



Competitiveness & Carbon Leakage

Focus on heavy industry

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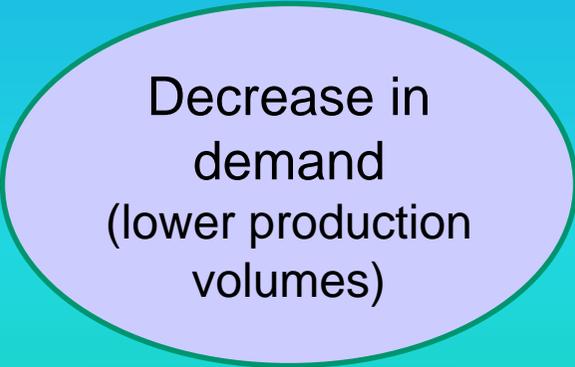


What is carbon leakage? a Sector's perspective

$$\text{Increase in emissions outside EU (as a result of the EU ETS)} \\ = \frac{\text{Decrease in emissions in EU (as a result of the EU ETS)}}{\text{Decrease in emissions in EU (as a result of the EU ETS)}}$$



Intended!



Demand Elasticity

Intended!

Leakage!



- Transport costs
- Capacity utilisation
- Barriers to trade
- Product differentiation
-



Carbon Leakage: literature review

Ex-ante

- **CO₂ tax: steel / aluminium / cement**
- **ETS: cement / steel / aluminium**

Ex-post

- **EU ETS: aluminium / cement / refinery**



Pass-through (i.e. price increase) is a core element

- **Ability or not to influence profits**
 - **Level of free allocation to maintain profit rates**
- **Impact on price competition and trade flows**
 - **Carbon leakage**

? Is opportunity cost pricing customary in industry ?



Impact on leakage: Ex-ante literature

		Pass-through	Assumptions	Leakage rates
Steel	Gielen and Moriguchi (2002)	100%	CO ₂ tax Japan and EU-15 •Border adjustment scenario	35% @ 10USD/tCO ₂ 70% @ 42USD/tCO ₂
Steel	OECD (2003) Maestad	Approx. 60% (endogenous)	CO ₂ tax OECD or EU-13 •Several tax scenarios •Armington elasticity	OECD-wide: 45% @25USD/tCO ₂ EU-13: 60% @40USD/tCO ₂
Cement	Demailly and Quirion (2006) *	75% (endogenous)	EU 27 •Different allocation modes	50% @ 20EUR/tCO ₂ *
Steel, cement, aluminium	Demailly and Quirion (forthcoming)	100%	EU-27 •Different allocation modes: incl. border adjustment •Armington elasticity	<u>Grandfathering/ Auctioning</u> @17EUR/tCO ₂ I&S: 30% (75% due to loss in market share) Cement: 20% (17% due to loss in market share) Aluminium: 30% (40% due to loss in market share)

* Authors admit that models used are not well suited to estimate carbon leakage rates



Ex-post impact assessment

- A common methodology is emerging: 
- Primary aluminium (IEA) Reinaud (2008)
 - No structural change in trade flows since EU ETS (even starting '04)
 - Saturated EU production levels / No projected capacity additions
 - High profits / long term electricity contracts still running
- Refinery sector (MIT) 
 - No structural change
 - Surplus of allowances
 - If impacts, high margins
- Cement (UCD and CIRED) 
 - Walker (2006) during the first year of the ETS: pass-through rates varying between 10-40% depending on countries and econometric assumptions
 - → Limits to this analysis: annual prices / observation of price movements over only 1 year !
- Overall conclusion:
 - What does today really tell us about tomorrow?
 - What is the counterfactual scenario?

Time dimension is of critical importance



Carbon leakage:

Monitoring the effectiveness of the scheme?

- Higher leakage rates are expected in the steel and primary aluminium sectors

- But even with free allocation, there may be leakage!

- How significant could this problem be?

- Elements to monitor pass-through should not be considered in isolation

- E.g. international competition (incl. trade restrictions), capacity availability, market structure, cost evolution, demand elasticity...

- A methodology is emerging that tracks carbon leakage :

- ◆ Pass-through / Profitability / Trade flows / Relocation

- ◆ **Pass-through is only ONE indicator to assess potential carbon leakage!**

**→ Do not speculate: simulate & monitor effects →
check theory against observations**

- EU sectors are not operating in a vacuum

- Carbon policy is only one part of the broader industry picture

- ◆ A high price environment blurs the effect of carbon policy cost



Thank you!

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Theory: competitiveness impacts & EU ETS

