



# **‘Tax versus trade’: insights from economic theory**

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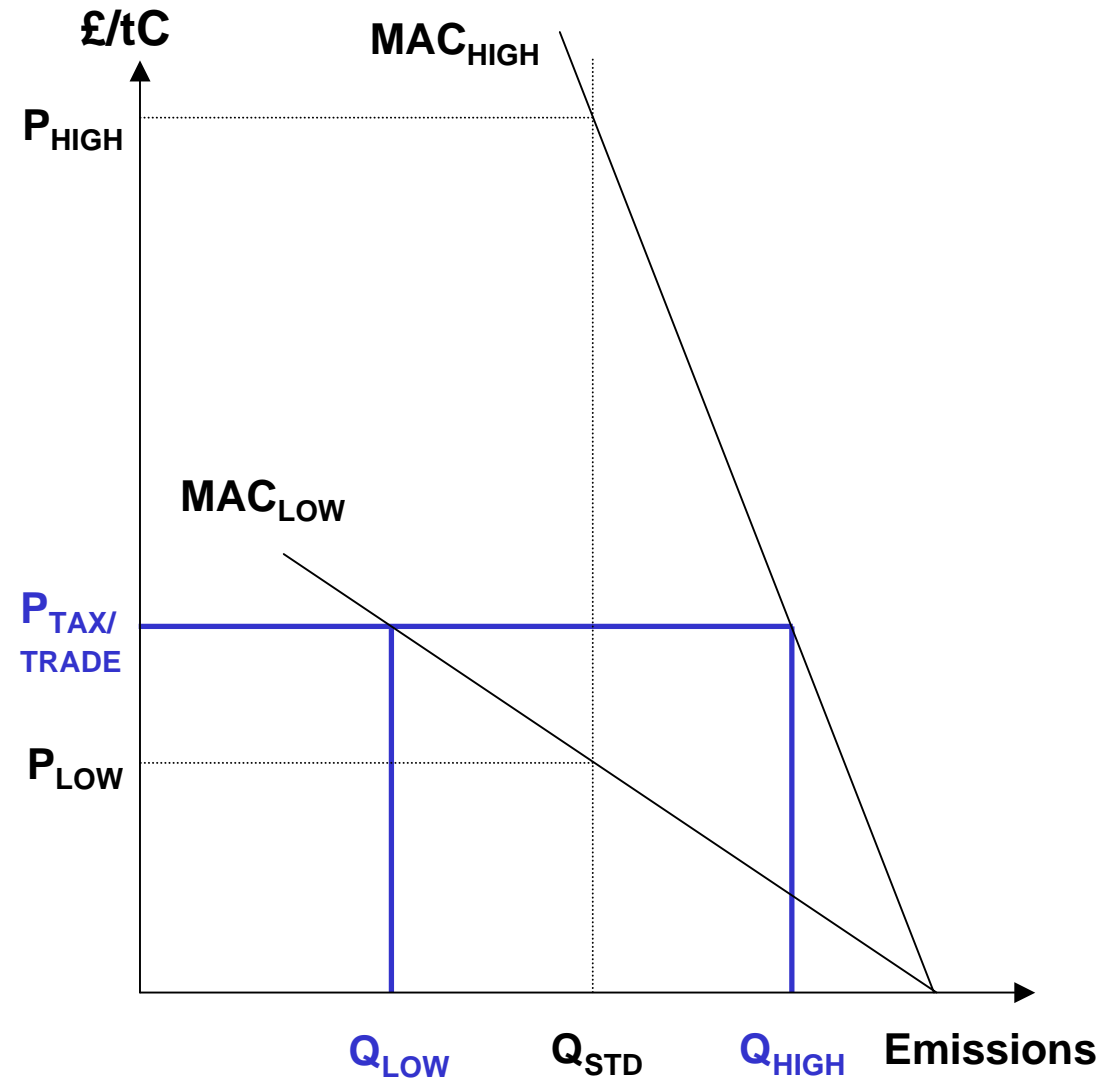
Stern Review and LSE

# Outline criteria

- Cost-effectiveness/efficiency
- Stimulating innovation and adoption of new technologies: the long run
- Will permit markets function well?
- Public finances and equity: the incidence of costs

