COMPETITIVENESS ISSUES IN CLIMATE CHANGE POLICY – CONTRIBUTIONS FROM THE TRANSUSTSCAN (TSS) TEAM in association with the Centre for European Policy Studies

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Competitiveness in Unilateral Climate Policy: Border Tax Adjustments or Integrated Emission Trading?

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Agenda

- Motivation
- Results from Theoretical Approach
- Results from Simulation Analysis
- Conclusions

Motivation

- March 2007, **EU Spring Summit**: Commitment to a European Post-Kyoto regime, envisioning a unilateral reduction of greenhouse gas emissions by 20% by 2020 compared to 1990 level in the European Union or a reduction by 30% if other industrialized countries undertake similar efforts

- December 2007, **UNCCC (Bali)**: Roadmap to a Post-Kyoto Agreement, but no commitment of major industrial nations to binding emission caps

- December 2008, **UNCCC (Poznan**), or later: Multilateral agreement on emission caps – or sectoral agreements?

Case of unilateral actions in the EU:

What instruments may be used to offset the potentially negative impact on international competitiveness and to reduce leakage outside Europe?

- **European Parliament**: Border Tax Adjustments (BTA) for countries which are not bound by the Kyoto Protocol

- **European Commission**: Integration of the Importers into the European Emissions Trading Scheme (EU ETS)

Previous research

- How Border Tax Adjustments (BTA) might offset detrimental effects of domestic taxation on international competitiveness?
  - Bhagwati & Srinivasan (1973)
  - Meade (1974)
  - Grossman (1980)

- How Border Tax Adjustments (BTA) might be used to protect economies of carbon abating countries?
  - Ismer & Neuhoff (2004)
  - Babiker & Rutherford (2005)
  - Petersen & Schleicher (2007)

⇔ **Systematic analysis of Border Tax Adjustments (BTA) and Integrated Emissions Trading (IET) is not available**

BTA vs. IET

… corresponds to taxation of **domestic production** versus taxation of **domestic consumption**, i.e. to

Destination vs. Origin Principle.

Objections:

- Leakage: addressed by both policies
- Political Feasibility: Perhaps a problem, but…

"… Brussels is becoming the world's regulatory capital."

The Economist, Sep. 20, 2007

Theoretical Approach: Model

- Model extension of Böhringer and Lange (2005): General Equilibrium model with two countries *r*, i.e. *d* (domestic) and *f* (foreign)
- **Demand:** Differentiated demand for domestic and imported standard good in both countries: imperfect substitutes (Armington assumption)
- **Supply:** Each country disposes of *one* production technology
- **Production:** Representative firm chooses quantity and energy intensity *(costs of production are CRS w.r.t. quantity and decreasing in energy intensity)*
- **Emissions:** Energy intensity and quantities determine emissions

Abatement Policies

- All abatement policies are conducted ***only*** by ***domestic*** government
- Unilateral Abatement Policy (UAP): ***tax*** *(allowance price)* ***on emissions from domestic production****, such that they remain below emission cap*
- Border Tax Adjustment Policy (BTA): ***emission-based tax*** *(allowance price) (as under UAP), but put a* ***quantity-based tariff*** *on imports and pay a symmetric tax compensation on the exports*
- Integrated Emission Trading (IET): ***emission-based tax*** *(allowance price) on domestic firm producing for domestic market* ***as well as on imports*** *of foreign firm importing into the home country*

Results Theory: Energy Intensities

- BTA *lowers domestic energy intensity* (vis-à-vis UAP)
- IET *lowers foreign energy intensity* (vis-à-vis UAP)

