A European Carbon Border Adjustment Mechanism
The Devil is in the Detail

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The EU Commission launched a public consultation on the adoption of a Carbon Border Adjustment Mechanism (CBAM), i.e. a fee to be levied on imported goods. A CBAM aims to reflect their carbon content and level the playing field with domestic producers of the same goods, who pay for the carbon they emit. A CBAM might be a substitute for, not a complement to, the current policies to counter carbon leakage, such as the distribution of free allowances as well as discounts on the cost of energy for energy-intensive, trade-exposed industries.

In principle, a CBAM is an effective policy to limit trade distortions in a world where some countries (such as the EU member states) regulate carbon, while many others do not. However, CBAMs in the real world require many simplifications and assumptions, to become feasible from an economic and administrative point of view. An imperfect CBAM may or may not be a better option than the existing tools to address trade distortions. It all depends on the design.

Introduction

In her 2020 State of the Union Address, EU Commission President Ursula von der Leyen proposed to "increase the 2030 target for emission reduction to at least 55%" from 40%. She also proposed to adopt a Carbon Border Adjustment Mechanism (CBAM) in order to "motivate foreign producers and EU importers to reduce their carbon emissions, while ensuring that we level the playing field in a WTO-compatible way" (von der Leyen, 2020). A few weeks earlier, the EU Commission had launched a public consultation on the same subject (EC, 2020). According to the Commission, a CBAM "would ensure that the price of imports reflect more accurately their carbon content" and "it would be *an alternative* to the measures that currently address the risk of carbon leakage in the EU's Emissions Trading System (EU ETS)" (emphasis added).

But what is a CBAM, and why is it being considered? The EU set unilateral climate goals, aiming at carbon neutrality by 2050, within the Paris framework. This places Europe upon a more ambitious path than its main trading partners, including the US, China and India. A pillar of its strategy is carbon pricing, i.e. a variety of instruments (e.g. environmental taxes, a cap-and-trade scheme, etc.) aimed at enforcing the "polluter pays" principle. While in the long run this may deliver environmental benefits, in the short run it increases the cost of carbon-intensive products, including several intermediate products or inputs, such as energy, steel, cement, etc. In an interconnected and interdependent world, unilateral carbon pricing may cause a phenomenon known as "carbon leakage", whereby emissions reductions in one jurisdiction are partly or fully offset by emissions increase elsewhere. This is due to the fact that, while domestic *producers* pay the full cost of carbon, foreign producers of imported goods do not necessarily do so. A CBAM is intended to turn a production-based carbon pricing into a consumption-based system. By doing so, it also responds to a further political concern, i.e. preserving the competitiveness of domestic producers (and therefore employment) in energy-intensive, trade-exposed (EITE) industries, which are more likely to be a source of leakage. Finally, CBAMs are often thought of as a means to pressure trading partners to adopt more stringent climate policies (Morris, 2018).

It should be emphasised that a CBAM – as the Commission's Inception Impact Assessment clarifies – would be a substitute for, not a complement to, existing policies to address carbon leakage. These include, *inter alia*, the distribution of free allowances to EITE industries, the possibility to compensate some electro-intensive industries for the increases in electricity prices, etc. Moreover, a CBAM might aim to either embed the cost of carbon in the imported goods, or to waive the same cost away from exported goods, or both. The Commission's proposal is only focused on the former and so will this short paper, even though covering the latter goods might improve the whole policy's consistency, effectiveness, and political feasibility, while reducing potential distortions in international trade.

There is a widespread consensus among economists that world-wide carbon pricing would be a first-best climate policy. Since many countries do not price carbon enough – or at all – while others, such as Europe, have adopted stringent policies, a CBAM may be an effective instrument to prevent international trade from undermining the effectiveness of unilateral climate policies. However, this statement (which can also be assumed to reflect a widespread consensus) relies on the assumption that the "carbon fee" levied on each imported good accurately reflects its actual carbon content. This, in turn, implies that it is technically possible, and economically feasible, to precisely assess the inputs and processes that are behind a product. In the real world, this is nearly impossible. Hence, CBAMs should be evaluated not in principle, but against the inevitable, practical simplifications and compromises that are required to make it enforceable. In other words, while in theory CBAM is almost a no-brainer, in practice it all depends on its design.

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Design Issues

The design of a CBAM needs to address several issues related to its effectiveness, enforceability, and compatibility with the broader legal context of international trade. We shall not deal with this latter point, except for saying that legal scholars seem to agree that carbon border adjustments may be designed in a WTO-consistent way (Porterfield, 2019; Condon and Ignaciuk, 2013).

When designing a CBAM, a balance needs to be struck between its ability to reflect the actual carbon content of imported goods and its administrative feasibility. The design of carbon adjustments involves at least the following dimensions (Cosbey et al., 2019):

Targets and Interaction with other policies
CBAMs may have several legitimate goals, such as preventing carbon leakage, protecting the competitiveness of EITE industries, and inducing trading partners to adopt climate policies. However, costs imposed on imported goods should not exceed the amount that a domestic producer would incur. Moreover, CBAMs should not be used in conjunction with other policies, such as performance standards or other regulations.