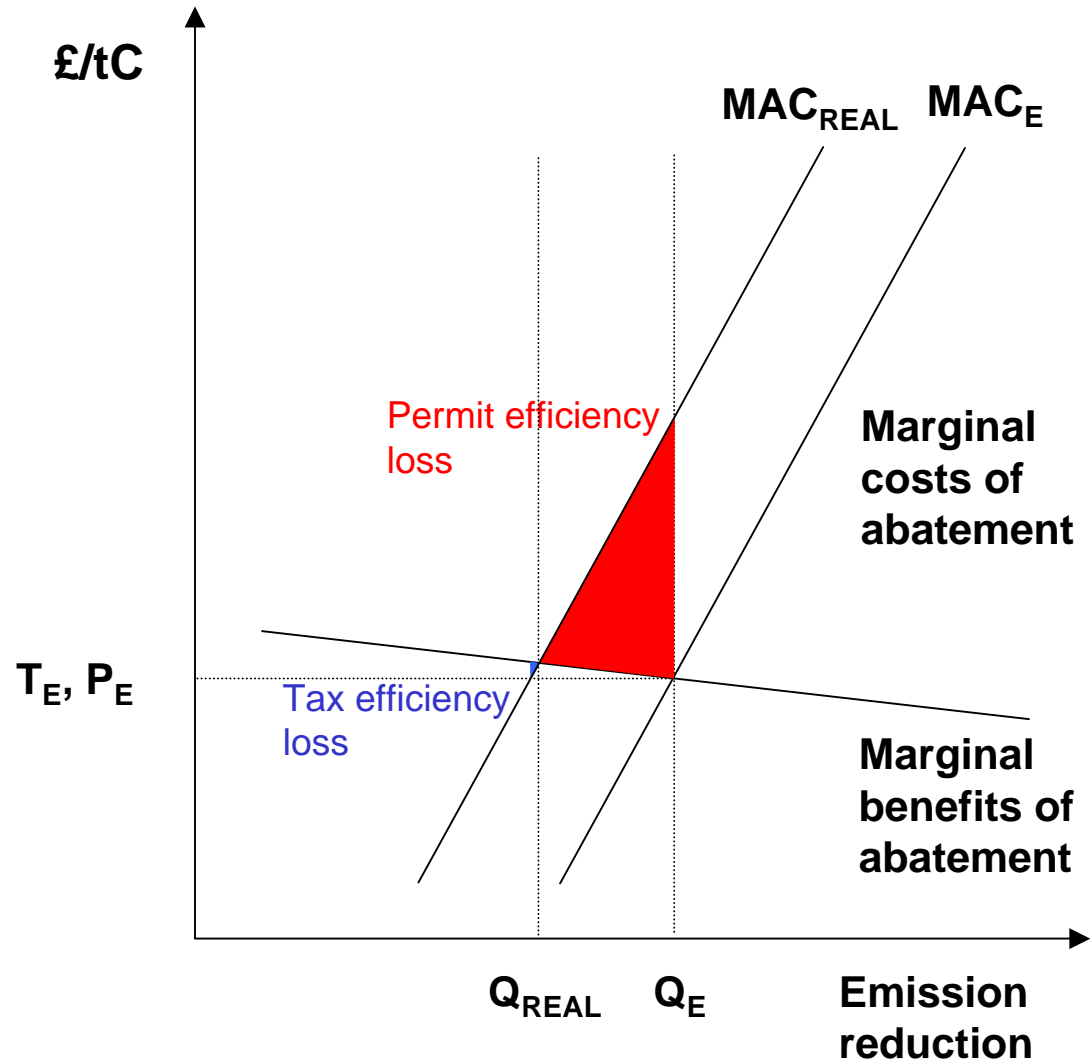
# Basic cost-effectiveness/efficiency

- Textbook theory tells us that taxes and tradable permits are more cost-effective than industry-wide standards where marginal abatement costs differ widely among sources
- Furthermore, taxes and tradable permits will perform equally well



