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Fair, Optimal or Detrimental? Environmental vs. Strategic Use of Border Carbon Adjustment

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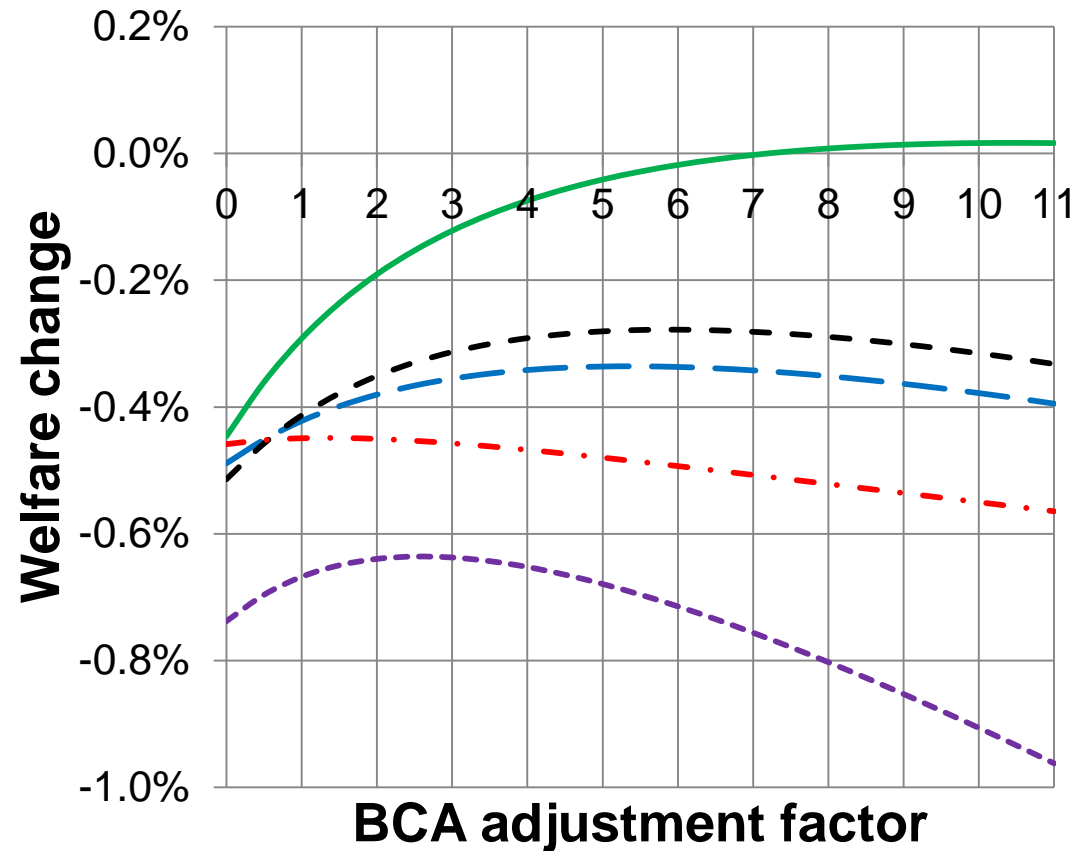# Environmental/Strategic Motives for BCAs

- Two motives for BCAs:
  1. Influences terms of trade in Home's favor – given monopolistic power on international markets
  2. Internalizes negative environmental externality caused by Foreign's export production

- Relative importance of (1) and (2)?
  - The 1. term creates incentive to misuse the 2. aspect
  - Uncertainty in Foreign's carbon intensities of commodities might lead to harmful, wrong tariffs
  - Pre-existing tariffs
  - Differences within coalition / non-coalition

DART model scenarios

- Recursive dynamic model with yearly steps
  - savings/investment (exogenous savings rates)
  - exogenous labor supply

- Calibrated to approximately match GDP and CO_2 emissions of OECD Environmental Outlook 2012

- Climate policy
  - Starts in 2010
  - Linear reduction to target in 2020 (20% below 2005 emissions)
  - Coalition members EUR, USA, RA1
  - Full standard/"fair" BCA rates based on carbon content (direct + electricity)

