Climate Change: Policies and Political Economy

ESCAP/WTO ARTNeT Capacity-Building Workshop
for Trade Research

In Collaboration with National University of Lao

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The Political Economy

Policy Instruments
The Role of Uncertainty

The Choice of Policy Instruments

- Taxes on carbon (price-based mechanism)
- Permits to emit carbon (quantity-based mechanism)
- Cap and trade
- Subsidies for GHG mitigation (abatement and adaptation)
- Regulation
- Hybrid approaches
- Target production or consumption?

Taxes, Permits and Specific Regulation

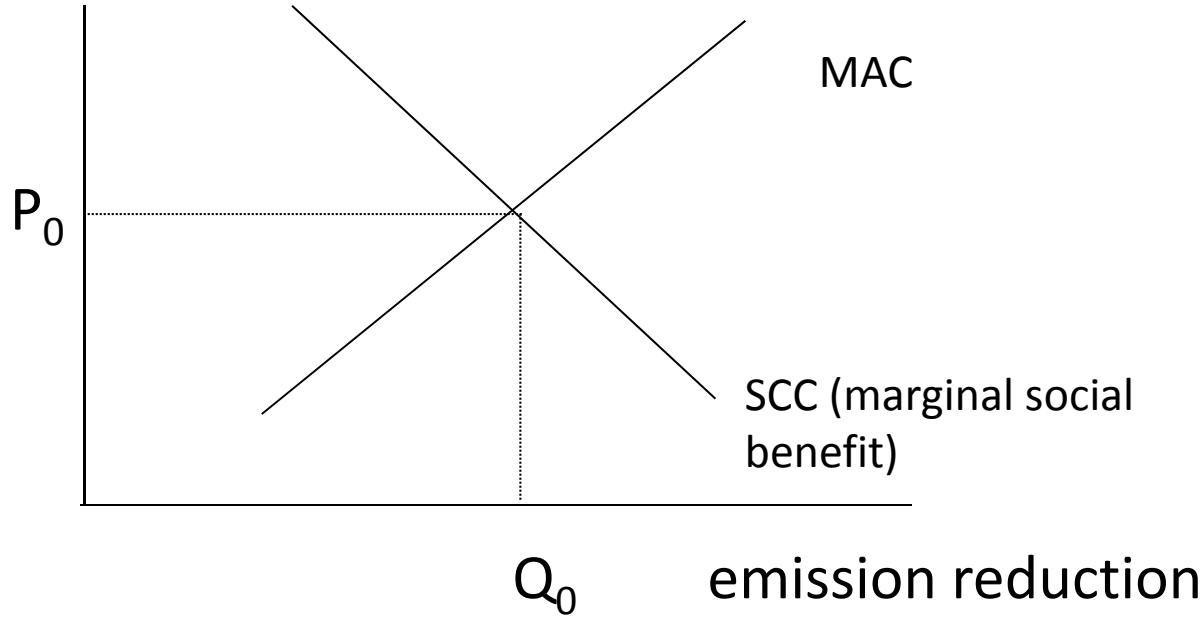
- Uncertainty
- Revenue
- Volatility
- Governance
- Distribution
- Feasibility
- Quantitative “steer”
- Feedback risks
- Transparency

Taxes versus Permits Under Certainty

Efficient abatement: marginal abatement costs (MAC) = Social Cost of Carbon (SCC), with a carbon price applying across all sectors countries

