

Frameworks for Evaluating Different Policy Approaches to Address the Competitiveness Concerns of Mitigating Greenhouse Gas Emissions

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Workshop on Addressing Competitiveness and
Leakage Concerns in a Carbon Tax: What are the Options?

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Competitiveness Frameworks

- Competitiveness Risks
- Risks from Competitiveness Policies
- Frameworks for Evaluating Competitiveness Policies

Competitiveness Risks

Economic Risks

- Pollution haven hypothesis
 - “Footlooseness”
- Defining competitiveness
 - Discern trade effects from regulatory compliance costs
 - Relative carbon price differentials

Economic Risks: Environmental Rules

- Competitiveness impacts of environmental rules
 - Ederington et al
 - Levinson and Taylor
- Greater response to within-US variation in regulatory costs
 - Greenstone
 - Kahn and Mansur
 - Deschenes

Economic Risks: Carbon Pricing

- Competitiveness impacts of carbon pricing
 - Aldy and Pizer *JAERE* 2015
- Estimate impacts of energy prices on net imports, production for ~450 industries over 35 years
 - Use these estimated elasticities to simulate net import impacts of \$15/tCO₂ price
 - Based on EIA estimate of energy price increases under a \$15/tCO₂ price

Estimated Impacts of \$15/tCO₂ Price

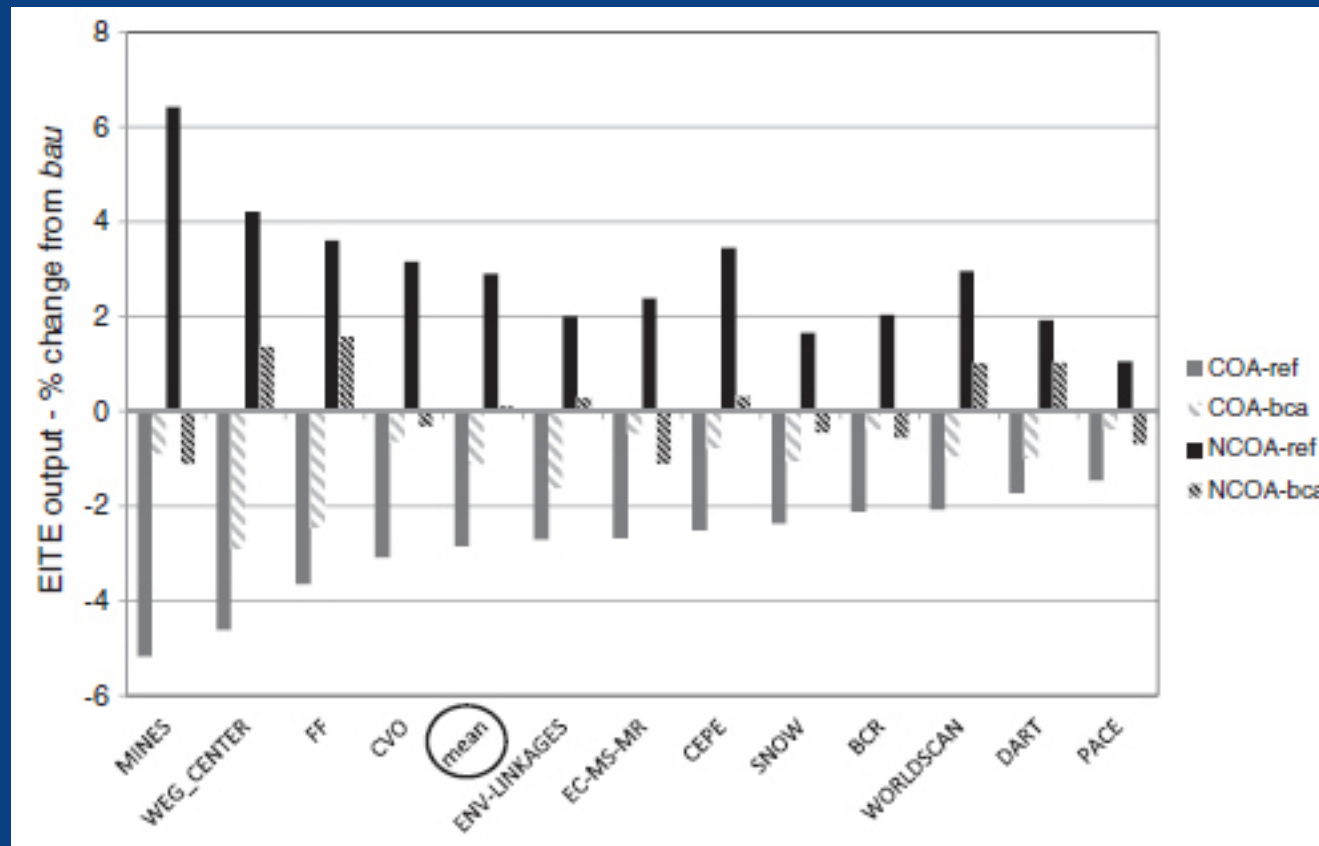
Table 5. Predicted Impacts of a \$15/ton CO₂ Price on Various Manufacturing Sectors