- Deviations from standard BCA rate: Multiplication with a constant factor

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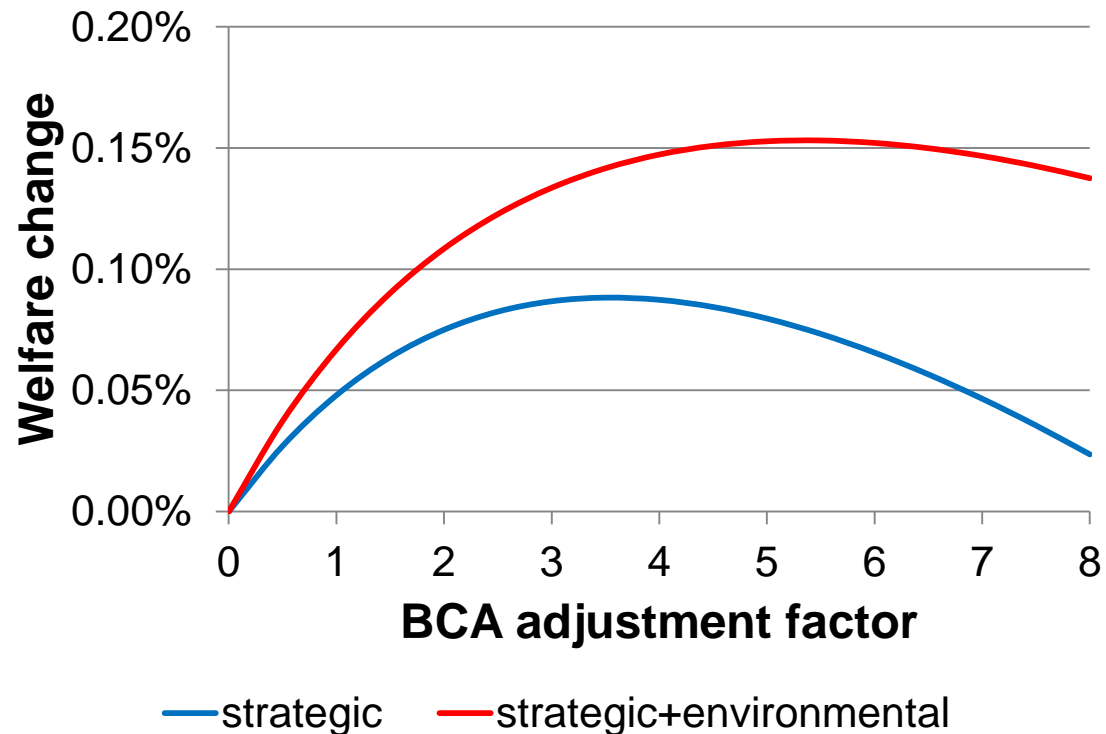
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Incentives to deviate from fair rate

- Different losses without BCA (adjustment factor = 0) for coalition regions

- All members of the coalition have an incentive to set rates well above the „fair" rate (adjustment factor = 1)

- Typical „optimal tariff" picture: inverted U shape

- Optimal rates are different for the member countries in the coalition, RA1 having the lowest, EUR the highest