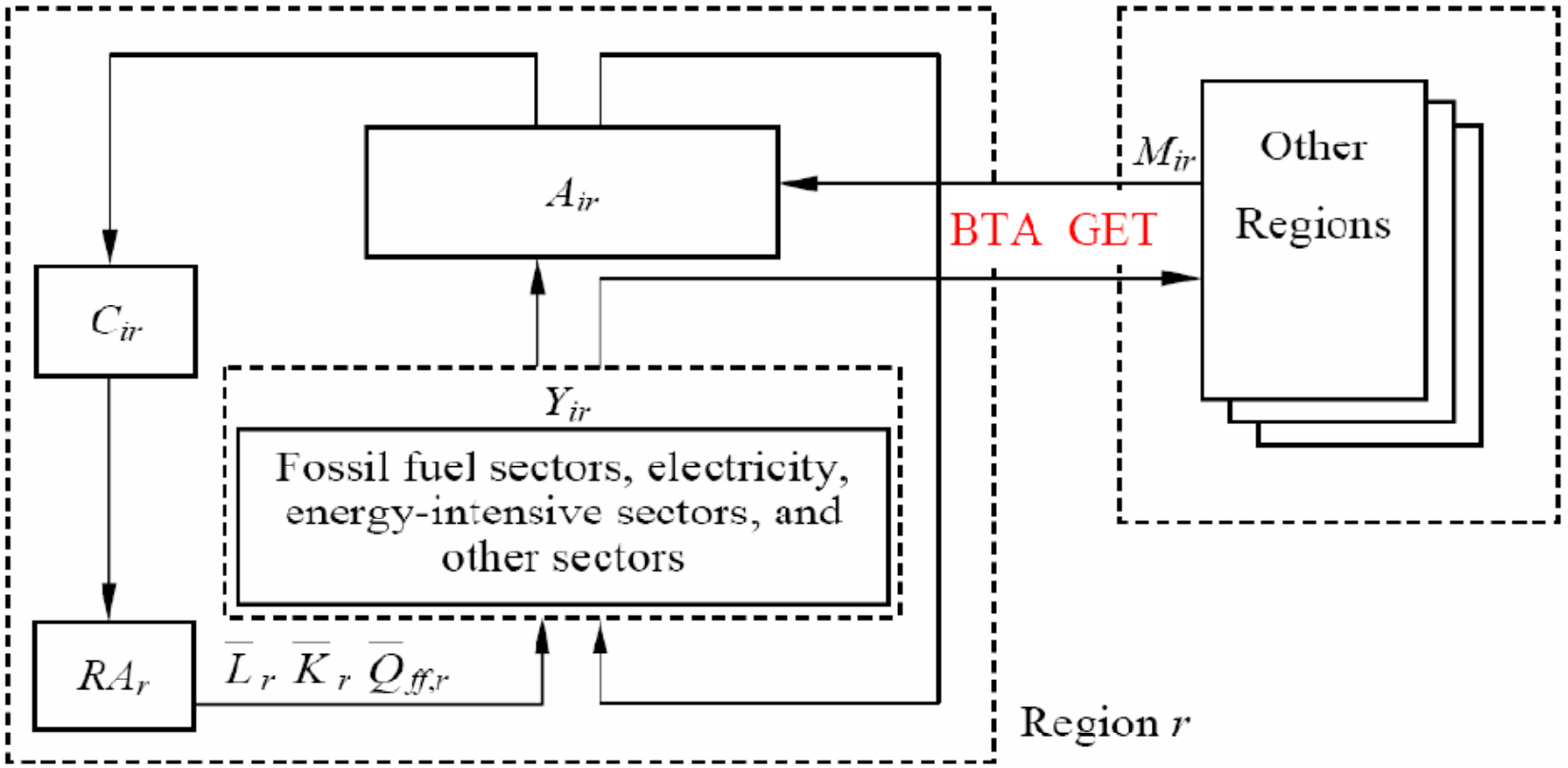
Results Theory: Comparison of Price and Output Effects

- BTA and IET *lower price of exports* (vis-à-vis UAP)
- BTA and IET *increase price of imports*
- Under BTA *domestic* output is higher than under IET and UAP
- Under BTA *foreign* output is lower than under IET only if marginal abatement costs in foreign country are much lower than in the domestic country ⇔ Assuming symmetry of cost functions or higher costs, *BTA induces higher foreign production than IET*

Results Theory: Comparison of Leakage

- Emissions in foreign country are reduced by both BTA and IET regime
- Assuming symmetry of cost functions (or higher abatement costs abroad), reduction is higher under IET

Simulation analysis: the CGE model PACE



Parameterization of Static PACE Version

- Data base of global economy: GTAP V6

Production Sectors	Regions
Energy-intensive sectors: Refined Oil Products, Electricity Iron and Steel Industry Paper Products and Publishing Non-Ferrous Metals, Mineral Products, Chemicals and Air Transportation *Non-energy-intensive sectors:* Rest of Industry (Other manufactures and services) *Other sectors:* Coal, Crude oil, Natural gas	EU-12 (New member states) EU-15 (Old member states) Rest of OECD Former Soviet Union Rest of South and Middle America China (including Hongkong) Rest of South and East Asia OPEC Rest of World

Policy Implementation

- EU-27: 20 percent cutback of CO2 emissions in 2020 compared to BAU
- Efficient implementation: Uniform taxation regime
- Sectors subject to the BTA and the IET regime: **EII** Sectors