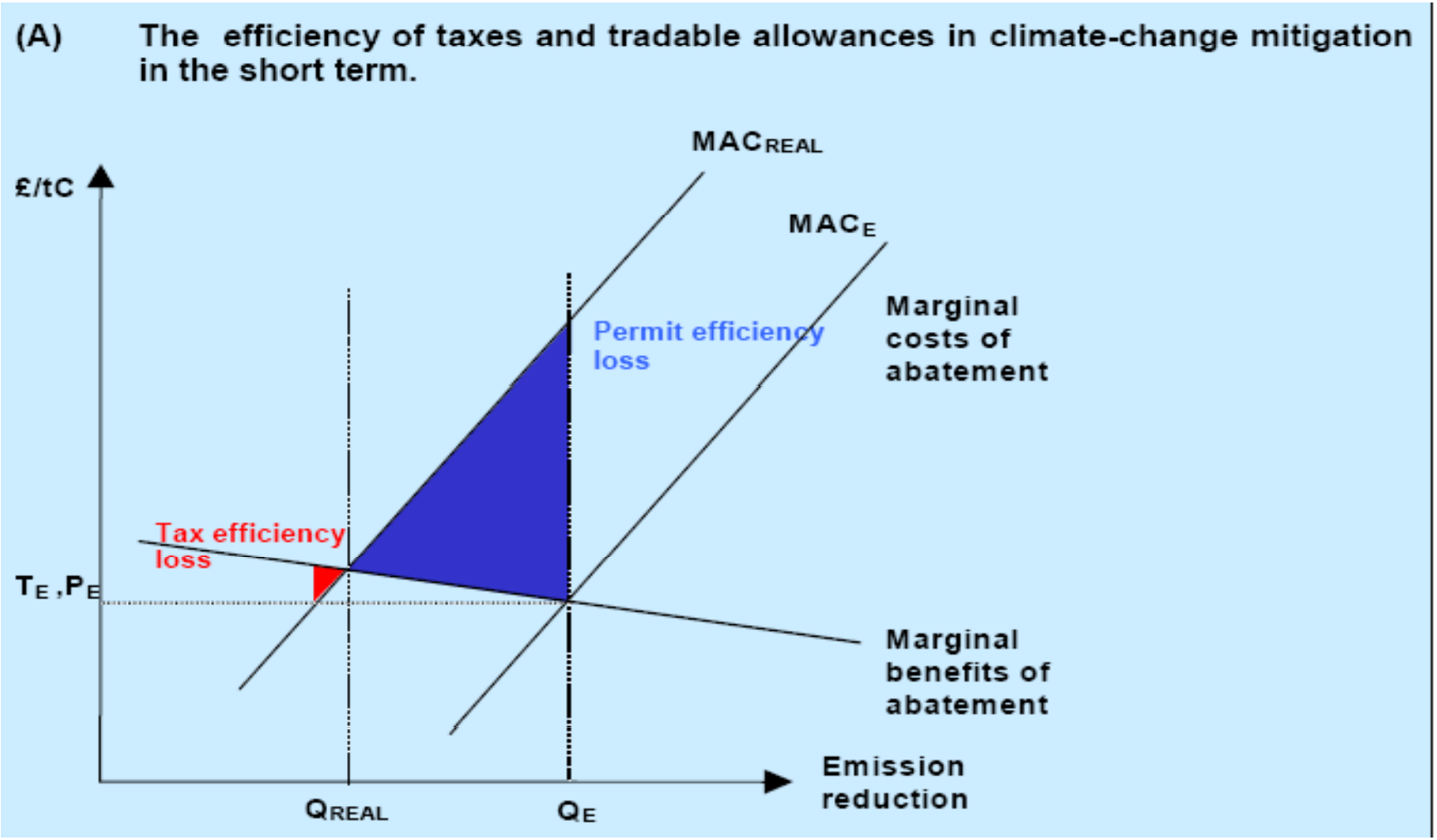
Under certainty, no difference whether a price instrument or a quantity instrument is used

The optimum can be reached either by establishing a price of emissions P_0 or by creating enough tradable emissions permits to enforce abatement Q_0