- Global welfare is maximized slightly above BCA adjustment factor of 1
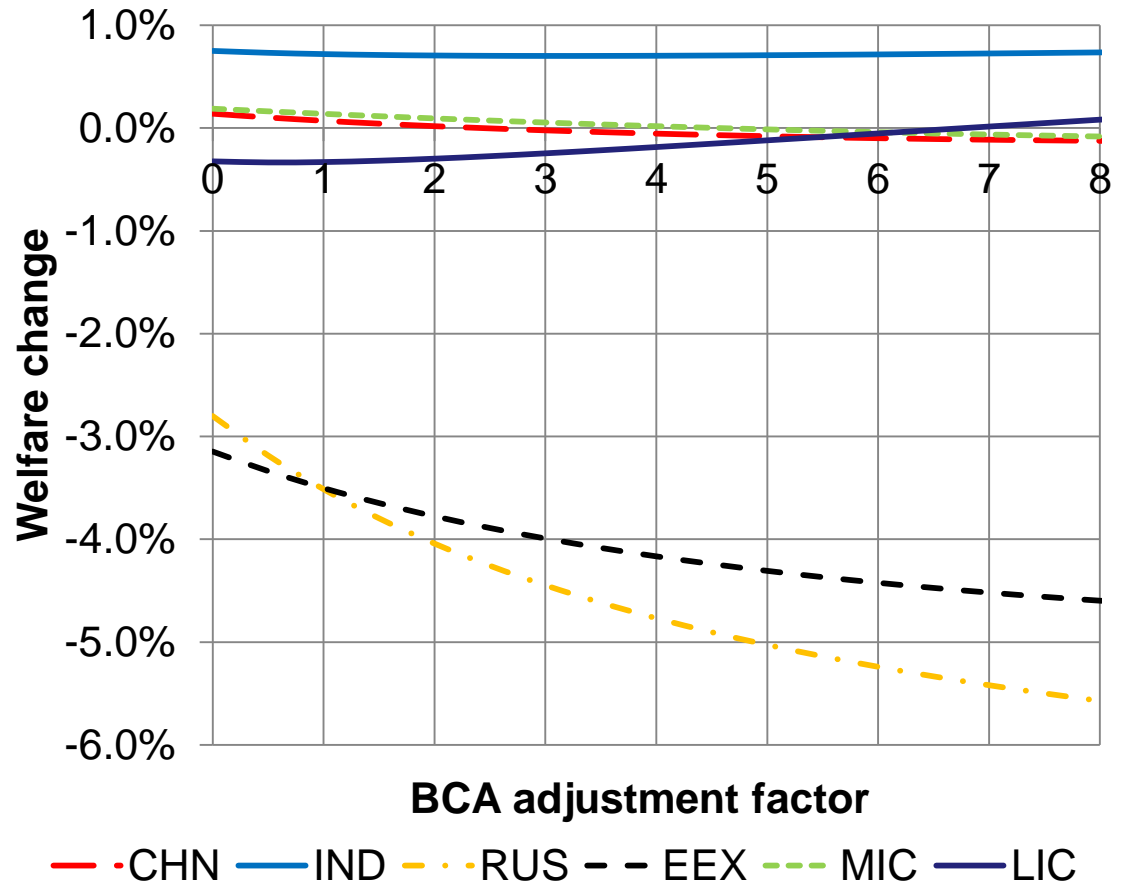

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Environmental vs Strategic Motive

- Decomposition in
  - strategic effect (terms of trade)
  - environmental effect (decreased leakage)

- Environmental effect can be switched off by not allowing coalitions to emit more at home when leakage is reduced abroad

- Effects shown for US: Strategic effect dominates at standard BCA rate

Effect on non-coalition welfare

- High and increasing losses in energy exporting regions (RUS, EEX)

- Changes for most other countries (CHN, IND, MIC) relatively small, not very sensitive to deviations from standard rate

- LIC gains from higher tariffs due to trade diversion effects

- Usually welfare minimum after which a further increase in the border measures improves welfare

BCA adjustment factor

CHN — IND — RUS — EEX — MIC — LIC

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Coalition forming

- Can the coalition use the strategic motive to induce participation in a larger climate coalition?

- How high are the tariff rates that are necessary to induce certain countries (such as China) to join the climate coalition or to achieve a global coalition?

- If BCA brings countries closer to joining a coalition, what is the "value" of a credible BCA threat?

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Incentives to join a global regime (1)

- Comparison of a fragmented regime with BCA and a global regime (with globally harmonized carbon tax)

- Global regime is better for some non-coalition regions: Energy exporters and Russia

- Higher than standard BCA rates are not very powerful to induce participation:
  - For MICs and China, only very high rate leads to indifference
  - For India and the LICs there would be *no* rate high enough to reach indifference

- Global tax more efficient, can the efficiency gains be used to induce participation?

	Welfare of global regime rel. to BCA	Necessary BCA rate for indifference
CHN	-0.2	10.0
IND	-0.8	/
MIC	-0.2	6.6
LIC	-0.2	/
EEX	1.9	---
RUS	2.3	---
USA	0.4	-
EUR	0.4	-
RA1	0.6	-
World	0.3	-

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Incentives to join a global regime (2)

- Compensation for all countries to be at least indifferent with the BCA scenario (red cells)

- Highest payments to India and China

- Without credible threat of a BCA scenario, compensation payments would be higher (numbers in parenthesis)

- Largest savings from BCA threat come from lower payments to China and the MICs

- Despite payments, coalition countries still better off compared to the BCA case due to inefficiency of a fragmented regime

