

The impact of CBAM on Chinese regional economy

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Author: Chen Pan

Co-Authors: Shantong LI, Jianwu HE

The European Union's Carbon Border Adjustment Mechanism (CBAM), designed to address carbon leakage, poses significant challenges to carbon-intensive export sectors globally. As China is a major exporter of CBAM-covered products (e.g., steel, aluminum, cement), its regional economies—particularly provinces reliant on high-carbon industries—may face divergent economic risks, including increased trade costs, industrial restructuring pressures, and employment shifts. This study explores the potential heterogeneous impacts of CBAM across Chinese provinces under varying implementation scenarios, with a focus on Gross Regional Product (GRP), employment, and industrial structure. It further evaluates how China's domestic carbon policies could interact with CBAM to shape regional economic outcomes.

Employing a multi-regional input-output (MRIO) model embedding Chinese provinces, and with provincial emission data integrated, this study simulates the following scenarios:

Baseline Scenario: Current economic and carbon emission trends without CBAM.

CBAM Implementation Scenarios:

Scenario 1: Covers electricity, steel, aluminum, cement, fertilizers, and hydrogen, accounting for direct emissions only.

Scenario 2: Expands coverage to all EU ETS sectors, with direct emissions.

Scenario 3: Covers Scenario 1 industries but includes both direct and indirect emissions.

Scenario 4: Covers Scenario 2 industries with direct and indirect emissions.

Domestic Policy Intervention Scenarios:

Policy Scenario 1: Integrates CBAM-covered sectors into China's carbon emission trading market.

Policy Scenario 2: Hybrid policy combining Policy Scenario 1 with a carbon tax mechanism.

We aim to answer three research questions. First, how do different CBAM scenarios affect GRP, employment, and industrial structures across Chinese provinces? Second, what are the spatial disparities in economic impacts, particularly between energy-intensive inland provinces (e.g., Shanxi, Inner Mongolia) and coastal manufacturing hubs (e.g., Guangdong, Jiangsu)? Third, to what extent could China's domestic carbon policies mitigate or reshape these impacts?

This study highlights the urgency of spatially differentiated strategies to address CBAM-induced risks. Potential policy considerations include accelerating regional decarbonization roadmaps, enhancing carbon market linkages, and designing transitional support for vulnerable industries and workforces. The final results will provide empirical evidence to inform China's climate policy design and interprovincial coordination mechanisms in response to CBAM.