Environmental Policy Mixes: Motivations, Evidence & Effectiveness

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Environmental Policy Mixes

- Use of multiple policy instruments to target single environmental objective
- Few cases in which single policy measure actually applied: mixes as rule not the exception
- Often introduced consecutively with little thought given to potential interactions
- OECD projects:
  - to assess evidence of mixes; analysis of interactions; and, means of co-ordination
  - environmental effectiveness of application of multiple environmental policy instruments

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Evidence of Mixes: Regional and Local Air Pollution

- OECD Project – case studies on use of policy mixes in United States, France, Sweden, Slovak Republic, Australia
- Frequent use of following combinations:
  - tradable permits with direct regulation
  - direct regulation with investment subsidies
  - direct regulation with research & development
  - taxes with subsidies

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Motivations for Use of Mixes With Respect to Regional and Local Air Pollution

- Spatial or temporal heterogeneity of environmental impacts
- Reducing cost uncertainty
- Encouraging higher levels of compliance
- Technological market barriers or failures
- Extending regulatory reach
- Addressing competitiveness and other concerns

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Spatial or Temporal Heterogeneity

• Difficult to achieve given environmental target at minimum cost with a single policy instrument

• Often the application of a 'flexible' policy instrument (i.e. emissions tax or tradable permit) alongside a 'prescriptive' instrument (i.e. technology standards)

• Efficiency gains with minimum protection against 'hotspots' or 'spikes'

•Potential disadvantages – delicate balancing act requires a great deal of information and good co-ordination

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Reducing Cost Uncertainty

• Policies always introduced against a background of (very) imperfect information

• First-best instrument under perfect information may not be best under imperfect information

• Combination of quantity (tradable permit or performance standard) and price (tax/subsidy) instrument

•Potential disadvantages – difficult to protect against uncertainty in both directions

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Encouraging Full Compliance

• Full compliance with environmental regulations as exception and not the rule

• There may be 'limits' (public resources or notions of fairness) which prevent levels of enforcement and imposition of penalties which result in full compliance

• In such cases – provision of financial support (subsidies) sometimes provided to meet given environmental regulations

•Potential disadvantages: adverse selection and moral hazard

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Technology Market Barriers and Failures

• Perception that 'standard' environmental policy instruments do not 'call forth' innovation in a sufficiently strong or timely manner

• Use of policies to internalise environmental externalities alongside complementary measures (support for R&D, public-private collaboration, etc…) to overcome barriers to environmentally-beneficial innovation

• Potential disadvantages: Significant information requirements - > misdirection of innovation

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Addressing Competitiveness and Other Concerns

• Concerns that the application of the 'ideal' policy instrument will have unacceptable repercussions

• Competitiveness and distributional concerns often significant barriers to policy implementation

• Use of a measure which creates a rent, and then supporting measure which returns the rent

• Potential disadvantages: definite loss of 'scale' effect, possible partial loss of substitution effect

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Effectiveness of Mixes

• Difficult to assess the net 'marginal' contribution of individual measures as part of a mix

• OECD project: observations from seven OECD countries (US, Canada, France, Norway, Hungary, Germany, Japan

• > 4,000 facilities, 50 employees or more, all manufacturing sectors

• Rich characterisation of facility-level attributes and public environmental policy framework

• Possible to distinguish between: structural and economic factors, general policy context, specific policy instruments, interactions between policy instruments

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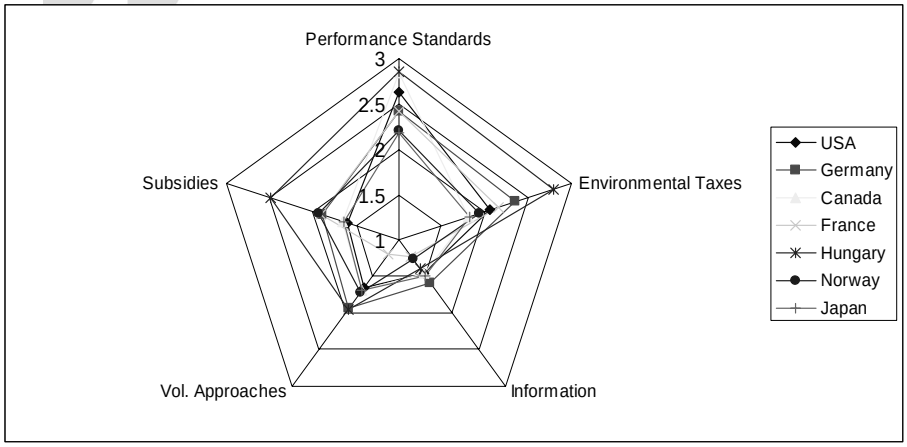
Evidence of Mixes



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Effectiveness of Mixes

- Probit analysis – disentangle specific role of policy instruments and identify possible complementarities
- Dependent variable - self-reported change in normalised emissions of regional/local air pollutants in last three years
- Inclusion of economic, structural factors, as well as environmental policy framework
- Mixes assessed on the basis of review of evidence of presence and possible motivations

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Effectiveness of Mixes

	Without Interaction Variables	With Interaction Variables
General Policy Framework		
Policy Stringency	0.117***	0.125***
Frequency of Inspections	0.004***	0.004***
Policy Instruments		
Performance Standard	0.041**	0.122***
Technology Standards	0.023	0.021
Pollution Tax/Charge	0.033	-0.017
Input Tax	-0.006	-0.012
Voluntary Agreement	0.021	0.027
Subsidy	0.012	0.017
Technical Assistance	0.004	-0.005
Policy Interaction Variables		
Performance Standard With Technical Assistance	-	-0.095*
Pollution Tax with Technical Assistance	-	0.119**

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Conclusions

- Frequent use of policy mixes in all areas, including area of regional and local air pollution
- There are a number of theoretical reasons indicating that it may be preferable to use a policy mix rather than a single instrument
- However, there is little evidence of explicit co-ordination or assessment of interactions
- Preliminary evidence indicates that technical assistance can play a complementary role with more 'flexible' instruments

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