

Comments on Kellogg's "Economics of Demand-Side and Supply-Side Climate Policies"

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Four comments

1. CBAM and the clean energy subsidy
2. What is Λ in a trade model?
3. Which leakage rate to use?
4. Leakage is not the only gap

1. CBAM and the clean energy subsidy

No clean energy subsidy under the ideal BTA

US as "Home"	t_u	t_e	s_c	ΔE
Baseline	\$19	\$29	\$2	-0.88 Gt
+ ideal BTA	\$21	\$29	\$0	-0.93 Gt

Ideal BTA eliminates all leakage from trade in energy-intensive goods, hence

$$s_c^* = \phi \frac{\Lambda S_F^{R'}}{S_F^{R'} + S_C^{R'} - D_e^{R'} - \Lambda D_e'} \implies s_c^* = 0.$$

My first comment:

- (1) $s_c^* = 0$ survives the optimal BTA;**
- (2) but fails under the actual CBAM.**

From ideal to optimal BTA

Three margins: imports t_m , domestic sales t_d , exports t_x .

- **Baseline:** $t_d = t_x =: t_u$, $t_m = 0$ **production** tax
- **Ideal BTA:** $t_m = t_d =: t_a$, $t_x = 0$ **consumption** tax
- **Optimality:** $t_m = t_d =: t_a$, t_x free consumption + t_x

Kortum and Weisbach (2026) find that $0 < t_x^* < t_a^*$, with $\Lambda > 0$

Does this bring us back to $s_c^* > 0$? No!

From optimal BTA to actual CBAM

Regardless of t_x , optimum has

$$t_a^* + t_e^* + s_c^* = \phi$$

With $t_x = 0$ or free, $\uparrow t_a$ does not affect $t_x \implies t_a^* + t_e^* = \phi$

But actual CBAM $\implies t_x = t_a$, so $\uparrow t_a$ drags $t_x \implies t_a^* + t_e^* < \phi$, hence

$$s_c^* = \phi - t_a^* - t_e^* > 0$$

Add a row to Table 2 for actual CBAM with $s_c^* > 0$.

2. What is Λ in a trade model?

Leakage rate in trade model

Oil and labor; varieties CES with elasticity σ ; outside good sets w . Hold P constant to isolate *relocation* channel.

Split emissions by destination, $\mathcal{E}^H = \sum_r (\mathcal{E}_{d,r}^H + \mathcal{E}_{x,r}^H)$, let φ^H be the pass-through of $\uparrow P$ into prices, and let $\rho^H := \varphi^R / \varphi^H$:

$$\Lambda^H = \frac{\rho^H \Psi^H (\sigma - 1) \varphi^H}{\mathcal{E}^H + \Psi^H (\sigma - 1) \varphi^H}$$

where

$$\Psi^H := \sum_r (m_r^H \mathcal{E}_{d,r}^H + \mathcal{E}_{x,r}^H), \quad m_r^H := \frac{\mathcal{E}_{m,r}^H}{\mathcal{E}_{m,r}^H + \mathcal{E}_{d,r}^H}$$

Calibration and leakage rates

Apply formula with $\sigma - 1 = 5$, $\varphi^H = 0.15$ (Kortum–Weisbach), and $\rho^H = 1$, and OECD Greenhouse Gas Footprints, 2025 edition, 2022, 50 activities.

	ψ^H/ε^H	Λ^H	Kellogg's Λ^H
United States	0.287	0.177	0.10
European Union (27)	0.440	0.248	0.20

Paper's calibration in ballpark of Λ in a quantitative trade model.

3. Which leakage rate to use?

Export margin leakage

Under CBAM the import margin is border-adjusted, so does not relocate, hence

$$\psi^H \rightarrow \psi_x^H := \sum_r \mathcal{E}_{x,r}^H$$

	United States	European Union
Production tax ($t_d = t_x$) , Λ^H	0.177	0.248
Actual CBAM ($t_m = t_d = t_x$), Λ_x^H	0.070	0.132

Extending tax to imports removes about 60% of U.S. leakage and 47% of the EU's

$\Rightarrow s_c^*$ falls to about 40% of its baseline in the U.S., and 53% in the EU.

4. Leakage is not the only gap

Distortions and constraints

Retail markup $m \implies$ consumers pay $P + t_u + m \implies t_u^* = \phi - m$.

Wedge between clean and dirty energy must be $\phi \implies t_u^* + s_c^* = \phi$.

Borenstein–Bushnell: $m > \phi$ in much of the U.S. If $t_u \geq 0$

$$\implies t_u^* = 0 \quad \text{and} \quad s_c^* = \phi$$

Political constraints on carbon taxes

$$\implies t_u \leq \bar{t}_u < \phi \implies s_c^* = \phi - \bar{t}_u$$

Clean energy subsidies may need to be large!