



## **Environmental Compliance: Channels of Enforcement**

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## **Enforcement Channels**

- Monitoring and Enforcement Resources and Capabilities of Public Authorities
- Informal Community/Stakeholder Enforcement Channels
- Internal Self-Enforcement by the Officials within the Firm/Facility

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## Empirical Evidence

- Empirical assessment of public policy framework and environmental management, innovation and performance
- 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
- Influence of stakeholders, facility management structure and tools, commercial and economic factors

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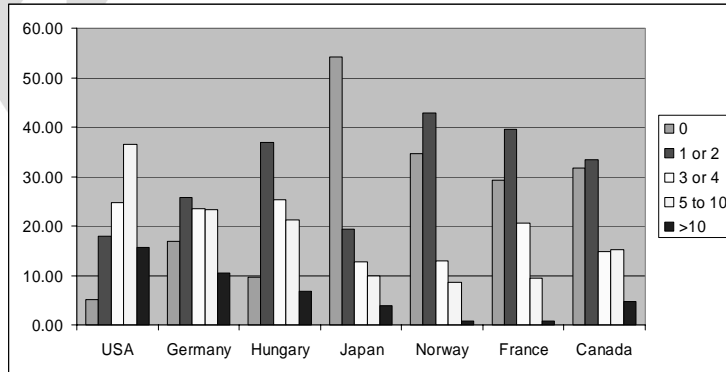


## Public Policy Framework

- Compliance as an ‘economic decision’: magnitude of penalties/sanctions and probability of enforcement
- In practice – both level of penalties/sanctions and probability of enforcement low
- Evidence – compliance levels often in excess of that which would be ‘optimal’ (and certainly different)
- Possible explanation – targeting of resources (past compliance behaviour, presence of EMS and other ‘signals’, structural characteristics)

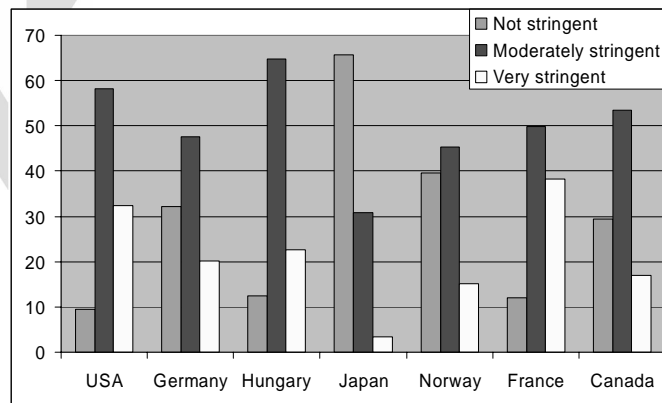
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## Inspections by Country



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## Perceived Stringency by Country



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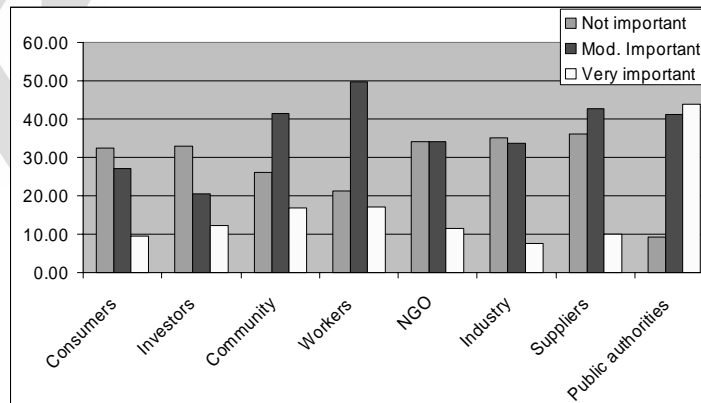
## Who gets Inspected? Results of Probit

- Larger firms more likely, but only significant > 500 employees
- More stringent is perceived policy stringency (endogeneity issue)
- Firms in some sectors (fuel products, chemical products, rubber/plastics) and countries (USA, Germany) more likely
- Environmental management/responsibility not used for targeting of inspections
- Market scope, quoted on stock exchange, etc... not used for targeting of inspections

