Earmarking Environmental Taxes

The U.S. Experience

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The Promise of Pigouvian Taxes

- Tax = marginal social cost of emissions can → efficient level of pollution
The Problem with Pigouvian Taxes

- Polluters often >>> concentrated and better organized than victims ("entrepreneurial politics")

<table>
<thead>
<tr>
<th>Wilson-Hayes Matrix</th>
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<tbody>
<tr>
<td>Costs = Diffuse</td>
</tr>
<tr>
<td>Benefits = Diffuse</td>
</tr>
<tr>
<td>Benefits = Concentrated</td>
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</table>
Public Choice with a Cognitive Twist

- Costs of pollution taxes often >>> salient than benefits

Modified Wilson-Hayes Matrix

<table>
<thead>
<tr>
<th></th>
<th>Costs = Less Salient</th>
<th>Costs = Highly Salient</th>
</tr>
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<tbody>
<tr>
<td>Benefits = Less Salient</td>
<td>Unnoticed</td>
<td>Unpopular (least likely)</td>
</tr>
<tr>
<td>Benefits = Highly Salient</td>
<td>Crowd-Pleasing (most likely)</td>
<td>Competitive</td>
</tr>
</tbody>
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Crowd-Pleasing

(least likely)

Competitive
Earmarking as a Solution

- Earmarking = strategy for moving pollution taxes from top right quadrant to bottom right quadrant

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<th>Benefits = Diffuse/Less Salient</th>
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<tr>
<td>Income Tax → General Expenditures</td>
<td></td>
<td>Classic Pollution Tax</td>
</tr>
<tr>
<td>Earmarked Income Tax</td>
<td></td>
<td>Earmarked Pollution Tax</td>
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Revenue Recycling

- Environmental taxes often = earmarked for the benefit of the same group that pays the tax

- **Recycling Options**
  - Lump sum (e.g., fuel tax + fixed payment to all motor vehicle owners)
  - Output-based (e.g., fuel tax + subsidy based on vehicle miles traveled)
  - Public works (e.g., fuel tax + revenues earmarked for highway construction/repair)
Examples from U.S. Experience

- Federal motor fuel tax
  $$$ → Highway Trust Fund

- Federal tax on jet fuel, airline tickets, takeoffs, landings
  $$$ → Airport and Airway Trust Fund

- Federal tax on petroleum production and imports
  $$$ → Oil Spill Liability Trust Fund
Earmarks Affect Environmental Impacts

- Can enhance positive environmental impact of pollution tax
  - e.g.: fuel tax → mass transit spending

- Can reduce positive environmental impact of pollution tax
  - e.g.: fuel tax → offset highway tolls

- Can reverse environmental impact of pollution tax
  - e.g.: petroleum tax → oil spill insurance
Analyzing the Package Deal

- Should we consider environmental taxes and earmarks separately or as a unit?
  - “general revenue replacement hypothesis” → separate analysis
  - “political package deal hypothesis” → holistic analysis

- Neither hypothesis = possible to (dis)prove
  - Perhaps earmarks = accounting trick
  - But: Somewhat difficult to believe that lawmakers are pulling a “fast one” on sophisticated interest groups
Case Study #1

Federal Motor Fuels Tax

- 1932: Excise tax on gasoline enacted (1¢/gallon)
- 1956: Interstate Highway System est.; gasoline and diesel tax receipts → Highway Trust Fund
- 1983: 1¢/gallon (out of tax then of 9¢/gallon) → mass transit account
- 1986: 0.1¢/gallon → Leaking Underground Storage Tank (LUST) Fund
- Since 1997: 18.4¢/gallon tax on gasoline (24.4¢/gallon on diesel)
  - 15.44¢ → highway account (19.44¢ for diesel)
  - 2.86¢ → mass transit account
  - 0.10¢ → LUST Fund
Positive Aspects of the Gas Tax

- Collected “at the rack” (where fuel is transferred from refinery to wholesaler)
  - ~140 operable refineries in the United States vs. >250 million motor vehicles
  - upstream collection →
    - <<< administrative costs and <<< evasion

- NOTE: States impose gas taxes as well (average rate ≈ 20¢/gallon); administration at the state level >>> complicated (with some evidence of evasion)
Gas Tax and Its Discontents

- Too low
  - Parry & Small (2005): Optimal gas tax = $1.01/gallon

- Based on volume rather than energy content
  - One gallon of gasoline taxed the same as one gallon of E85
  - E85 → >>> gallons burned/mile but <<< CO₂/mile
  - Drivers of E85 vehicles pay ~50% more in gas taxes/unit of CO₂ than drivers of gasoline-fueled vehicles
Winners and Losers

- Hummers “cross-subsidize” Prius drivers
  - similar benefit/mile (better roads; reduced tolls)
  - BUT: Prius drivers pay <<<< in taxes than Hummer drivers
Mass Transit Account

- ≈ 16% of gasoline revenues (12% of diesel)
- Earmarking for mass transit enhances the positive environmental impact of the fuel tax
- Makes driving less attractive relative to mass transit ridership
Case Study #2

Federal Aviation Taxes

- 4.3¢/gallon on kerosene fuel for commercial aviation (21.8¢ for noncommercial fuel)
- 7.5% tax on price of domestic tickets + frequent flyer awards
- $4/passenger tax on each takeoff and landing
- $17.70/passenger tax on international arrivals and departures

→ Airport and Airway Trust Fund
How To Make Aviation Taxes First-Class

- Raise the jet fuel tax
  - Existing ticket price tax only loosely correlated with environmental externalities
  - Existing jet fuel tax <<<< environmental externality
    - OMB (2015) estimate: Social cost of CO₂ emissions ~ 34¢/gallon of jet fuel

- Can be revenue-neutral for airline industry if >>>> jet fuel tax → <<< ticket price tax
  → incentive for airlines to achieve >>>> fuel efficiency
Winners and Losers from Aviation Tax Reform

- Spirit Airlines ~40% > fuel efficient than US Airways
  - Spirit: 63 revenue passenger miles (O→D)/gallon
  - US Air: 45 revenue passenger miles (O→D)/gallon

- Reform would reward airlines for more modern aircraft, more direct routes, fewer half-empty flights
Case Study #3

Federal Petroleum Tax

- 8¢/barrel on petroleum produced in and imported into the United States (→ 9¢ in 2017)
- Oil Spill Liability Trust Fund (est. 1986)
  - firms = insured against spill-related costs above liability limit
    - $6.6 million for 3000-ton tank vessel
    - $634 million for deepwater port
- exceptions
  - gross negligence, willful misconduct, violation of federal regulations
- state law claims
A CAUTIONARY TALE

- <<<<<< marginal social cost of emissions
  - Tax = 8¢/barrel
  - Social cost of emissions ≈$15.48/barrel considering CO₂ only (OMB 2015)

- = insurance w/out risk-adjusted premiums
  → safer firms cross-subsidize riskier firms

- Better off w/ no petroleum tax and an insurance mandate for firms that produce and import petroleum?
What the U.S. Experience Teaches

- Earmarking can carry environmental taxes over political obstacles that generally lie in the path of Pigouvian taxes

- Earmarking can enhance, reduce, or reverse the positive environmental effects of pollution taxes

- Comprehensive analysis of environmental taxes requires consideration of both elements of the earmark package