Industry	Energy Intensity (%) (1)	Production-Energy Elasticity (2)	Production Effect (%) (3)	Net Import Elasticity (4)	Net Import Effect (%) (5)	ΔNI as a % of Δ Production (6)
Iron and steel	5.39	-.27*** (.09)	-2.99 (1.03)	-.01 (.06)	-.13 (.68)	-.04 (.23)
Chemicals	10.47	-.35*** (.11)	-3.95 (1.20)	.02 (.06)	.28 (.72)	.07 (.19)
Paper	8.96	-.33*** (.10)	-3.73 (1.15)	.02 (.06)	.18 (.71)	.05 (.19)
Aluminum	23.51	-.46*** (.13)	-5.12 (1.46)	.07 (.07)	.77 (.82)	.15 (.17)
Cement	18.00	-.42*** (.12)	-4.74 (1.37)	.05 (.07)	.61 (.78)	.13 (.18)
Bulk glass	16.99	-.41*** (.12)	-4.65 (1.35)	.05 (.07)	.57 (.77)	.12 (.18)
Industry average	1.97	-.14* (.08)	-1.53 (.88)	-.07 (.06)	-.75 (.68)	-.49 (.53)

Economic Risks: CGE Models

- Ho et al. 2008
 - US \$10/tCO₂ price
 - Evaluate impacts over various time horizons
- Stanford EMF-29 Exercise
 - 12 multi-sector, multi-region CGE models
 - Base case: Annex I (excluding Russia) agrees to cut emissions to 2004 -20% (mean CO₂ price ~ \$40/tCO₂)
 - Evaluate economic, emission impacts with and without a border tax adjustment

