

# Effect of a European Carbon Border Adjustment Mechanism on the APAC region: a Structural Gravity Analysis

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## 1. Introduction

The increasing price of the EU ETS allowances brings back concerns over carbon leakage for the European industry. Recently, the EU announced its plan to introduce a Carbon Border Adjustment Mechanism (CBAM) in July 2021, to address such concerns. This mechanism takes the form of an import tax at the EU border, whose value is determined based on the difference between the carbon price paid by EU producers and foreign producers, for a given product. By doing so, the EU aims to ensure a level-playing field for its industry. The EU CBAM is the first proposal of its kind to be passed and planning to be implemented. Firms aiming to import targeted products into the EU (metals, chemicals, cement and electricity) will have to report the amount of embodied emissions in their products, and will have to purchase CBAM certificates, reflecting the carbon price paid by EU producers of similar product. As a tax on imports to the EU, it is likely that the CBAM will have noticeable and long-lasting consequences on trade flows, production structure and, possibly, on carbon pricing policies among EU trade partners.

## 2. Methodology

Using a structural gravity mode with trade data for the year 2014, we simulate the impact that CBAM will have on trade, welfare and production. As the EU justified the introduction of CBAM as a form of climate protection, we also calculate the impact of the policy on emissions. In addition to global results, we offer specific, country-level analysis for economies of the Asia and the Pacific (APAC) region. A region with high-energy intensity in production, heavily reliant on trade and little carbon pricing policies implemented, Asia and the Pacific is expected to be particularly vulnerable to CBAM. Our paper distinguishes itself from the recent literature (Korpar et al., 2023; Takeda and Arimura, 2023) by including comprehensive calculations for the emission resulting from the introduction of CBAM, and by providing a case study on the APAC region.

## 3. Main findings

Our findings show that CBAM would have a small impact on welfare, regardless of the

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region. On the other hand, we find that the policy is expected to reduce exports, with a global decrease between -0.29% (metal products) and -1.49% (iron and steel). South Asia and Central Asia showing the largest loss in exports, estimated around -10.52% for South Asian crude iron and steel and around -7.03% for Central Asian chemicals. This particular result seems to confirm that CBAM would be a protectionist policy. We observe a rebound in production among EU countries, estimated between 1.31% (non-ferrous metal) to 5.24% (iron and steel), with a rebound in emissions from production of similar magnitude. Globally, CBAM is expected to reduce emission, though the majority of this reduction would come from shipping activities. We estimate this reduction to be around 2,500MtCO<sub>2</sub>, had the policy been introduced in 2014. 90% of the reduction would be coming from a decrease in emission from shipping activities and trade (reduction of exports, or exporting towards closer destination). While we do observe some rebound in emission from the production (chemicals, non-ferrous metal), they are generally offset by emission from trade. The largest emission reduction is from the chemical sector (-1,648MtCO<sub>2</sub>), then from iron and steel sector (-852MtCO<sub>2</sub>).

#### 4. Conclusion

Loss of industrial competitiveness is a growing concern among economies that are considering the implementation of carbon pricing. While many countries have introduced some form of carbon taxation or cap-and-trade, the discrepancy in tax rate could still promote industrial relocation to countries with relatively low carbon pricing. Carbon leakage fears are thus coming back in the public debate, especially among developed countries, and the EU CBAM policy is expected to tackle them. While we confirm that the policy would have little impact on welfare, our findings show that it would result in a substantial decrease in exports globally. Interestingly, we also find large differences in vulnerability depending on the level of development, and this is exemplified by our case studies of the Asia and the Pacific regions. Middle-income economies would be especially affected by CBAM, with larger decrease in exports, production and emissions. Thus, our study suggests that this policy may contribute to the creation of a ‘carbon club’ and might widen global inequalities between countries. One of our main findings, however, highlights that, despite a small rebound in emission from production, CBAM would lead to a substantial decrease in emissions overall, mostly due to the fall in exports. Though we probably overestimate such emission reduction to approximations in calculating sea distances, we can still conclude that CBAM is an effective policy to reduce CO<sub>2</sub> emissions globally.

#### Main references:

Korpar, N., Larch, M., & Stöllinger, R. (2023). The European carbon border adjustment mechanism: a small step in the right direction. *International Economics and Economic Policy*, 20(1), 95–138. <https://doi.org/10.1007/s10368-022-00550-9>

Takeda, S., & Arimura, T.H. (2023). *A Computable General Equilibrium Analysis of EU CBAM for the Japanese Economy*. (Research Institute of Economy, Trade and Industry Discussion Paper February 2023 No. 23-E-006). Retrieved from <https://www.rieti.go.jp/jp/publications/dp/23e006.pdf>

**Table 1. Emissions attributed to CBAM (ETS price: 87 USD/tCO<sub>2</sub>)**

CBAM 87 Unit: CO <sub>2</sub>	Mt	Total	
		Production	Shipping
Asia and the Pacific		-667.60	-351.00
		-1,018.60	
Southeast Asia		-18.52	14.00
		-4.52	
South Asia		-223.10	-55.30
		-278.40	
North America		32.71	-451.00
		-418.29	
South America		6.38	-40.01
		-33.63	
EU31		585.61	-1253
		-667.39	
Rest of Europe		-56.49	78.00
		21.51	
Central Asia		16.85	-50.21
		-33.35	
Middle East		62.22	-91.30
		-29.08	
Africa		56.54	-43.02
		13.52	
Total (World)		-205.40	-2242.84
		-2,448.24	