## Community/Stakeholder Enforcement

- Informal channels through which enforcement can be encouraged
  - Financial markets (cost and access to capital)
  - Community/neighbourhood (permitting costs)
  - Consumers (marketing and branding)
  - Workers (labour productivity and turnover)
- Affects firm's compliance decision and may encourage
  - Supra-optimal levels of compliance
  - Beyond compliance behaviour

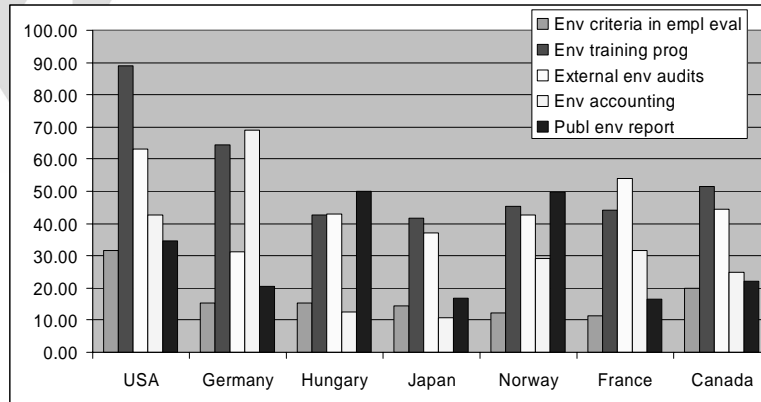
## Perceived Influence of Stakeholders



## Internal/Self Enforcement

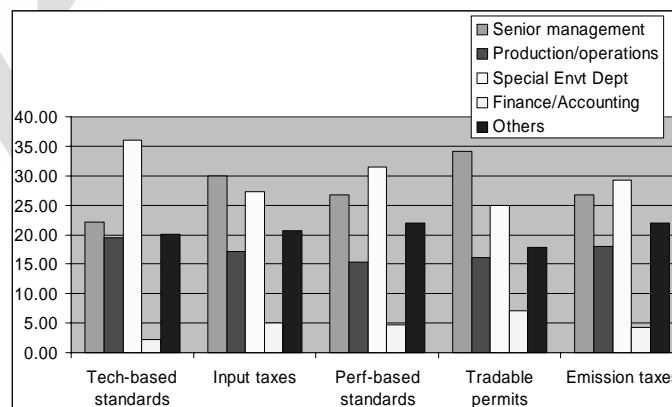
- Evidence that many instances of non-compliance are 'mistakes' and not deliberate
- Importance of internal control measures: information failures and principal-agent issues
- Environmental management systems and tools as a means of resolution
- Institutional location of responsible official can also be important

## Presence of Environmental Management Tools



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## Responsibility for Environmental Matters and Environmental Policy Instruments



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## Empirical Analysis

- Dependent variable – actions undertaken in previous three years across nine different environmental impact areas ( $\neq$  compliance)
- Examination of role of:
  - public policy framework (policy stringency and inspections)
  - stakeholders (financial, suppliers, workers, etc..)
  - self-enforcement (EM tools and location of official responsible)
- Inclusion of other explanatory variables (sector, country, size, market characteristics, etc....)
- Problem of endogeneity of inspections (targeting) – can not tease out effect on actions => use of simultaneous equation model

## Principal Results

	Air	Water
Public Policy		
Polstrng	0.46***	0.28***
Inspfreg	0.01***	0.02***
Stakeholders		
Consumers	N.S.	N.S.
Financial	N.S.	N.S.
Workers	0.20***	0.23***
NGO's	N.S.	N.S.
Self-Enforcement (tools)		
Training	0.17**	N.S.
Internal Audit	N.S.	0.16*
Eval/Comp	N.S.	N.S.
Accounting	N.S.	0.16**
Benchmarking	0.12*	0.17**
Self-Enforcement (location)		
Senior Mngmt	N.S.	0.21**
EHS	N.S.	0.23**
Prod/Ops	N.S.	0.53***



## Conclusions

- Compliance levels and patterns more complicated than simple models imply
- Public policy framework not exclusive means of enforcement, but limited empirical evidence on ‘other’ channels
- Preliminary results:
  - public policy most important
  - workers only stakeholder of influence
  - some tools matter – training, accounting, benchmarking
  - location of environmental responsibility matters (water)