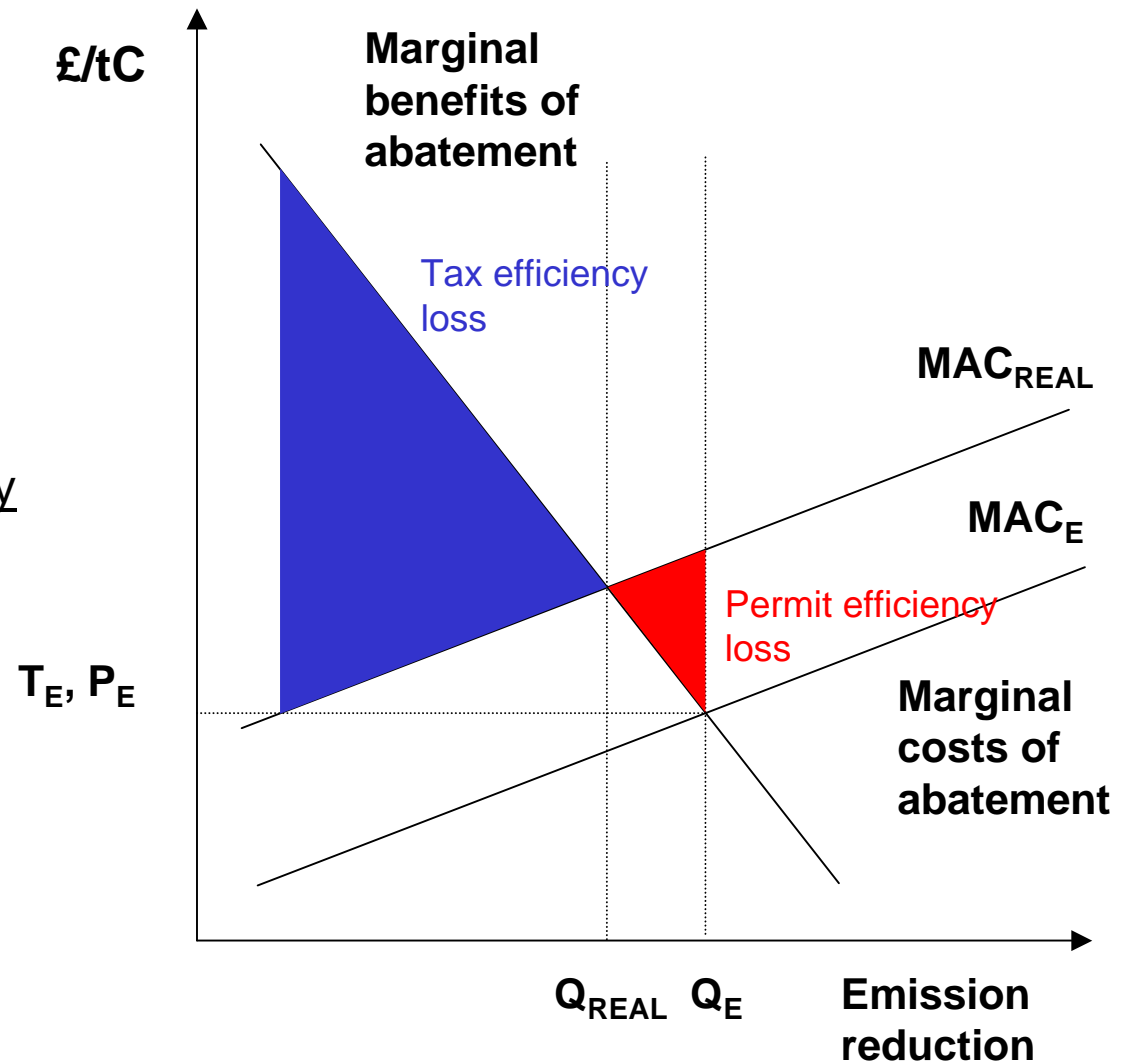
# Cost uncertainty

- After Weitzman (1974)
- Key insight is that taxes control the cost of abatement but leave the quantity of abatement uncertain, whereas tradable permits do precisely the opposite
- In the short run (e.g. over the space of a year), it is usually argued that taxes are more efficient than tradable permits in the face of cost uncertainty