Product eligibility
In order to reduce the administrative costs and complexity, CBAMs might be designed as market-wide instrument. They should target carbon-intense and trade-exposed industries and products instead, that can be shown to be responsible for the large majority of leakage.

Embodied emissions
Quantifying the precise amount of emissions that are embodied in imported goods is a crucial aspect of how a CBAM is designed. Collecting firm-specific data is costly and potentially open to abuses, such as “re-shuffling”, i.e. allocating low-emission products to carbon-regulating markets while shipping other, more carbon-intense products to unregulated markets. Incidentally, re-shuffling undermined the only existing CBAM, i.e. California’s border tax on electricity imports (Pauer, 2018). Choices should be made regarding the benchmark *level*, *number*, and whether it should differentiate between exporters based on their country of origin.

Adjustment price
Once the carbon content of a product has been determined, how should it be priced? Trade rules require equal treatment to domestic producers.

Border adjustment liability
Who will be required to pay for the carbon content of the imported goods: the producer or the importer?

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Exemptions
Goods from sectors, industries, or countries that impose adequate caps or prices on carbon emissions should be exempt from CBAM. Likewise, a case can be made for partial or full exemptions for least-developed countries.

Use of revenues
Revenues from CBAM are available for a variety of uses, including general state expenditure, or climate-related projects, or measures to alleviate the impact of climate policies on low income households, etc. However, it has been shown that, under CBAMs, the burden of climate policies is partly shifted to developing countries. Hence, dedicating at least part of the revenues to assisting developing countries may be a form of compensation that, in fact, also creates an incentive for these countries to adopt, or fund, their own climate policies.

Once all choices are made, each imported product will be required to pay a climate fee, aimed at levelling the playing field with domestic producers of the same goods. If the fee is set too low, the entire mechanism will make little (if any) difference. If it is set too high, beyond legal challenges, it might even create perverse incentives for foreign producers or importers, that may be induced to resort to even dirtier processes in order to reduce the cost of their products in order to offset the carbon levy.

Practical options

Given the constraints from international agreements and the existing climate policies, domestic and foreign, the EU has four options regarding the mechanism design. In fact, the price of CO_2 might be set through a tax (reflecting some estimate of the marginal social cost of carbon) or by linking the mechanism to the ETS.

If the former mechanism is to be preferred, the choice would be whether to impose a tax on imported goods while maintaining the current hybrid scheme of carbon pricing within the EU (with some products being subject to a carbon tax while others are part of the ETS); or launching a broader reform of Europe’s carbon pricing in order to transform the ETS into an EU-wide carbon tax.

Alternatively, the border fee might be linked to the ETS, either by extending the ETS to foreign producers or, more plausibly, to the importers. These might be required to buy allowances in the market, as domestic producers do, following the example of the aviation sector. This latter option seems stronger vis-à-vis WTO rules.

An inextricable trade-off?

A final note is related to the *outcomes* of the proposed CBAM. The discussion above was about either formal aspects, or the desired *domestic* or *environmental* effects. But a CBAM, if effective, would also result in potentially large changes in the competitive scenario. It would both promote a reallocation from imported goods to domestically produced goods, and among importers. A study performed by Aylor et al. (2020) showed that a well-designed mechanism might impose significant costs on EITE industries. For example, the potential profit reduction would be as high as 10% on semi-manufactured gold and bituminous coal, 20% on crude oil, 40% on flat-rolled steel products, and 65% on mechanical and chemical wood pulp. These are all intermediate inputs that are used by industries downstream, so the general equilibrium effects would be far from obvious: extra-costs might either be borne by the shareholders of the most heavily-hit industries, or fall upon downstream industries that may or may not pass them over to final consumers, or they may spur further reallocation. The same paper performs a simulation on two industries (crude oil and steel), showing that traditional exporters to the EU – such as Ukrainian and Chinese steel and Russian oil – might find themselves in a situation of a competitive disadvantage vis-à-vis cleaner competitors (such as Turkish steel-makers and Arab oil producers). European producers who rely on imports from these countries might either benefit or suffer from the new rules, either. Neither is it clear what the political and diplomatic reaction might be, if any.

All in all, CBAMs are a quintessential case where theoretical models are likely to diverge from real-world applications. CBAMs in theory are an effective tool to reconcile trade and environmental policies, insofar as they can level the playing field between domestic, carbon-constrained producers and foreign, unregulated ones. But, in practice, many simplifications, limitations, and proxies are to be adopted, that may significantly reduce the desirability of the adjustment mechanism itself. In short, an optimal CBAM is likely to be unfeasible in practice, and a real-world CBAM is likely to fall far short of the ideal model. However, even an imperfect CBAM may be an improvement over the current measures. It all depends on design issues, on the distributional impacts on specific industries and sectors as well as the whole economy, and, to some extent, on the potential reactions from carbon-intensive third countries.

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