

# An investigation into the effects of border carbon adjustments on the Canadian economy

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*Discussion*

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# Existing (economics) literature on border carbon adjustments

- **Theory**

- BCAs are well understood theoretically (e.g., Markusen, 1975; Hoel, 1996) as part of optimal approach to sub-global climate policy.
  - Optimal unilateral carbon tariff is motivated by two factors:
    - **Environment:** one part to address carbon leakage
    - **Protection:** one part to address terms of trade

- **Empirics**

- Most empirical literature uses stylized policy experiments with CGE models (e.g., uniform carbon pricing within coalition).
- Finds that BCAs (e.g., Bohringer *et al.*, 2012; 2021) can reduce emissions leakage (by around a third to two-thirds: ~12-30%  $\Rightarrow$  ~4-15%).
- BCAs don't significantly improve global cost effectiveness of climate policy (e.g., Bohringer *et al.*, 2016). Instead: "the main effect of carbon tariffs is to shift the economic burden of developed-world climate policies to the developing world."

# Contribution of this study

- **This study:**

- Main contribution  $\Rightarrow$  Considers application of BCA in current Canadian context, with existing carbon pricing (useful!)
- Finds that BCAs can reduce carbon leakage (and may even render it negative)

- **Main suggestions:**

- Take the policy context even more seriously
- Think more carefully about legal and policy constraints to BCA implementation (model realistic BCAs)

# Take the policy context even more seriously

- Key contribution of this study is understanding application of BCA in a particular policy/country context
- Could be an important input to inform Canada's decision on BCA
- Should better line up model with Canadian policy setting

	<b>Currently modeled</b>	<b>Suggestion</b>
<b>Policy mix</b>	Endogenous carbon price to meet 40% emission reduction by 2030	Fixed carbon price plus: <ul style="list-style-type: none"><li>- Oil and gas emissions cap</li><li>- Zero emission vehicles mandate</li><li>- Low carbon fuel standard</li><li>- Clean electricity standard</li><li>- Industrial policy</li></ul>
<b>Coalition</b>	Coalition implementing BCAs	Canada acts alone (?)

# Implementation of BCAs would be difficult. Model *implementable* BCAs

## Federal context

1. Industrial carbon pricing within Canada is mostly implemented provincially
2. Provinces impose different policies
  - a. cap and trade (QC)
  - b. carbon tax (BC)
  - c. tradable performance standard (AB)
3. Carbon prices differ between provinces
  - a. Quebec ~ \$19/t; increasing at 5% per year
  - b. rest of Canada \$50/t; increasing \$15/t per year
4. Provinces implement different measures to avoid competitiveness / leakage impacts
  - a. rebates (QC)
  - b. discounted emission prices (BC)
  - c. implicit output-based rebates (AB)
5. Adjustments at the border would have to be applied federally. How? Not clear, but likely need to reflect *least stringent* provincial policy.

# Implementation of BCAs would be difficult. Model *implementable* BCAs

## Legality under trade law

1. OBPS is a regulation (as argued by Canada in Supreme Court decision)
  - a. OBPS already embeds implicit output rebate
  - b. Export rebate unlikely to be WTO compliant (Bohringer et al., 2022)
2. Appropriate tariff likely is lower than carbon price
  - a. Domestic emitters can comply through offsets and credit trade at prices below stated carbon price; need to allow foreign emitters same opportunities (Coseby et al., 2021)
  - b. Free permits are granted below threshold to domestic emitters; need to do same for foreign counterparts

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## Appropriate base for BCA application

- Foreign **firm** embodied emissions?
  - Creates incentives for reducing firm emissions
  - Difficult/costly to measure (need to measure embodied emissions in supply chain)
  - Creates incentives for reshuffling?
- Foreign **country** average embodied emissions?
  - Difficult to measure exactly
  - Provides no incentives for reducing foreign firm emissions
  - May not be WTO compliant (Fischer and Fox, 2012)
- **Canadian sector average** embodied emissions?
  - Easier to measure
  - Does not reflect foreign emission intensity
  - More likely WTO compliant
  - Provides no incentives for reducing foreign firm emissions

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## Cooperation with US

- a. Most EITE Canadian trade to (76%) / from (58%) US
- b. Carbon pricing unlikely in the US
- c. Politics/economics of applying tariffs on US imports are challenging
- d. Export rebates would almost certainly be challenged by US (Lilly et al., 2022)
- e. Most favoured nation: BCA cannot distinguish “like” products from different countries

# Implementation of BCAs would be difficult. Model *implementable* BCAs

- The economically optimal tariff is not likely possible - politically or legally - to implement
- The feasible border carbon adjustment is likely (much?) lower than the optimal tariff, and likely does not include export rebates
- Modeling the feasible tariff would provide useful guidance with respect to future decisions on border adjustments

## Additional results and questions

- How much of welfare gain from BCA is due to shifting terms-of-trade? Who pays?
- Are there incentives for retaliation? By whom? What are the consequences?
- What are the channels through which leakage occurs (fossil fuel channel/trade channel/factor market channel)?
- Why are leakage rates so low in the model? (1-2% vs. 12-30% in the literature?)