EMF-29: EITE Manufacturing Output

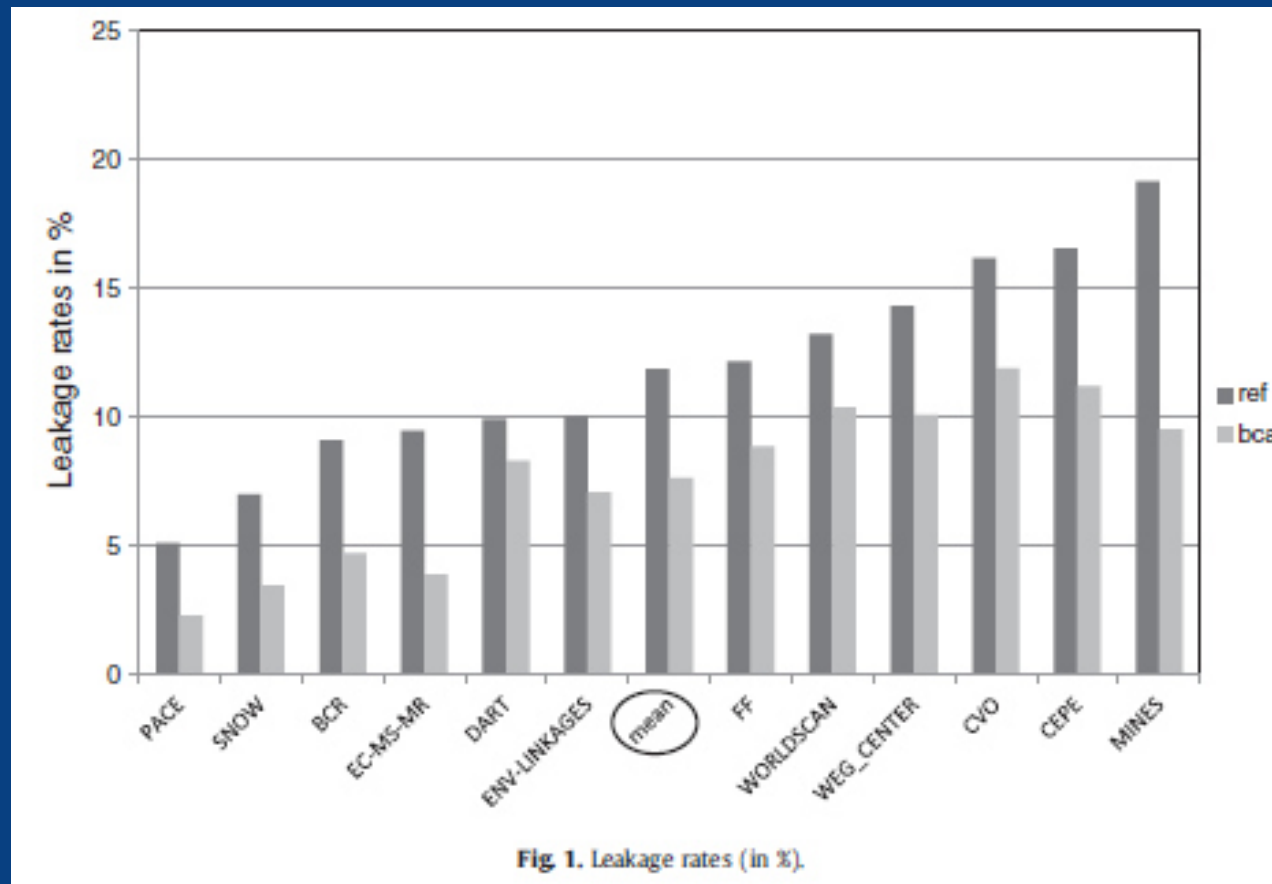


Source: Bohringer et al. *Energy Economics* 2012 (EMF-29 Summary)

Environmental Risks

- Two types of emission leakage
 - Competitiveness
 - World energy markets
- Potential to offset emission reductions in domestic mitigation program
 - Adversely impacts cost-effectiveness, reduces welfare

Environmental Risks: CGE Models



Source: Bohringer et al. *Energy Economics* 2012 (EMF-29 Summary)

Political Risks

- Basis for political opposition to carbon tax
 - From business
 - From environmental groups
- Importance of analysis and transparency
 - Avoid conflating competitiveness with compliance costs

Risks from Competitiveness Policies

Distributional Risks

- Forego opportunities to use revenues for other purposes
 - Transfers to low-income households
 - Tax reform (lowering marginal rates, corporate reform)
 - Supporting R&D
- Potential for excessive compensation
 - Waxman-Markey example

Efficiency Risks

- Output-based policies distort the carbon price
 - Domestic price wedges
- Complexity of policy instruments may undermine efficiency
- Prospect of trade retaliation in response to border tax adjustment

International Relations Risks

- WTO risks
 - Legality of border tax adjustment, output subsidies
 - Implications for ongoing trade talks
- Climate negotiations risks
 - Create a rift with developing countries (China?)
 - Alternatively, create incentive for developing countries to implement domestic C pricing (China?)

Framework for Evaluating Competitiveness Policies

Social Welfare Framework

- Maximize net social benefits
- Evaluating the benefits of competitiveness policies
 - Carbon price gap
 - Efficacy of policy instrument
- Administratively feasible tax policy
- Beyond BCA: WTO impacts, distributional impacts

Political Economy Framework

- Political revealed preference
 - Consider constrained political revealed preference
- Recognizes that competitiveness is more a political than economic issue
- How economic analysis can inform this framework

Conclusions

- Balance competitiveness risks with risks from competitiveness policies
- Economic analysis important to illustrate the potential magnitude of these two types of risk
- Applying both frameworks could inform real-world policy deliberations

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