What Carbon Border Adjustment Mechanism for the EU?

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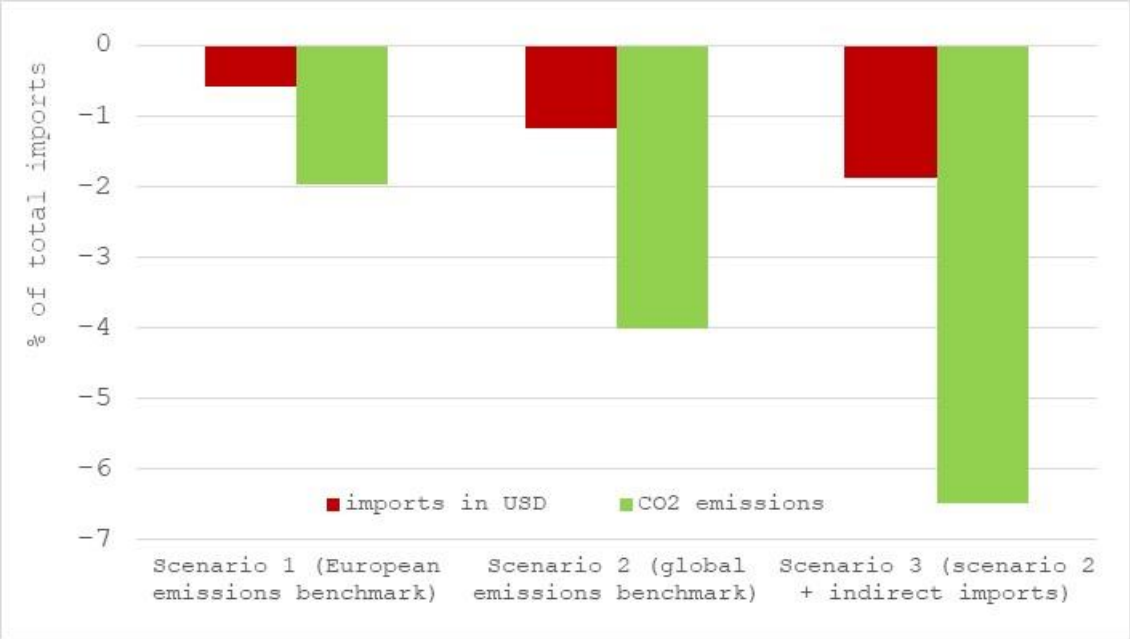
While the principle of a European Carbon Border Adjustment Mechanism (CBAM) has been agreed on, discussions as to its calibration are still underway. This post presents three scenarios in which the calculation of the tax base and the scope of the mechanism vary. These choices have significant consequences: the gains in terms of CO2 reduction can vary by a factor of three, depending on the scenario chosen.

Chart 1: Short-term impact of the CBAM on EU imports and import-related emissions



Source: authors' calculations, OECD, CEPII, Cezar & Polge (2020).

Note: Scenario 1 reduces EU import emissions by almost 2% (corresponding to a 0.5% decrease in imports in USD terms), while Scenario 3 reduces emissions by 6.5% (corresponding to a 1.9% decrease in imports in USD terms).

More than 15 years after the creation of the European Union Emissions Trading Scheme (EU ETS), the European Commission (EC) has made the CBAM one of the key measures of its Green Deal. It should make its proposal public by June 2021, with a view to implementation in 2023. The European Parliament has also proposed its version of the mechanism in a resolution adopted on 10 March 2021.

The CBAM aims to offset the difference in tariffs between the European Union (EU) and its trading partners by taxing imports according to their greenhouse gas (GHG) emissions content. Indeed, import-related emissions account for about one-third of the EU's total carbon footprint. The objective is threefold: i/ to extend carbon pricing to all firms with access to the European market, ii/ to reduce competitive distortions between domestic and foreign firms, and iii/ to encourage the greening of global value chains (GVCs) and thus of international trade.

This post calculates the impact of the CBAM in terms of GHG and trade flow reductions. To do so, three scenarios are considered, based on the scope of the emissions used to calculate the tax (European or global) and on whether or not indirect emissions incorporated into GVCs are taken into account.

The consequences of the choice of calibration are significant (Chart 1). According to our estimates, the broadest scenario would result in a reduction in emissions three times greater than the narrowest scenario. More specifically, it would result in a 6.5% reduction in emissions in European imports, for a 1.9% reduction in imports in value terms. The narrowest scenario would have an impact of around 2% on emissions and 0.5% on imports. The intermediate scenario would have an impact of 4% and 1.2% respectively. We note that irrespective of the scenario chosen, the relationship between reductions in CO2 and imports remains constant.

