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CBAM, abatement technology adoption, and trade agreement: the case of EU-Mercosur Partnership Agreement

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Abstract

Expanding the EU's carbon border adjustment mechanism (CBAM) to cover other emission-intensive but "hard-to-abate" sectors such as agriculture has been mentioned in relevant policy debates. For an agricultural CBAM to be effective in motivating foreign producers to reduce emissions embodied in their exports (thus lowering global emissions), sizable trade flows should exist and producers can make use of available abatement technology. We use the recently concluded EU-Mercosur Partnership Agreement as an example to investigate the likely emission impacts of a potential EU agricultural CBAM. In the numerical analysis, we first simulate the agricultural trade impacts of the EU-Mercosur agreement. We further compare the emission reduction outcome under several trade policy scenarios under the hypothetical CBAM, including the actual bilateral trade policy concessions contained in the EU-Mercosur agreement and a hypothetical scenario with full bilateral trade liberalization. We conclude with a set of observations on the effectiveness of CBAM in relation to the degree of trade policy liberalization and access to emission abatement technologies.

Introduction

Domestic carbon prices for realizing agricultural emission reduction goals may result in carbon leakages and domestic competitiveness losses. These concerns underline the discussions on using CBAM to protect domestic output and to incentivize exporting countries to reduce emissions embodied in exports. However, the extent to which such a policy mix (i.e., domestic carbon price and CBAM) can generate sizable external effects vis-à-vis a country's trading partners relies on existing trade patterns. In the presence of substantial imports of emission intensive products (e.g., beef), a CBAM by the importing country could incentivize key exporters to lower emission intensities in their production either through carbon pricing and/or through adoption of abatement technologies, as the alternative could be a loss of exports. However, in the case of lower imports of emission intensive products, a CBAM by the importing country will have little impact on lowering emission intensities of the exporting countries. In any case, for a CBAM policy to be effective in protecting the competitiveness of domestic production while realizing the global emission reduction objective, the importing country will have to possess some leverages to influence exporters, for example through sizable trade linkages.

The recently concluded EU-Mercosur Partnership Agreement offers an interesting case for studying how the potential effects of a hypothetical EU agricultural CBAM can be influenced by tariff concessions contained in the trade agreement. Both the EU and the Mercosur are major agricultural exporters but with different export profiles, reflecting differences in factor endowments, technologies, and trade and domestic policies. One key area of the agreement that has garnered attention across EU member states is the concessions made by the EU on beef imports. These concessions are offered in the form of two new Tariff Rate Quotas (TRQs). On the surface, these new TRQs may lead to additional beef imports sourced from Mercosur into the EU. However, a recent analysis by Matthews (2025) suggests that the existence of over-quota imports at the current moment would simply imply that part of these over-quota imports will be turned into in-quota imports when the TRQs are fully phased in, thereby resulting in limited import expansion. Assuming domestic carbon prices are implemented in the EU (or some other measures that effectively raise the costs of emissions on EU producers), EU beef imports from Mercosur could rise further with the EU-Mercosur agreement, potentially making the hypothetical CBAM a more worthwhile tool to pursue as both a trade defense mechanism and a climate policy instrument.

Methodology and scenarios

Following the work of Jensbye, Clora and Yu (2023) on modeling endogenous abatement technology adoptions connected to domestic carbon price, Jensbye, Clora and Yu (2024) further developed a modeling structure within a modified recursive dynamic GTAP model to link CBAM by an importing country with abatement technology

adoptions in exporting countries. In this study, we extend this modeling framework to study the interlinkages between CBAM and free trade agreements in promoting abatement technology adoptions, with specific reference to the EU-Mercosur agreement.

We study three hypothetical scenarios, all assuming that the EU adopts an agricultural CBAM in connection with the implementation of its agricultural emission targets towards 2030. Additional elements of the three scenarios and the intended analytical purposes are detailed below:

- a. Scenario 1: EU implements an agricultural CBAM based on its agricultural carbon price and the exporting countries' emission intensities. Current trade policy instruments for both the EU and its trading partners are unchanged. Exporting countries adopt their respective emission abatement technologies in responding to the burden placed by the EU's CBAM tariffs. This scenario captures the base case trade and emission outcomes of the EU carbon price and CBAM policies.
- b. Scenario 2: in addition to all the elements implemented in Scenario 1, we further impose the bilateral trade policy concessions contained in the EU-Mercosur agreement. This scenario captures the interplay between potentially rising imports from tariff concessions by the EU (e.g. new TRQs on beef) and possibly intensifying burden on Mercosur producers to lower emission intensities in connection with the rising imports and the EU CBAM. This interaction can lead to changing incentives for Mercosur producers to adopt abatement technologies.
- c. Scenario 3: in addition to all the elements implemented in Scenario 2, we assume further opening of the EU agricultural markets beyond the EU-Mercosur agreement. This scenario would likely lead to higher imports into the EU that potentially augment the incentives for adopting abatement technologies in Mercosur.

Expected findings

The modeling exercises offered in this study can shed new light into the complex interplays between domestic climate policy, CBAM, and trade agreements. We focus our analytical attention on studying how these interactions can lead to different outcomes on trade, domestic production, and global emissions. These results are useful in evaluating the sustainability and competitiveness outcomes of current and emerging trade and climate policy tools.