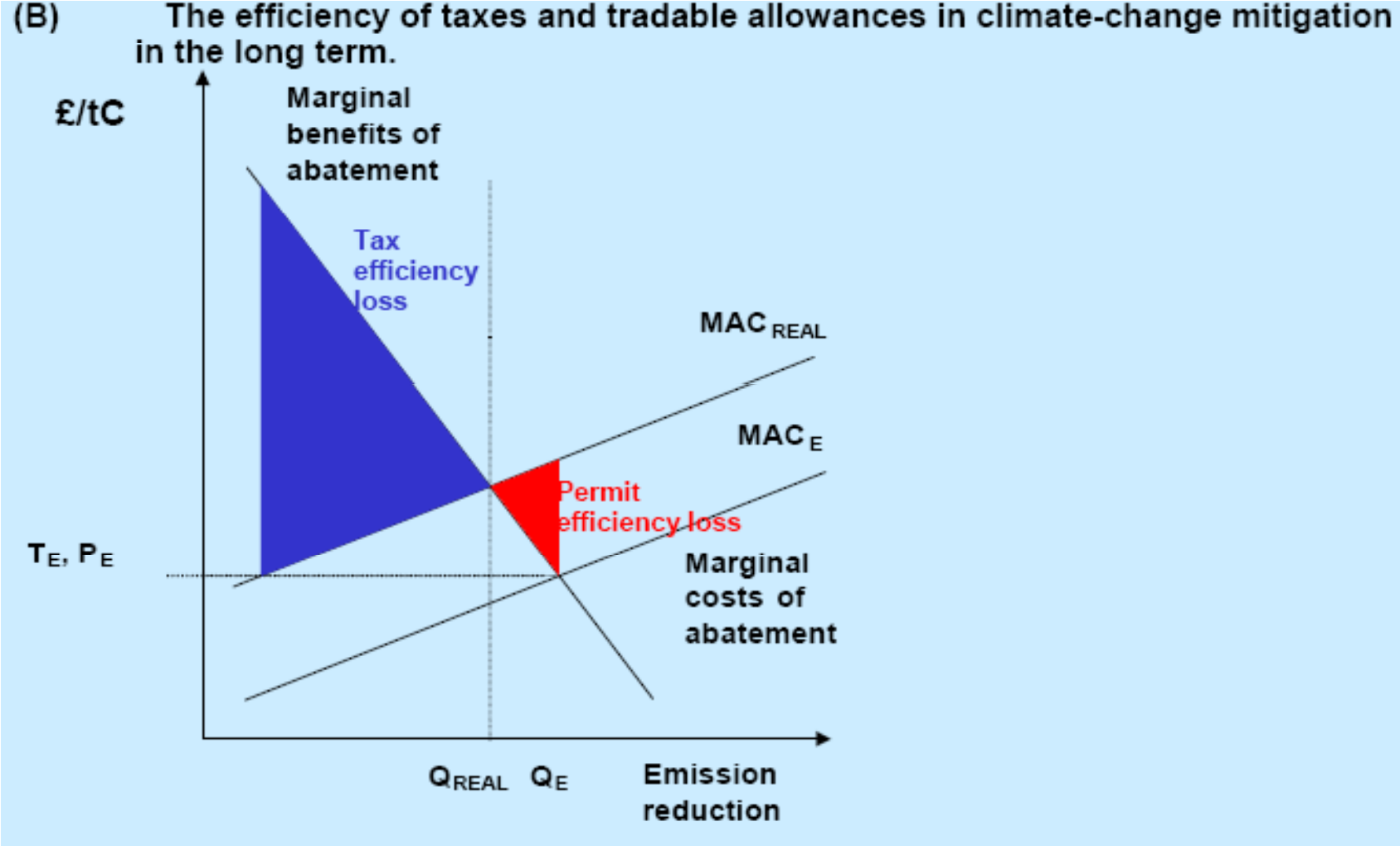
Taxes versus Permits Under Uncertainty

Now it matters. In the diagram, the 'E' subscripts refer to the predicted positions of the two curves. But now we allow uncertainty over MAC and illustrate the case where MAC is higher than estimated. The optimum is now Q(REAL). The efficiency cost with permits is much higher than the efficiency cost with taxes



Taxes versus Permits Under Uncertainty (2)

Now the relative slopes of the two curves are changed, so that a quantity-based solution looks preferable. How are we to choose? This analysis, on its own, seems to favour a price-based approach BUT with a system of revising the carbon price over time so as to achieve a relatively inflexible target for emissions on average.



