

CLIMATE CHANGE POLICY: A NEW INTERNATIONAL ARCHITECTURE

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Jean Tirole



- ✓ From Kyoto (1997) to Copenhagen (2009), striking contrast between
 - ambitious targets for ... 2050
[in conformity with IPCC's objectives]
 - very modest commitments for 2020.

- ✓ What should roadmap be?

Outline

I. *The cost of delaying negotiations*

II. *Let's dream: An all-encompassing agreement*

Design under an efficient international governance:

- ✓ institutions built around economic instruments (key role of cost minimization)
- ✓ commitment problem.

III. *International political economy*

- ✓ compensation
- ✓ piecemeal policies affecting incentives to join an agreement (CDM, BTA,...)

IV. *Roadmap for future negotiations*

I. THE COST OF DELAYING NEGOTIATIONS

Copenhagen: The waiting game goes on...

Vague promises cannot be trusted.

What will happen before a binding agreement is reached?

- *Free riding*: excessive emissions in the meantime
[exacerbated by leakage problem: goods, plants, oil,...]
- *Strategic moves* in the anticipation of future negotiation
[Beccherle-Tirole 2010. Related work by Harstad 2009.]

ON FREE RIDING

(a) Some regional initiatives, though

[China, India, Mexico, Brazil,... ETS systems in Europe, USA, Japan,...]

- collateral damages (CO_2/SO_2)
- some internalization by very large countries (China)
- placate public opinion at home, avoid international pressure (double signal).

(b) Metric? How do we know whether such actions achieve 20% or 80% of what should be achieved?

(c) Screening: countries which intend to abide by their promises would benefit from binding agreement.

Strategic moves: *failure to reduce tomorrow's abatement cost*

- technological feasibility set

[green R&D]

- installed base of polluting equipments (including housing, transportation)

[standards, current investments in power plants, early actions to phase out polluting equipments, etc.]

- domestic allocation of property rights

[forward or bankable allowances]



Three strategic effects...

effect:	most potent when:
brinkmanship [high pollution if negotiation breaks down → extract more surplus]	bargaining power high
effort rebalancing [high pollution if negotiation breaks down → reduce investment today]	bargaining power low
raising rival's cost [convex environmental cost <i>or</i> leakage → Cournot-like issuance of emissions permits]	bargaining power low

... concur to generate high *post-agreement* pollution.

Tomorrow's pollution

- is always increased by delays in negotiation,
- can even exceed level that would prevail if negotiations were infeasible tomorrow

[lack of negotiation tomorrow would increase pollution, but would eliminate brinkmanship effect.]

Will the anticipated merger of regional ETS suffice to eliminate future pollution?

- forward allowances
- bankable allowances

[Waxman-Markey]

II. DEFINING A TARGET DESIGN

(1) Price coherency: one price

- worldwide
- identical for all sectors
- consistent across time

SIMPLE AND EFFICIENT

Some first implications

- no sectoral discrimination; in particular no distinction based on likely speed of accrual of carbon-free substitute technologies or on elasticities of demand,
- environmental taxes, standards and permits must reflect the same carbon price.
- Uniqueness should also apply to subsets of actions.
Example: Need to introduce market mechanisms for renewable energy targets and standards
 - e.g., 20% European target for 2020
 - car standards.
Improve current flexibility mechanisms.]

Remark: Carbon price does not suffice...

- ✓ Other market failure: spillovers of private R&D
 - R&D very important (key to climate change mitigation)
 - spillover rate more or less important than in other sectors?
- 2 targets require 2 instruments → need for R&D subsidy on top of carbon price.
- [endogenous growth models, e.g., Acemoglu et al 2009, Grimaud-Rouge 2008].
- ✓ Very long-term R&D: international, public consortia? PPPs?

(2) Arguments in favor of cap-and-trade

- ✓ *Economics*: lower informational requirements (targeted emissions reduction)?

- ✓ Mainly *political economy* considerations:
 - verification requirements (actual collection, and no undoing of tax)
[permits: suffices to measure country's emissions]

 - compensation
[no trust in fiscal promises]

 - legal reasons
[Europe's unanimity rule for taxes]

 - commitment/visibility
[if taxes set every year]

Promote good cap-and-trade policies

- ✓ Avoidance of distortionary rules
 - no free permits for new entrants/projects,
 - no loss of permits in case of shutdown.
- ✓ Auctioning of permits
[(1) no precedent for future grandfathering; (2) avoids windfall profits]
- ✓ Bankability



(3) Long horizon (30 years?)

[SO₂: 30 years; ETS system for CO₂ in Europe 2005-2007, 2008-2012, 2013-2020.]

✓ Need for *long-term visibility* for

- deployment

[lifetime: 20 to 60 years for power sector; buildings; transportation; forestry; etc.]

- R&D

[long lead time: carbon capture and sequestration, 4th generation nuclear power, hydrogen cells, electricity storage, agriculture and technologies that are robust to climate change, new biofuels for airlines, PV, etc.]

- risk management

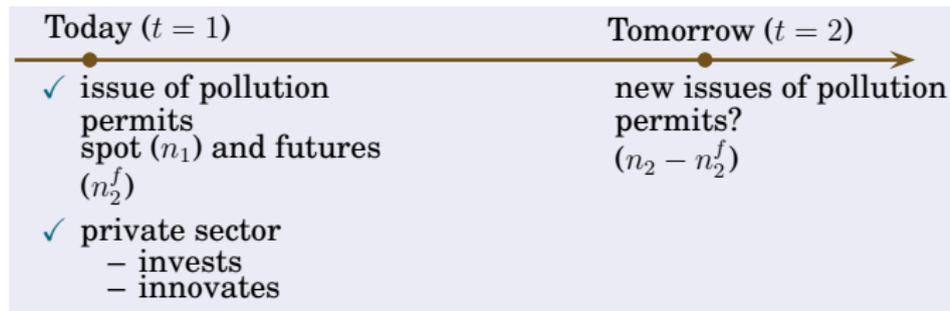
[can exist in “0-net supply”, but less liquid market]

(4) A reasonable amount of commitment to carbon price

Debate seems wrong-headed: too focused on safety valve
(price cap)

[(1) Some volatility is justified. (2) If price fluctuations are the concern, bankability, market monitoring, and hedging markets may help. (3) However, borrowing may be dangerous (strategic complementarities as in Farhi-Tirole 2009)].

