Climate Change Strategies: What Can Emissions Trading Contribute?

Dr. Alexander Golub

Senior Economist,
Environmental Defense,
Washington, D.C., USA

Climate Policy Puzzle

- Uncertainties:
  - Policy -> Emissions -> Concentration -> Impacts -> Distribution;
  - Policy -> Costs -> Distribution.
- Risks:
  - High economic costs of excessive environmental policy
  - High economic damages if climate policy is not sufficient
  - Selected policy is not enforceable
- Political rhetoric

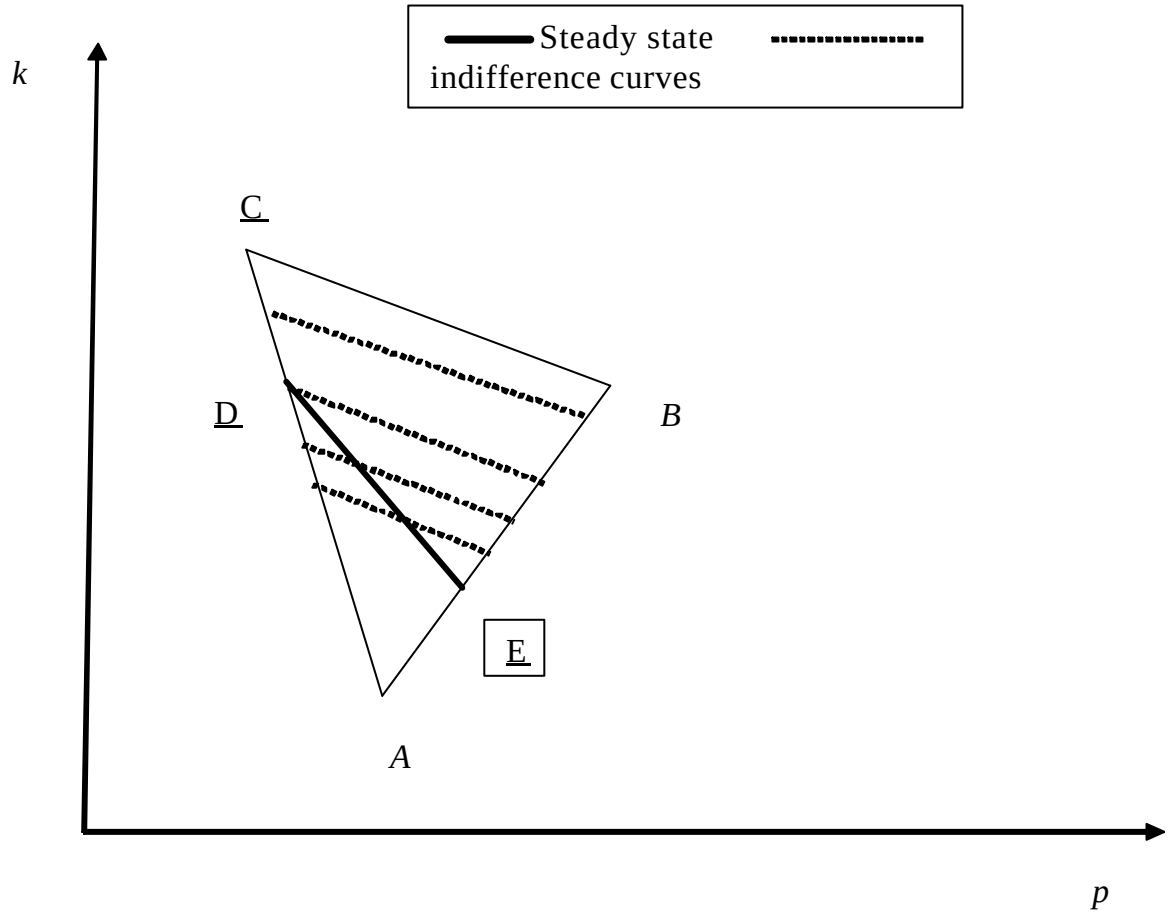
The Challenge Of Environmental Regulation

- Reach environmental goal with the lowest cost
- Build compromise among different groups involved
- Create achievable goals
- Build enforcement mechanisms

Costs of Climate Policy

- Costs
  - Mitigation
  - Adaptation
  - Damage associated with climate change
- Long-term costs and innovations
  - Technological innovations: way to cut mitigation costs
- Climate policy
  - Prevention of long-term damage
  - Controlling of short-term costs
  - Induce technological innovations
- Induced technological innovation is the only way to build "affordable" climate policy

