Carbon-related Border Tax Adjustments
Work at OECD

Comments at
BROOKINGS CLIMATE CHANGE, TRADE AND INVESTMENT CONFERENCE
Washington D.C., 9 June 2008

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Outline

- Steel case study (Comments just on a few of the slides)
- (Cement case study)
- General equilibrium simulations
- BTA and WTO
- Main messages
- A few questions on the paper
Steel case study

- Used a partial general equilibrium model to analyse impacts of a tax of 25 USD per tonne CO₂ – applied in all OECD countries.
- The tax was levied on the steel sector and on the production of electricity used in the steel sector.
- Distinguished between Basic Oxygen Furnaces and standard Electric Arc Furnaces.
- The impacts were estimated within a short- to medium-term time frame – too short for any expansions in production capacities in response to policy shocks to be made.
- Much has changed within the steel sector since these simulations were made – consider only the qualitative findings; not the absolute magnitudes.
Impacts of an OECD wide tax

Production:
- OECD steel production declines.
- Partly offset by increased production in Non-OECD.

Emissions:
- Stronger impact on emissions than on production; cleaner in OECD, dirtier in Non-OECD.
- World emission reduction is significant (twice the decline in global production level).
Behind the figures: Substitution

- **Substitution** away from emission-intensive inputs and processes in OECD:
  - From ore/coal to scrap in BOF steelmaking.
  - From BOF to EAF steelmaking.
- **Higher scrap prices** dampen the degree of restructuring – as EAF use much more scrap than BOF.
Behind the figures: Tax incidence

The difference in net tax between BOF and EAF is surprisingly small, due to:

- Less input substitution in EAF steel.
- Higher input prices for EAF steel.
- EAF steel production is more price elastic.

Part of the net tax is borne by steel users, through higher steel prices.
Recycling of tax revenues back to the steel sector (or distribution of free emission permits)

Policy:
An OECD-wide tax of 25 USD per tonne CO₂ combined with a 100% refund, allocated based on actual output
- Uniformly across steel producers
- Differentiated between steel technologies

Results:
1. BOF production: Recycling has a big, positive impact.
2. EAF production: No impact with differentiated share (output subsidy outweighed by higher scrap prices).
3. Uniform allocation induces strong restructuring towards cleaner technologies.
Without any revenue recycling, an OECD-wide tax would reduce OECD emissions from the sector by some 19% and global emissions from the sector by 4.6%.

Revenue recycling reduces the global abatement significantly – to about 3%.

Uniform allocation is better for the environment than differentiated schemes – as it favours EAF production.
Border tax adjustments: Production effects

Policy:
An OECD-wide tax of 25 USD per tonne CO\textsubscript{2} combined with import taxes plus export subsidies based on Non-OECD emission levels (difficult to implement!):

Results:
1. Much smaller reduction in OECD production level.
2. Non-OECD production declines as well!
Global emissions decline more than without border taxes (despite substantially higher OECD production).

- Due to significant abatement in OECD (substitution towards cleaner inputs and technologies).
- Carbon leakage is eliminated.

“Ideal” border taxes seem better for the environment than revenue recycling – as the recycling provide output subsidies.
Cement case study

Simulated a CO$_2$ tax or an Emission Trading Scheme with auctioned allowances implemented in the Kyoto Protocol Annex B countries that have ratified it, assuming a CO$_2$ price of 15 euros per tonne.

This was combined with two BTA versions:

- In the “Complete BTA” scenario, exported production was completely exempted from the climate policy and imports of cement from the rest of the world were taxed in accordance with the CO$_2$ intensity of the cement production in the exporting country.
- In the “WTO BTA” scenario, exports benefit from a rebate corresponding only to the least CO$_2$ intensive technology available at a large scale, and imports are taxed to the same level.

Production in 2010 compared to BaU

Annex B Non Annex B World
Mt of cement
No BTA Complete BTA WTO BTA

OECD OCDE
CO₂ emissions in 2010 compared to BaU
The simulations above have been *partial equilibrium* simulations – looking at options to limit any negative impacts of non-global carbon policies on the competitiveness of single sectors.

OECD is currently doing simulations of the impacts of BTAs using a *general equilibrium* model (ENV Linkages).

Three main sources of leakage related to a non-global carbon policy:

- Though impacts on the competitiveness of energy-intensive sectors
- Through fossil fuel markets: Lower demand for fossil fuels in the “coalition” would lead to lower fuel prices – and higher fuel demand – outside the “coalition”.
- Through foreign direct investments *(Not covered in ENV Linkages)*

Very preliminary findings indicate that the most important leakage *normally* would stem from the *fossil fuel markets*. 
But the amount and sources of leakage, and the impacts of BTAs, would depend on the size of the “carbon coalition”.

- With few participants (e.g. EU alone), total leakage would be important, the competitiveness component would dominate, and BTAs could have relatively strong impacts (both in terms of emissions and cost increases).
- For a broader coalition (e.g. all of Annex I), total leakage would be less important, but it would be dominated by the impacts through the fossil fuel markets – and BTAs would have small effect.

The estimated leakage also depends on the number of GHGs covered in the analysis.

- Leakage is lower when non-CO$_2$ GHGs are included in the analysis – until the low-cost abatement options for the other gases have been exhausted.
A chapter in our 2006 publication *The Political Economy of Environmentally Related Taxes* looked at BTAs in relation to WTO rules.

A description – not an “OECD interpretation” of WTO’s rules.

Addressed *inter alia* the BTA provisions in the US Superfund and ODS taxes, which have been accepted.

The chapter concluded that *only a WTO panel could decide* on whether any concrete application of BTAs in a carbon context would comply with WTO’s rules.
Main messages

- BTAs have in theory the potential to limit negative impacts on sectoral competitiveness of ambitious GHG policies.
- However, in a general equilibrium setting, the carbon leakage related to the competitiveness of individual sectors can be relatively unimportant – leakage through fossil fuel markets would normally matter much more.
- Hence, BTAs should be considered as a last resort.
- The focus should instead be firmly fixed on achieving an ambitious international approach, with participation by all the major emitting countries and sectors.
- If BTAs one day should be considered further, a major problem would be their administrative costs.
- There is also a real danger that BTAs would trigger tip-for-tat retaliations.
- We need to look for environment and trade policy options; not environment or trade. BTAs could take us in the wrong direction.
A few questions on McKibbin & Wilcoxen’s paper

- Which were the oil price assumptions in the baseline?
- Which were the impacts of the scenarios on oil price?
- Which shares of the leakage in the policy scenarios stemmed from:
  - The fossil fuel markets
  - Changes in competitiveness of energy-intensive sectors
  - Foreign direct investments
- Which greenhouse gases were included?
- Why is there 0 impact of an uncompensated US tax on carbon emissions in China and India?