BORDER CARBON ADJUSTMENT IN AGRICULTURE:

THEORETICAL THOUGHTS

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Summary

Many national climate policies are already using or planning to implement different carbon pricing schemes aiming to reach climate mitigation target efficiently. Inadequate international cooperation, however, can lead to emission leakage. To prevent this, several concepts of border carbon adjustment (BCA) have been developed for the energy sector. Despite the significant role of agriculture in global greenhouse gas (GHG) emissions and ongoing debates on agri-food carbon pricing, to date, there is no concrete BCA proposal for the agricultural sector. Our qualitative research aims to derive alternative agri-food BCA designs discussing on potential bottlenecks and suggesting solutions, while hypothesizing on potential effects of a BCA on GHG emission, trade balance, land use, and welfare. We conclude with outlining quantitative model-based research required to assess alternative agri-food BCA designs and to test the derived hypotheses.

Keywords

Climate change mitigation, trade policy, greenhouse gas emission, border tax adjustment, carbon tax.

1 Introduction

In the face of climate change, many national climate policies are already using or planning to implement different carbon pricing schemes aiming to reflect social costs of GHG emission and to reach their climate targets. Inadequate international cooperation, however, can lead to cross-country differences in carbon policies (HEITZIG et al. 2011; NORDHAUS 2015), under free trade causing so-called emission leakage, i.e., an increase of GHG emission abroad due to local GHG emission mitigation policy. BCA has not been practically implemented yet, except for the California's carbon cap-and-trade program for electricity (PAUER 2018), but proposals have been developed targeting carbon pricing of the energy sector. The EU also plans introducing a BCA for products covered by the EU Emission Trading System (ETS) (EU PARLIAMENT 2021). Since the agricultural sector differs from the energy sector in manifold aspects and because the agricultural sector is not subject to carbon pricing or other ambitious mitigation policies so far, extending a BCA proposal for the energy sector to agriculture is far from trivial, albeit some issues could be adopted. This study aims to analyse the state of art on BCA, assess the feasibility and applicability of BCA to the agricultural sector, and propose suitable BCA designs for the agricultural sector.

2 Theory and practice

BCA is rooted back to the concept of border tax adjustments (AUERBACH 1997). While carbon policy in the domestic market aims to reflect marginal social costs of GHG emission, the cost increase for domestic producers can shift domestic demand towards imported goods. The shift of production and related emissions to the exporting country are recognised as emission leakage. BCA is supposed to prevent this effect by adjusting the border import price by the domestic costs of the policy and thus levelling the playing field for the domestic and foreign producers. To this end, we distinguish between five elements to be defined for each BCA design: (i) climate policy, i.e., policy mix, tax base, and point of tax collection; (ii) countries or regions involved, i.e., existing agreements; (iii) sectors, i.e., trade balance, emission intensity and variability within sector, value chain complexity; (iv) emission, i.e., emission diffusion and measurement issues; (v) time, i.e., variability and stability of the components.

Despite ongoing debates on carbon pricing in agriculture (e.g., GREN et al. 2021), a BCA proposal for this sector is challenging, since BCA requires emissions to be quantifiable and administrated in a way that producers can avoid carbon pricing by investing in low emission technologies. In contrast to electricity, agriculture deals with very heterogeneous products. An accurate measurement of emissions is difficult, especially regarding diffuse pollution, e.g., nitrate oxide emissions on fields. In addition, agricultural supply chains are highly diverse and complex. Although the current Farm-To-Fork Strategy aims to shorten supply chains via direct marketing and regional production (EU COMMISSION 2020), many agricultural products are still involved in long supply chains spread around different regions or even continents. Tracking back total emission will increase bureaucracy, such that it is difficult to imagine such a system ever working. To overcome these issues, solutions outlined in existing proposals for energy can be adopted for a BCA in agriculture. For instance, ETS provides a market price for emissions and hence a reference point for quantifying BCAs at the border. In order to account for differences in emission through diverse production processes it is suggested to impose either average emission standards based on domestic data or maximum ones yet allowing producers to prove less emission via certificates (KORTUM and WEISBACH 2017). In addition, well elaborated up-to-date emission databases based on life-cycle analysis are crucial for applying standard coefficients. This would also allow to better account for double taxation, especially under scenarios when BCAs in multiple sectors exist. An understandable and transparent way of emission monitoring and pricing is also required in the context of the World Trade Organization (WTO) law. In principle, the WTO regime allows to restrict trade based on environmental considerations if measures do not arbitrarily discriminate between countries with similar conditions and are not used as a protectionist measure. Therefore, refund mechanisms for exports are crucial, while equal pricing of domestic production and imports are more likely to be WTO compliant. Proven environmental benefits might be one of the few options to increase tariffs above the committed bound rates.

3 Consequences for research and quantitative modelling analysis

Although both carbon policy and BCA in agriculture are not ready for practical implementation, it is useful to assess the feasibility of both using well established global and regionalized market models, such as MAGNET and CAPRI. In this regard, we aim to assess relevant combinations of domestic climate policy instruments underlying BCA, as well as different country aggregations, e.g., with and without political agreements. This quantitative analysis aims to assess trade balance, emission intensity and within-sector variability, as well as changes in consumer's and producer's welfare, land use change, adjustments in supply and its performance against alternative policy measures.

Assessing performance of a BCA design is far from straightforward. One needs to be aware of the channels of potential leakage effects, as well as of direct (e.g., from increased agricultural production abroad) and indirect (e.g., from transportation of food products produced abroad back to the home country) leakages. Furthermore, one should distinguish between reduction of leakage effects, which is the primary goal of a BCA, and reduction of total GHG emission, which is the primary goal of the underlying carbon policy. Assessment of the BCA designs with MAGNET and CAPRI also requires a common and rather medium- to long-term baseline with harmonised drivers. In addition, carbon accounting rules, related coefficients, and calculation algorithm need to be harmonized, in order to obtain valuable insights.

This proposal introduces research in progress. The intended results of the qualitative study are to discuss BCA designs for agriculture, as well as to formulate hypotheses for each alternative following the assessment criteria described above. Both will be presented in the poster. Follow-up quantitative research will deal with model-based assessment of the derived BCA alternatives and testing the hypotheses.

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