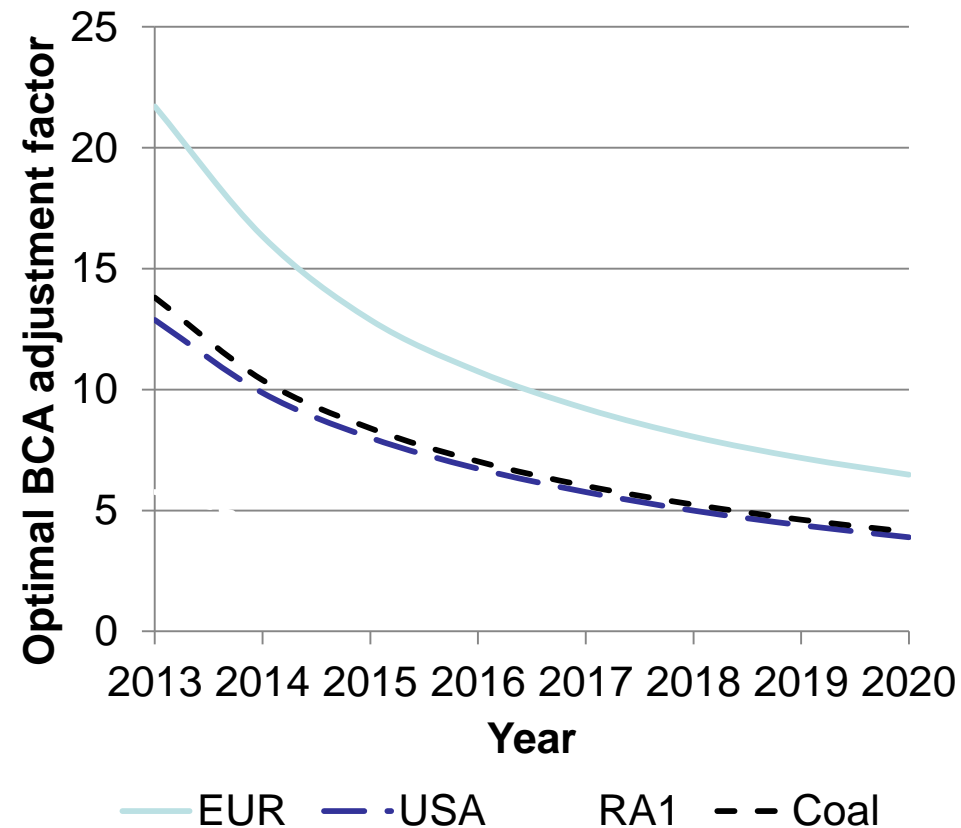|	Welf. change rel. to BCA in %	Welf. change rel. to BCA in %	Surplus allowances in Mt CO_2 p.a.		Cumulative Value of transfers in bill. US-$	
CHN	-0.2	0.0	810	(1076)	48.0	(63.7)
IND	-0.8	0.0	770	(798)	45.6	(47.3)
MIC	-0.2	0.0	482	(603)	28.5	(35.7)
LIC	-0.2	0.0	77	(79)	4.6	(4.7)
EEX	1.9	1.9	0	(0)	0.0	(0.0)
RUS	2.3	2.3	0	(0)	0.0	(0.0)
USA	0.4	0.3	-713	(-852)	-42.0	(-50.5)
EUR	0.4	0.3	-713	(-852)	-42.0	(-50.5)
RA1	0.6	0.3	-713	(-852)	-42.0	(-50.5)
World	0.3	0.3				

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Conclusions

- Regions are differently affected by deviations from the standard BCA rate:

  - Energy exporters are particularly sensitive

  - India (and China) show little variation

  - Coalition countries gain from too high BCA rates

- For coalition, strategic effect (terms of trade changes) dominates the environmental effect (gains from reduced leakage)

- BCA is not a able to induce a grand coalition when applied by itself

- A global regime can be designed in which all regions prefer a global regime to a fragmented regime with border measures

  - Transfers are needed for India and China to join

  - The threat of the BCA can reduce transfer payments substantially

Thank you for your attention

Backup slides

Incentives to deviate from fair rate

- Variation of welfare maximizing BCA rate over time

- Initially adjustment factors very high because carbon prices are low

- As carbon prices rise, adjustment factor decreases

- In 2020, higher than fair rates still preferred in the coalition

Incentives to deviate from fair rate (EU)