Need for a price floor (possibly an adjustable one).



Incentive for the authorities to flood the market tomorrow:

- collect auction income,
- give in to industry's request for new permits,
- expropriate innovators (lowers licences' prices by increasing number of permits).

Building credibility: put options

[Laffont-Tirole *JPubE* 1996a,b.]

- Plain vanilla options: Authorities commit to purchase at floor price.
- Criticism: uncertainty (scientific, technological, social, geopolitical)
- Optimal policy: provide authorities with flexibility, provided that the latter commit to compensate permit owners (in cash or Treasury securities).

[Example : at 40 €, some options in the money
at 35 €, some other options also in the money
etc.]

(5) Enforcing the agreement

[Not easy. WTO: exclusion is costly. Not so for global warming]

✓ *Monitoring compliance/enforcement*

- withhold/freeze some of the countries' endowment of futures and use conditionality?
- WTO sanctions?
- naming and shaming?

✓ *Monitoring indebtedness*

[role of IMF. Countries may sell too many permits in futures market.

Similarly, they may not be willing to honor their hedging commitments.]

III. COMPENSATION / NEGOTIATION

Compensation

- Financial transfers (to G77, green fund, etc.) transparent and unrealistic.
- Historically, compensation at national or supranational levels has operated through the allocation of permits.

Difficulty: some conflict between Realpolitik and ethics

- ✓ Developing countries need to grow, will incur 75% to 80% of cost of global warming.
- ✓ Getting countries on board requires allocating permits to countries:
 - with high marginal abatement cost, which have exerted little effort in the past,
 - with high projected per-capita consumption
 - which will not be much affected by global warming.

Subsidiarity principle: delegate domestic allocation of permits to countries

- externality = country's total emissions
- political economy

[need to get governments on board.]

There will be *improper domestic policies* (corruption, capture and sectoral policies, command-and-control, etc.) including in developed countries:

- French carbon tax

[set at 17 € for those not subject to EU ETS system; truckers, farmers, fishermen, etc. largely exempted; by contrast Constitutional Court rejected carbon tax as designed, and called for double taxation of industries subject to ETS!]

- Waxman-Markey bill in US

[example: free permits passed through to electricity consumers].

The transition: putting pressure to get on board

Country i will get on board if:

$$\underbrace{i\text{'s welfare on board}}_{\text{affected by allocation of permits or of auction revenue}} \geq \underbrace{i\text{'s welfare outside the agreement}}_{\text{affected by signatories' pollution targets, sectoral policies, project-related policies (CDM,...), etc.}}$$

1) *Clean Development Mechanism (per project approach)*

[allows investors in Annex I countries to subsidize [Kyoto-signatory] LDC projects that lead to a reduction of GHG emissions, in exchange of CERs]

Benefits

- additional development aid (way too little)
- market-based approach that may take advantage of low marginal abatement costs in South.

Drawbacks

- transaction costs, additionality criterion.
Counterfactual: no project? no CDM?
- general equilibrium effects (forestry)? How comprehensive is the policy?
- incentive to keep high-pollution equipments in operation and not to enact environmental regulations,
[capture and destruction of HFC-23 in China]
- reduced incentive to join international agreement.

2) Border tax adjustment (1)

Provides incentives:

- solves leakage problem (but not overall pollution problem of non-Kyoto countries)
- puts pressure on low carbon price countries,

but drawbacks:

- protectionism
[unilateral moves in general have little appeal]
- measure of carbon content of imports? Based on average emissions in exporting country's industry?
[no BTA if can demonstrate virtue? But if mere substitution...]

Border tax adjustment (2):

Addressing some concerns about protectionism:

- under supervision of independent agency or WTO?
- economic justification for taxes. For example coherency with permit price p .

Yet:

At best a pis-aller. Significant costs to be expected.

3) Sectoral agreements

✓ Bottom-up sectoral targets

[Bali Action Plan]

- allow LDCs to earn CERs,
- no-lose targets (no sanction if not attained)
- can obviously be duplicated in overall agreement.

Argument is that approach breaks the problem into pieces.

✓ Drawbacks

- sectoral lobbying
- requires N international agreements
- how coherent is overall solution?

IV. SUMMING UP AND A ROADMAP

✓ *Define a target*

- Economics provides much guidance about design. Yet “command-and-control” mechanisms keep resuscitating.
- Separation between allocative efficiency and redistributive concerns: use proceeds of auction to bring reluctant countries on board.

✓ *Pre- and post-agreement gaming*

- Apply least-cost pressure on non-signatories, while avoiding self-serving moves by signatories.
- Expect substantial gaming during transition.

Negotiations have stalled, with potentially dramatic consequences. Instead of looking for inefficient patches (sectoral standards, regional markets, extension of CDM, BTA, ...), agree on short-term actions, and

- (1) an agreement on a good governance:
 - a path of CO₂ emissions
 - a worldwide CO₂ market
 - a governance (carrot and stick)
- (2) a satellite emissions tracking system, to measure country emissions,
- (3) a negotiation process.

Abandon CDM at 2015/16 horizon.

In current circumstances, would already be a big success.