Climate Policy and Technological Leapfrogging



Emerging Climate Policy

- UN Framework Convention:
  - General goal to avoid dangerous interference
- Kyoto protocol to UNFCCC:
  - Cap and trade for developed countries
- EU regulation:
  - Cap and trade (about 50% of emission)
- US:
  - Intensity target
- Canada:
  - Cost cap
- Japan:
  - Symbolic tax

In Case Of Uncertainties One Instrument Is Preferred

- Martin Weitzman (1974) in Prices vs. Quantities:
  - Slope is important:
    - Tax is preferable If MC is steep and MD is shallow, in the opposite case cap on emission is preferable
- William Pizer (2002):
  - Investigated P vs. Q with respect to stock pollutants (i.e. GHG):
    - As a rule MD is flat for stock pollutants, then carbon tax is more efficient then emission cap
    - Hybrid policy or cost cap
- In the non risk-neutral case cost cap may have distortion effect on R&D activity

Selection of Instruments

- Cap and trade:
  - Reduces climate risks by creating real limit on absolute emissions
- Intensity target:
  - Reduces the risks of high economic costs if the economy exhibits rapid economic growth
- Emission tax or cost cap:
  - Hedges high mitigation costs

Cap on Emissions

- Quantifiable environmental results
- The most cost-efficient way to meet environmental target
- No evidence of the negative impacts on economic growth
- Induces technological innovations and allowes partial conversion to a new technology
- Precedent for emission target negotiation:
  - Tightening emission target for developed countries
  - “Relax” emissions budget for developing nations

