Carbon Taxes Vs Tradable Permits: Efficiency and equity effects for a small open economy

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Reduce Greenhouse Gas Emissions

• A global externality market failure
• Policy intervention options
  – Carbon tax
  – Tradable permit
    • Auction permits
    • Gift permits
  – Other
• Economic analysis and comparison
  – Effects on market outcomes
  – Efficiency
  – Distribution and equity
• Focus on small open economy as an early mover
Policy Context and Challenges

- Global pollution
- Long time lags
- Uncertainty and change
- Absence of a global government
Single Product, eg electricity, meat

- Market solution

![Diagram showing a market solution with D = MPB (=MSB) and S = MPC]
Single Product, eg electricity, meat

- Society solution with pollution cost

MSC = MPC + MEC
S = MPC
D = MPB (=MSB)

Product price

Q*

Qbau

Quantity of electricity, transport, meat, etc
Pollution Product, and Aggregate Consumer Products

Price or cost per unit emission

T*

MAC

h

i

j

k

MEC

Q*

Qbau

Quantity of emissions
Tax Vs Tradable Permit: Perfect Knowledge

• Tax at $T^*$
  – Extra production cost
  – Pollution falls to $Q^*$
• Tradable permit for pollution quota at $Q^*$
  – Extra production cost
  – Market price $T^*$
• (Absolute and relative) Consumer prices and production costs rise for the pollution intensive
• Efficiency gain of area ‘k’
Tax Vs Tradable Permit: Perfect Knowledge

• Distributional effects (of effectively an additional and new indirect tax)
  – Government gains area ‘h + i’
  – Distribution between producers and consumers depends on relative demand and supply elasticities
    • Supply perfectly elastic: all passed on to consumer
    • Producer price taker: all passed back to fixed resource owners
  – Inter-country distribution favours free riding
Tax Vs Tradable Permit: Imperfect Knowledge and Shifts of MAC and MEC Functions

• Imperfect knowledge of MAC and MEC
  – Decision errors
  – Favour price if MAC less elastic than MEC
  – Unclear story in long run for greenhouse case
• (Short term and cyclical) Shifts over time of MAC
  – Tax: stable price, variable quantity
  – Tradable permit: stable quantity, variable price
  – Decision advantages for stable price
New Zealand Example: Base and Economic Incidence

- **Petroleum products**
  - Destination base
  - 100% pass through to buyers
- **Electricity**
  - Non-traded product
  - < 100% pass through
- **Agriculture**
  - Production base
  - Negligible pass forward if early mover
- **Users of petroleum and electricity inputs**
  - Production base
  - Close to 100% pass forward for non-traded
  - Close to 0% pass forward for non-traded if early mover
Global Policy Challenge

• Need a cooperative global agreement
• Tax Vs Tradable Permit
  – In principle, harmonised tax and open trade in permits would have similar desired effects
  – In reaching a political agreement, tax option
    • Recycles most revenue within each country and minimises inter-country redistribution
    • Better isolates administrative failures to individual country
  – Current policy impetus on permits
Assisting the Trade Exposed Energy Intensive Industries

- Early mover with production base
  - Increase imports, lose exports, currency depreciation, but
    - Change country comparative advantage
    - Carbon leakage
    - Unnecessary industry restructuring and reversal
- Destination base corrects these problems. Tax seems more amenable
- All countries sign global agreement
  - Back to non-traded model, with no case for assistance
Assisting the Trade Exposed Energy Intensive Industries

- Australian and New Zealand proposals
  - Exempt imports, import substitutes and exports
  - With undesired effects of:
    - Narrows effective base for reduction of emissions
    - Distorts decisions between the traded and non-traded sectors for no market failure reason
Conclusions: Tax Vs Tradable Permits to Reduce Greenhouse

• Similar effects:
  – Raise costs to tap broad set of options to change consumption, production and R&D to reduce pollution
  – Base points of application, and administrative challenges

• Some advantages for tax option:
  – Price stability, at cost of quantity volatility, favours decision making
  – More natural consumption base for assisting TEEI when early mover
  – May help global agreement making

• Some advantages for tradable permit option:
  – Has the political initiative