Taxes versus Permits: Revenue

- Permits yield no revenue unless auctioned
- Tax revenue and
  - Neutrality through revenue recycling
  - Taxing “bads” instead of “goods”
- Greater political acceptability of taxes over cap and trade?

Taxes versus Permits: Volatility

- Carbon prices depends on supply/demand of permits, but supply inelastic and demand elastic (e.g. Hotter than expected summer, cooler winter)
- US acid rain cap and trade prices moved on average 17% per month since 1990, ETS by > 20% per month
- Volatility means:
  - Economic costs of price swings (planning, investing)
  - Market liquidity and speculation with cap and trade

Taxes versus Permits: Governance

- Likelihood of exemptions
- Rent-seeking activities
- Catering to special interests
- Are taxes or cap-and-trade more vulnerable to these eventualities?
  - Local political economy
  - Frequency of change in instrument

Taxes versus Permits: Other Factors

- Initial allocation of permits can be designed to meet distributional objectives
- Permits not feasible with many (mobile) emitters
- Quantitative steer – setting caps where risk aversion because of feedback effects
- Tax regime may be more transparent than cap-and-trade arrangements

Subsidies for Abatement and Mitigation

- The political economy of subsidization
- What to subsidize - not everything can be subsidized
- Efficiency considerations, alternative approaches

Regulation for Abatement and Adaptation

- Particular relevance to adaptation and subsidization
- The potential costs of alternative regulatory choices
  - **C** is the (differential) cost of a regulation and **R** is the consequent (differential) reduction in emissions, so **C/R** is the implicit price of carbon which can be compared with the social cost of carbon (see R.K. Eastwood here and elsewhere)

Varying costs of mitigation

(Llewelyn)

Activity	Implicit cost of carbon ($)	Social cost of carbon ($)
Electricity from land-based wind turbines	0.14 (negative)	30
Hydro electricity	Negative	30
Energy-efficient light bulbs	10	30
Draught-proofing insulation for a house	130	30
Reducing automobile emissions	700 – 2,300	30
Solar thermal electricity	500	30
Solar photo-voltaic cells	6,300	30

Some Reconciliation of Tax, Permits and Regulatory Options

- Possible solution in various hybrid schemes: e.g.
  - Emissions tax at the margin for low-cost "easy" clean-up, but with flexibility: varying taxes where abatement costs high or where worries over total emissions
  - Fixed no. of long-term tradable permits with elastic supply of short-term permits, good for one year in case price goes too high
  - Combination of cap-and-trade and tax and regulation

Should we tax or regulate consumption or production?

- There may be an argument that those responsible for consuming products whose production emits CO_2 should bear the cost of emission mitigation
- But if the consumer pays rather than the producer, the net exports of “virtual carbon” may be taxed upon importation, thus inhibiting export opportunities

Taxing virtual carbon in trade flows at $50 per ton (IBRD estimates)

VCt – VCdp – VCm > 0 = net carbon exporter

VCt – VCdp – VCm < 0 = net carbon importer

where VCt = total emissions

VCdp = total domestic emissions

VCm = total imported emissions

Net exporters	Net importers
China, India, Russia,	EU15, USA
South Africa	Japan

Average tariff on virtual carbon imports at $50/tonne (IBRD)

Country	Imports (%)	Import taxes on Exports (%)
Brazil	3.7	3.1
Canada	2.5	2.8
China	2.2	10.5
EU 15	5.0	1.2
India	4.5	7.8
Japan	4.8	1.4
Mexico	3.3	2.1
Russia	2.6	11.7
United States	3.0	3.0
South Africa	2.9	10.1