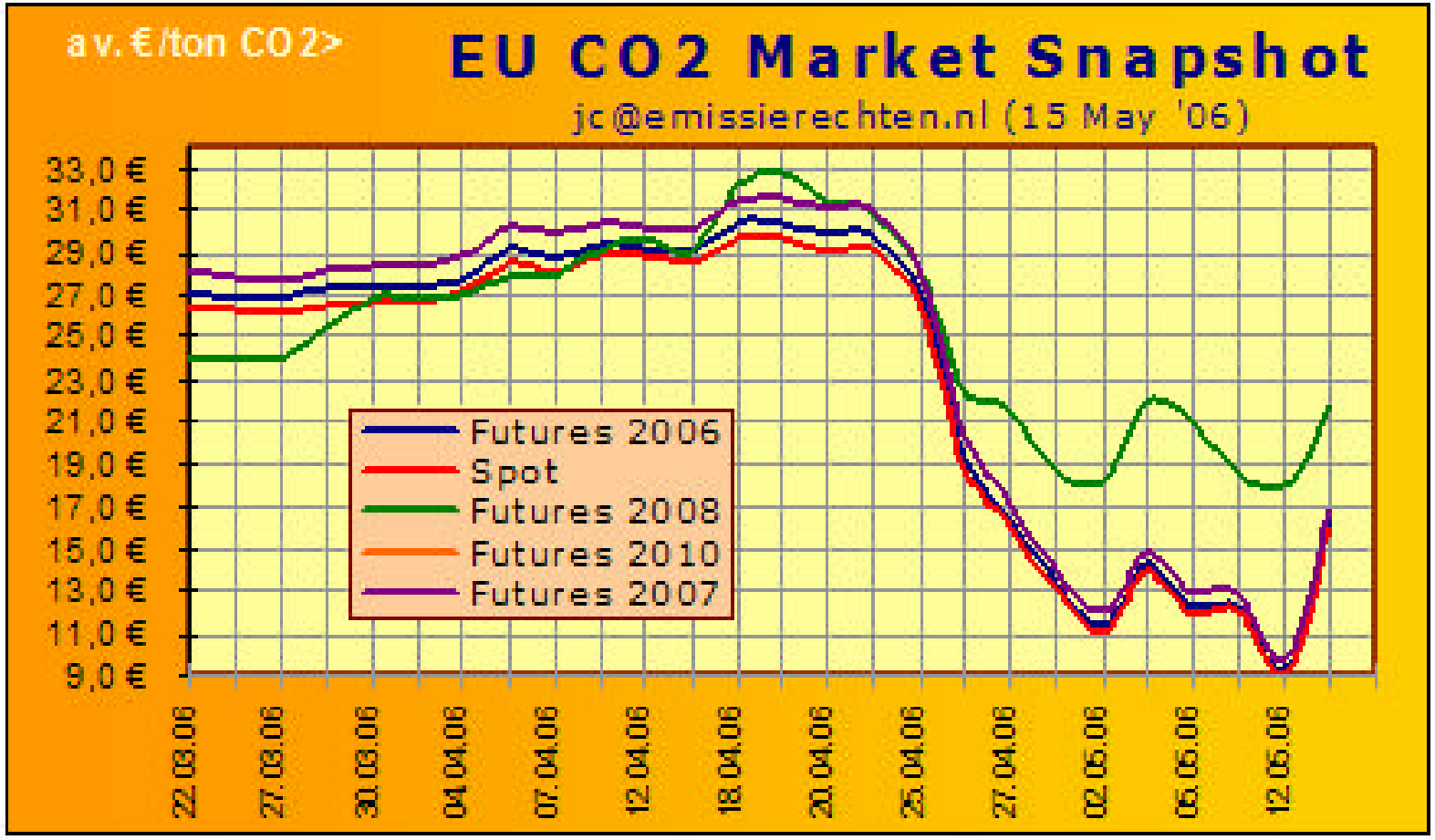
Flip Side Of Price Instruments

- When abatement costs are uncertain – price instruments may discourage innovations
- If firms are risk averse, they may prefer to pay tax instead of investing in R&D
  - R&D is only relevant in anticipation of decreased abatement costs of adopting a new technology or significantly modifying an existing one
- More R&D would translate into more innovation and accumulation of knowledge that, in turn, may lead to increasing return to scale and reduction of long-term abatement costs

