Growing Conflicts of Interest

Roberton C. Williams III

University of Maryland, University of Texas,
Resources For the Future, and NBER

Fiscal Federalism Project Pre-Conference

July 22, 2009

-Environmental federalism literature shows that in federal system, the level of government that regulates an externality should match the scope of the externality (e.g., local governments regulate local externalities, national government regulates national externalities)

    -Parallel to fiscal federalism results for public good provision

-However, we observe cases in which the federal government forces local governments to regulate local pollution (e.g., ground-level ozone "non-attainment" areas).

-Even harder to reconcile with literature are cases in which the federal government has limited local governments' regulation of national-level pollution (e.g., California's attempt to limit motor vehicle CO_2 emissions)

Hypothesis/Potential Explanation

-Fiscal externalities: if local policy reduces federal tax revenues or increases
federal spending, part of the cost of the policy is borne by the federal
government.

-If national government implements optimal pollution tax, local government has
incentive to further restrict pollution

A Simple Model

-Pollution emissions from local jurisdiction i are q_i, total emissions $Q = \sum_i q_i$

-Damage from pollution in location i given by $D_i(q_i, Q)$

-Cost in i of achieving pollution level q_i given by $C_i(\mathbf{q})$

-Pollution regulation:
    -Command-and-control: government (local or national) chooses q_i
    -Pollution tax: τ_i local, T_i national
        -Fraction r_i of marginal dollar of federal tax revenue returned to i, $\sum_i r_i = 1$

-National government objective: $\min \sum_i \left[D_i + C_i \right]$

-Local government objective: $\min D_i + C_i + T_i q_i - r_i \sum_j T_j q_j$

-Local taxes net out of objective
-National taxes net out for national government, but not for local governments

Command-and-Control by National Government

-National government chooses q_i such that $\dfrac{\partial C_i}{\partial q_i} = \dfrac{\partial D_i}{\partial q_i} + \sum_j \dfrac{\partial D_j}{\partial Q}$

-Local government chooses q_i such that $\dfrac{\partial C_i}{\partial q_i} = \dfrac{\partial D_i}{\partial q_i} + \dfrac{\partial D_i}{\partial Q}$

-If $\displaystyle\sum_{j \neq i} \dfrac{\partial D_j}{\partial Q} > 0$ then national government will choose lower q_i than local government

-Same result holds if local government uses pollution tax

-Do other 49 states get a net benefit from climate change?

Pollution Tax by National Government

-National government still wants $\dfrac{\partial C_i}{\partial q_i} = \dfrac{\partial D_i}{\partial q_i} + \sum_j \dfrac{\partial D_j}{\partial Q}$

-Local government now wants $\dfrac{\partial C_i}{\partial q_i} = \dfrac{\partial D_i}{\partial q_i} + \dfrac{\partial D_i}{\partial Q} + (1 - r_i) T_i$

-Suppose that national government sets $T_i = \dfrac{\partial D_i}{\partial q_i} + \sum_j \dfrac{\partial D_j}{\partial Q}$ (optimal if $\tau_i = 0$)

 -Local government will further restrict pollution if $\dfrac{\partial D_i}{\partial q_i} + \dfrac{\partial D_i}{\partial Q} > r_i T_i$

 -With tax, marginal cost to local firms of reducing pollution is zero
 -Instead cost shows up as reduced pollution revenue for national government
 -Incentive to tighten if local damage exceeds return from marginal federal dollar
 -Again, result holds whether local government uses pollution standard or tax

-This is a difference between pollution standards and taxes not previously recognized in
   literature

Pollution Tax by National Government (cont.)

-Does this mean national government should use standard instead of tax?

-Suppose national government recognizes that local government has this incentive to further tighten pollution regulation, and sets tax accordingly

-This implies $T_i = \sum_{j \neq i} \dfrac{\partial D_j}{\partial Q} \Big/ (1 - r_i)$

    -Satisfied by $T = \sum_j \dfrac{\partial D_j}{\partial Q}$ and $r_i = \dfrac{\partial D_i}{\partial Q} \Big/ \sum_j \dfrac{\partial D_j}{\partial Q}$

    -In this case, national regulation covers national externality, local regulation covers local externality

Other Hypotheses/Potential Explanations

-Policy by one local government could induce similar effects elsewhere.

    -Standard-setting: large state imposes environmental requirements on a product with large increasing returns to scale ==> mix of products available in market shifts in ways that reduce pollution elsewhere (or induce other local governments to copy policy)

-"Warm glow": local area cares not just about total amount of national-level pollution, but also about its contribution to that total

-Political economy: government (federal or local) isn't maximizing citizens' welfare