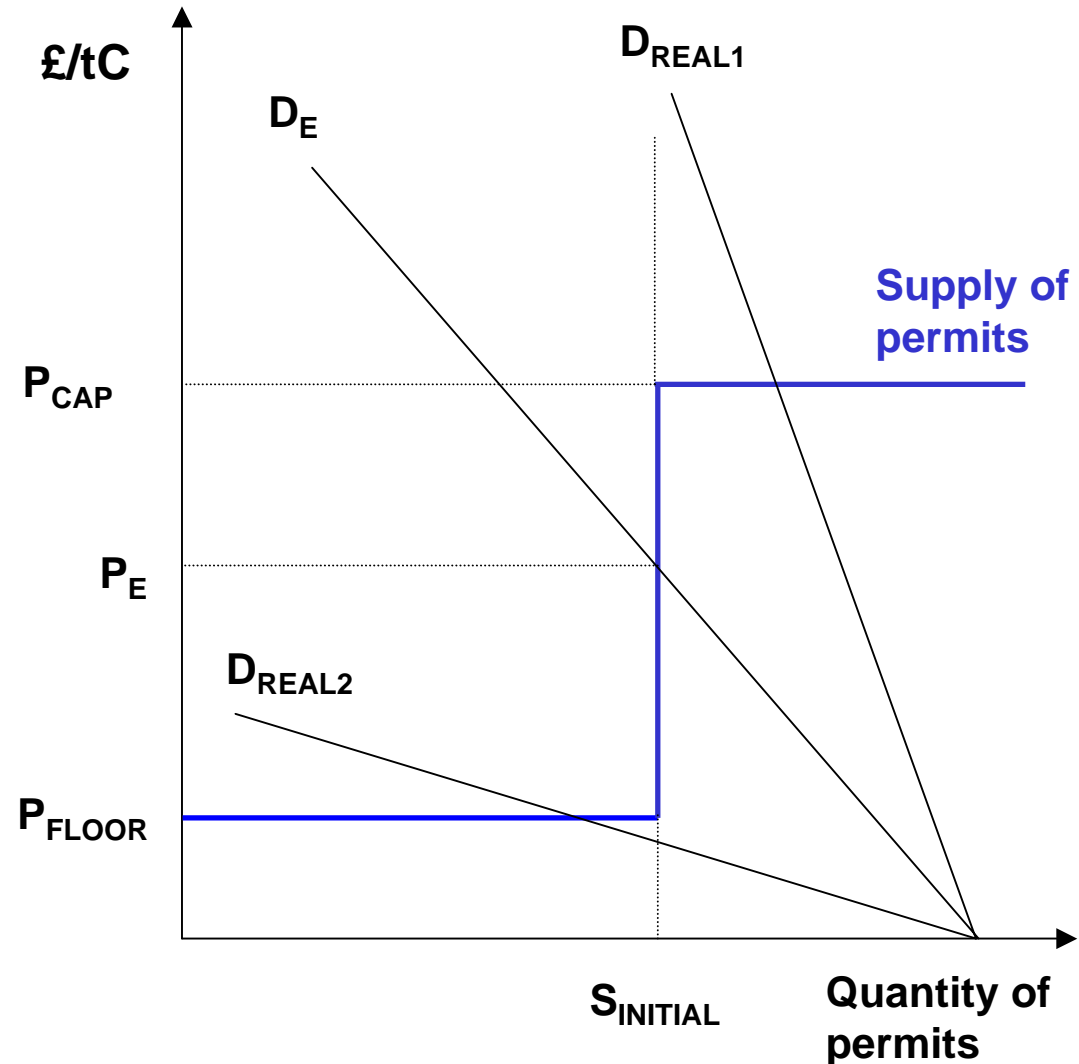
# Cost uncertainty II

- However, in the long run this conclusion could easily be reversed
- There is also the question of what the curves look like under international collective action compared to the choices facing individual regions
- Conclusion is that the quantity of global emissions needs to be controlled in the long run (subject to new information)
- But may be a place for tax or trade (or both) in the short run: choice determined by other issues



# Combining tax and trade

- Key features of both tax and trading schemes can be usefully combined
- Allocate initial fixed quantity of permits
- Guarantee minimum permit price (i.e. floor) and/or maximum price (i.e. cap), e.g. through the regulator buying and selling permits
- Price floor helps pull through new technologies and supports mitigation effort where it is unexpectedly cheap
- Price cap constrains, and provides more certainty about, short-run abatement costs



# Low-carbon technologies

- In the long run (e.g. out to 2050), ability to encourage R&D and deployment of new low-carbon technologies becomes very important
- R&D and deployment is underprovided in the economy as a whole due to spillovers in innovation
- Useful to distinguish between innovation and adoption, because incentives are somewhat different
- No unambiguous answer to tax or trade
- Auctioned permits will usually provide a stronger pull for innovation than free permits

# Will permit markets function well?

- Several possible causes of insufficient trade:
  - Market power
  - Transaction costs of trading
  - Risk-averse firms attempt to minimise their exposure to uncertain costs (n.b. needs to be proven)
  - Unexpected firm behaviour
- But there is *much* room for improvement in system design
  - Efficient and transparent allocation of permits
  - Support liquidity (e.g. the more the merrier)
  - Introduce sophisticated financial instruments (e.g. banking, borrowing, hedging)

# Public finances and equity: the incidence of costs

- Emission taxes and auctioned permits generate revenue, free permits do not
- But predictability of revenue stream is an issue, and auctions may not raise expected revenue
- Several strong arguments for raising revenue
  - Polluter pays principle (in its extended form)
  - ‘Double dividend’
  - Dynamic incentives pointing in the right direction
  - Free permits are regressive (scarcity rents accrue to shareholders) and generally fail to stimulate as much innovation
- Ability to pass through costs is a major determinant of incidence of costs between producers and consumers

# Discussion

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