Index (GPR)</i>	-0.0002** (0.000)		-0.002 (0.002)	0.010*** (0.003)		0.011** (0.005)	
<i>Economic Policy Uncertainty Index (EPU)</i>		0.003** (0.001)	0.004*** (0.001)		0.003*** (0.001)	0.002 (0.001)	
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fixed effects for the main supplying country							Yes
Observations	2,462	1,832	1,719	2,411	1,803	1,698	2,758
R-squared	0.042	0.053	0.059	0.044	0.052	0.060	0.131