  ⇔ Iron and Steel Industry

  Paper Products and Publishing

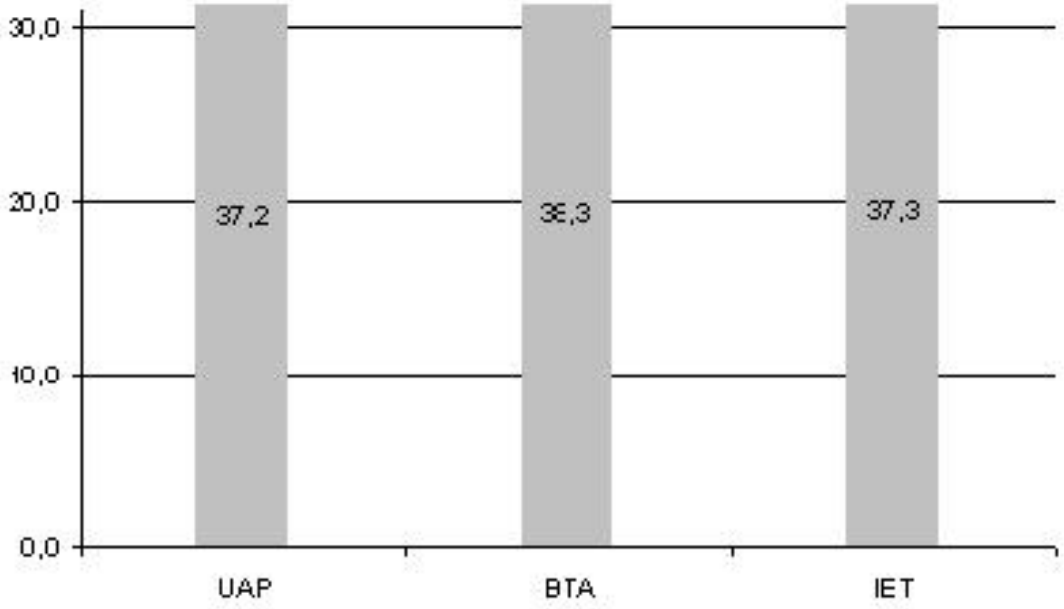
  Non-ferrous Metals

  Mineral Products

  Chemicals
- No carbon abatement outside the EU

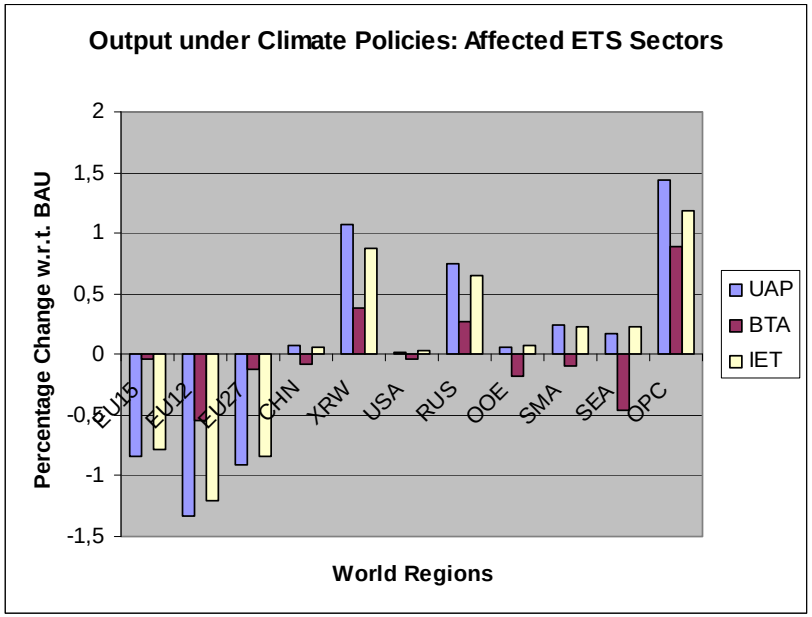
Simulation results: Carbon price

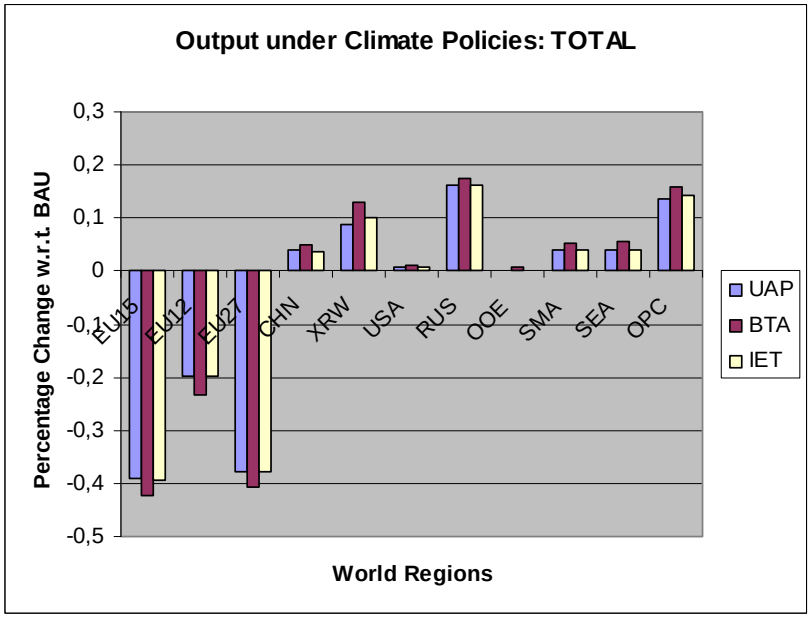
Emissions allowance price (in US$ per ton of CO2) in 2020



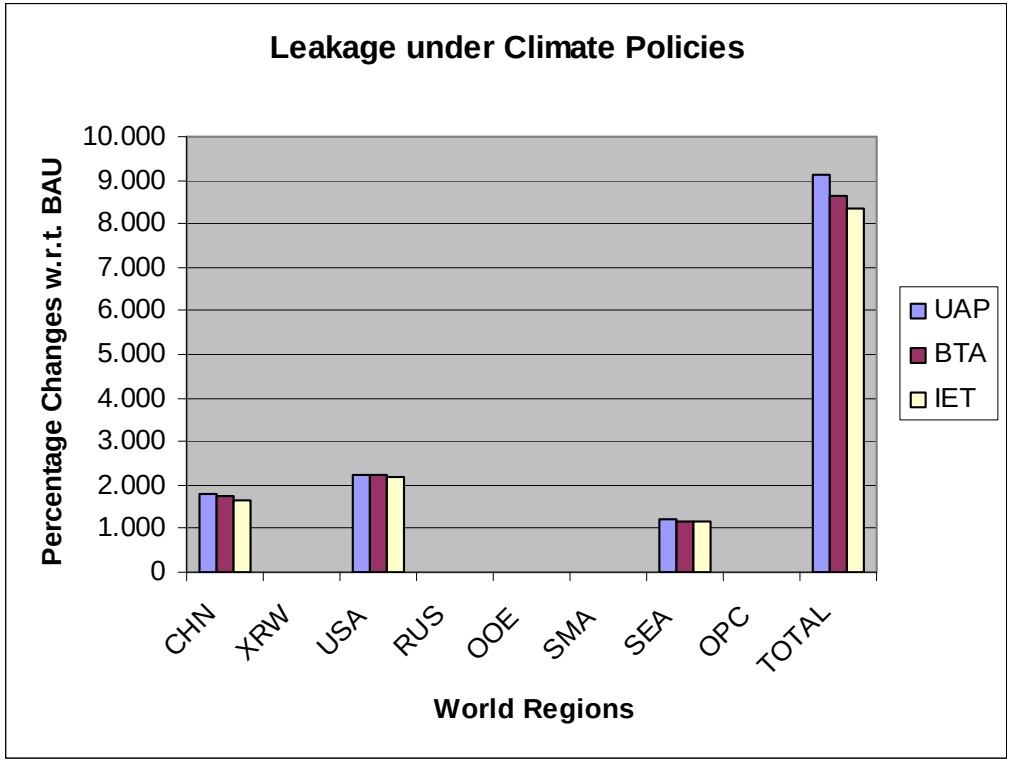
Countries with the BTA and IET regimes in energy-intensive sectors end up with higher marginal abatement costs compared to the unilateral abatement policy without any complementary measures

Simulation Results: Output Effects





Simulation Results: Leakage



Conclusion

- UAP causes leakage and a detrimental effect on EU sectoral competitiveness
- BTA and IET regimes are suitable to mitigate these *(sectoral)* problems
- BTA is more effective at protecting sectoral competitiveness than IET
- IET is more effective at reducing leakage in covered sectors than BTA
- CGE analysis confirms theoretical results *for affected sectors*
- Further insights: CGE analysis shows that *total* effects are *reversed*
- If BTA and IET are to be applied, change of paradigm necessary: Cap on emissions caused *by consumption*, not *by production*