These simulations supplement estimates in the literature on the overall impact of the mechanism (for instance Fouré et al. 2016). Furthermore, they contribute directly to the current discussions at European level.

Our scenarios

The European discussions focus in particular on the benchmark to be used to calculate the CBAM. This serves to define the amount of GHGs attributed to a product and therefore influences the tax base. Ideally, this tax base should be determined directly at the company level, so that firms are taxed according to their own emissions. As this option is not yet feasible, an alternative is to apply a benchmark based either on EU emissions or on those of its trading partners.

Our first two scenarios concern these alternatives. The s1 scenario is based on European emissions. The CBAM base would be calculated as if the carbon intensity of foreign firms were identical to that of European firms. The s2 scenario is based on global (non-EU) emissions. The s1 scenario is less ambitious as the carbon intensity of EU production is well below the global average, especially in emerging and developing countries (Cezar & Polge 2020a). The s3 scenario extends s2 by broadening the coverage of the mechanism to include the international sharing of downstream stages of GVCs. More specifically, it includes indirect imports from the sectors targeted by the tax and incorporated into imports from other (non-targeted) sectors. This would mean, for instance, taxing the import of a car in proportion to the amount of steel it contains. This is therefore the broadest scenario.

Our simulations assume that the CBAM would fully replace the current free allocation policies of the EU ETS. We take, as additional assumptions, a tax of EUR 30/tCO2 (a rather conservative assumption given the recent trend in carbon prices) and a sectoral targeting limited to the three most emitting sectors exposed to international competition: steel, aluminium and cement (Naegele & Zaklan 2019). Lastly, the time horizon is short (first years of application): substitution effects (domestic or external) could effectively be added in the long term, with an undetermined impact.

In the s1 and s2 scenarios, we used the TECO2 database (OECD) as a benchmark for GHG emissions to obtain the value of the tax base. For the equivalent in terms of trade, we use the TiVA database (OECD). For the *s3* scenario we follow Cezar & Polge (2020b). We then apply the sectoral elasticities from the ProTEE database (CEPII).

What is the CO2 efficiency of each scenario?

The consequences of the choice of benchmark are not negligible in terms of the measure's impact. This choice must therefore be a major consideration in the European discussions.

A benchmark based on the emissions of the EU's trading partners (s2) would double the effectiveness of the mechanism in terms of GHG reductions compared to an application based on European emissions (s1). Although the sectoral scope remains the same (steel, aluminium and cement), the emissions attributed to each sector vary greatly, which explains the difference in results. Furthermore, the S2 scenario makes it possible to discriminate between countries based on their emissions and thus create additional incentives to improve their energy efficiency.

Moreover, the inclusion of indirect imports (s3) increases the sectoral scope of application and triples the effectiveness of the CBAM. It would then extend throughout the production chain: even with a narrow target (such as steel), the scope would include multiple sectors (such as cars).

What European guidelines?

In developing the CBAM, the EU must take into account legal barriers, including those resulting from WTO rules and existing EU trade agreements, as well as practical barriers. It is therefore likely that the Commission will favour a benchmark based on EU emissions (the equivalent of s1), since the ETS provides reliable data (DG-Trésor 2021).

In addition, because of the complexity and traceability of carbon in GVCs, the mechanism is likely to be applied to standardised products. It is more practical to assess the CO2 content of a product like steel than of a finished product. The latter requires by definition more intermediate consumption, in a context of strong fragmentation of value chains, with production systems with variable energy efficiency.

However, the European Parliament resolution suggests a benchmark based on the global average of GHG emissions contained in each product . It also proposes that the mechanism be extended to indirect imports.

The s3 scenario, which is closer to the main ideas of the Parliament's proposal, would therefore be more complex to implement and would involve more legal risks. It would nevertheless be more effective in terms of GHG reduction and would provide a more extensive application of the principle of equal treatment for all firms operating in the European market.

Furthermore, without including indirect imports, the taxation of imported inputs would increase the production costs of European firms within their GVCs compared to their external competitors, whose chains would not be affected (Devulder & Lisack 2020). A risk of carbon leakage would therefore remain, in addition to potential substitution strategies (imports of finished products rather than those targeted by the tax). This could also lead to losses in export price competitiveness. One option would be to introduce export rebates for EU firms (Bellora & Fontagné 2020).