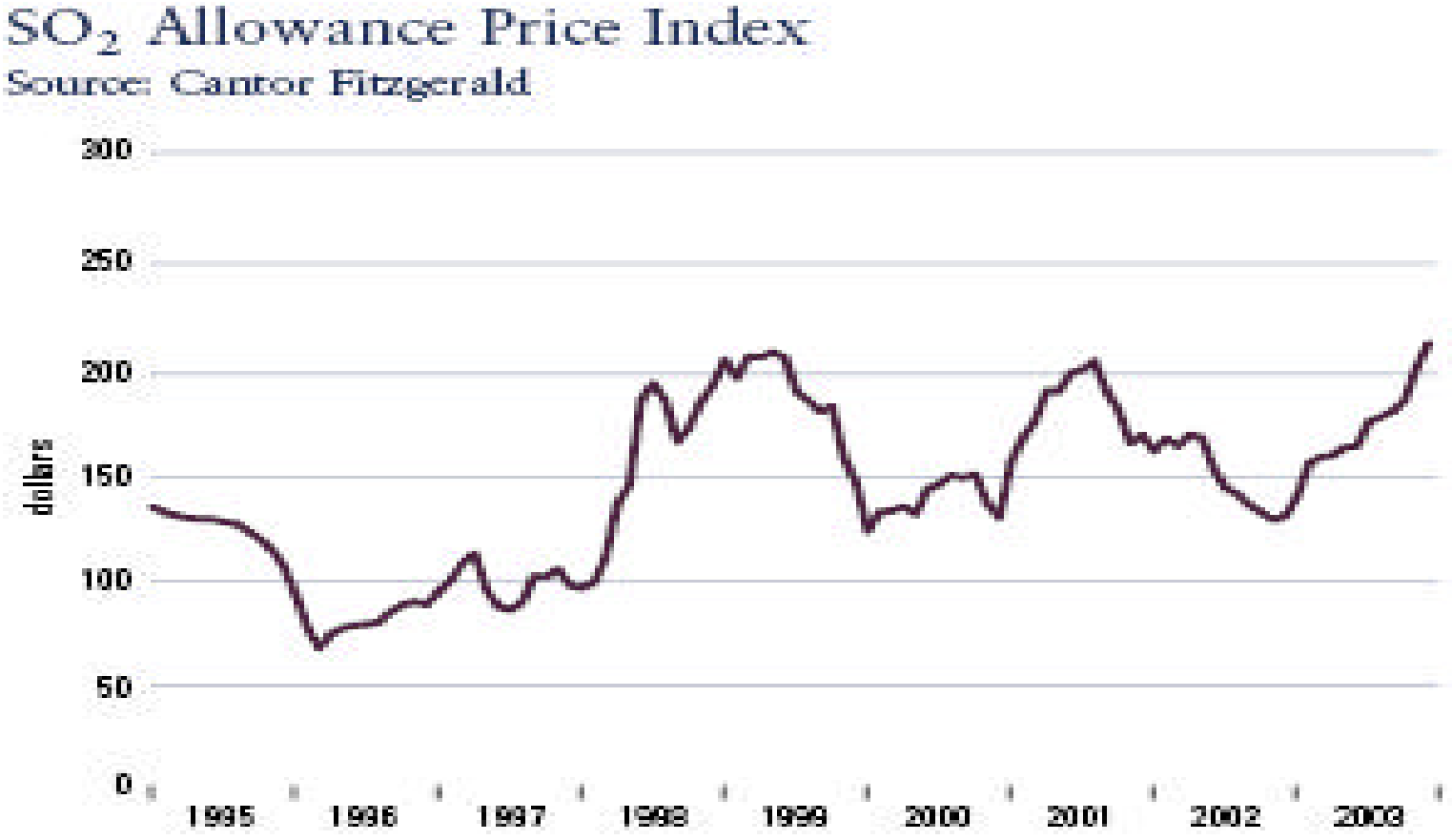
Emission Cap and Price Elasticity

- Allowances Prices Indicate an Adjustment To The New Regulation Under Cap And Trade
- Short-term price elasticity is lower than long-term elasticity
- Even energy-efficient European economy had limited potential of low-cost and no-regret options
- Under emission cap allowances price decline does not erode the environmental target

Drifting To Production Possibility Frontier



Exploring Possibility for Cost Reduction



SO_2 Emissions And Economic Growth

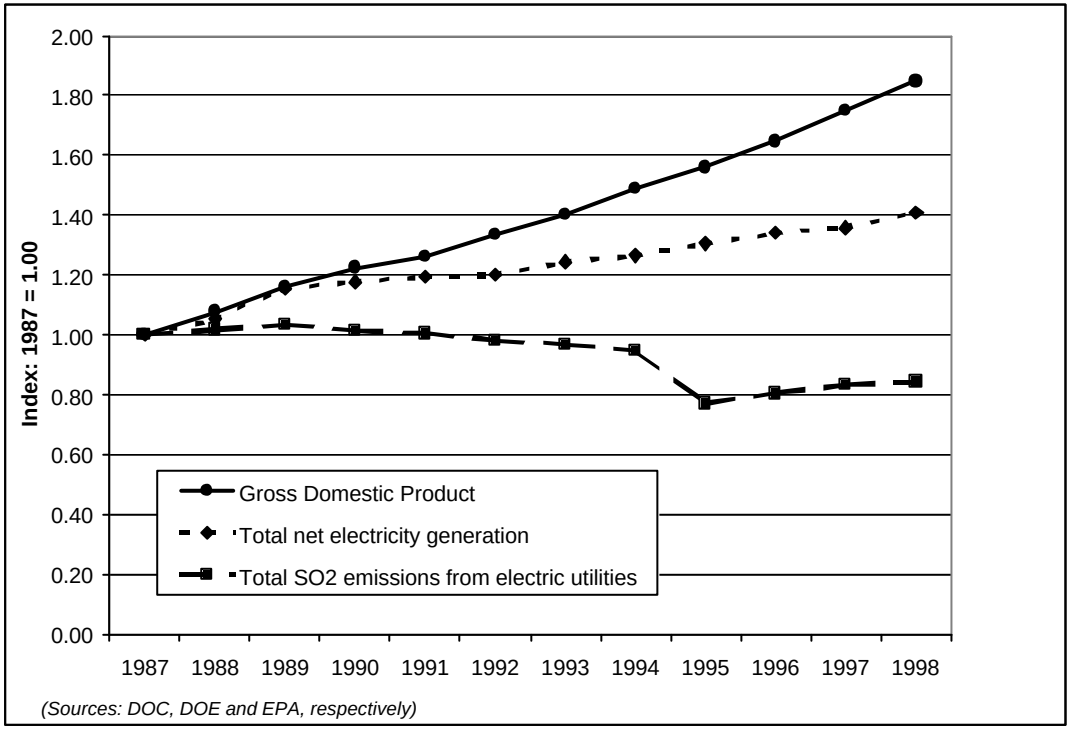


Figure A12. United Kingdom, Sulfur emissions (1850-1999) and Real GDP per capita (1870-2001).