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Environmental Management Systems and Practices: An International Perspective

Irene Henriques and
Perry Sadorsky
Schulich School of Business, York University
and Sandor Kerekes, Budapest University

Schulich School of Business

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Objective

- Draws on stakeholder theory (Freeman, 1984; Mitchell et al. 1997), the resource-based view (RBV – Barney, 1991) of the firm and environmental economics to address the following questions:
  1. What factors influence whether or not a facility will implement an EMS?;
  2. What factors influence whether a facility hires a person explicitly responsible for environmental matters?;
  3. What factors influence whether or not a facility will certify its EMS?; and
  4. What factors influence the comprehensiveness of a facility's EMS?

Hypotheses: Stakeholder Theory

- H1a: Greater pressure from public authorities increases the likelihood that the facility implements environmental initiatives.
- H1b: Greater pressure from head office has an uncertain impact on the likelihood that the facility undertakes environmental initiatives.
- H1c: The greater the pressure exerted by commercial buyers, the more likely the facility will implement environmental initiatives

Hypotheses: Stakeholder theory

- H1d: Facilities whose firm is listed on a stock exchange are more likely to implement environmental initiatives.
- H1e: Greater pressure from environmental groups has an uncertain impact on a facility's decision to implement environmental initiatives.
- H1f: Foreign ownership has an uncertain impact on a facility's decision to implement environmental initiatives.

Hypotheses: RBV of firm

- H2a: Facilities that undertake environmental R&D are more likely to implement environmental initiatives.
- H2b: The greater a facility's financial performance, the greater its ability to commit to environmental initiatives.
- H2c: Facilities that have implemented a QMS are more likely to implement environmental initiatives.

Hypotheses: RBV of firm

- H2d: Facilities that view the impact of voluntary agreements as being significant are more likely to intensify their environmental initiatives.
- H2e: The greater the pressure exerted by employees, the more likely the facility will implement environmental initiatives.
- H2f: The greater a facility's export orientation, the more likely the facility will implement environmental initiatives.

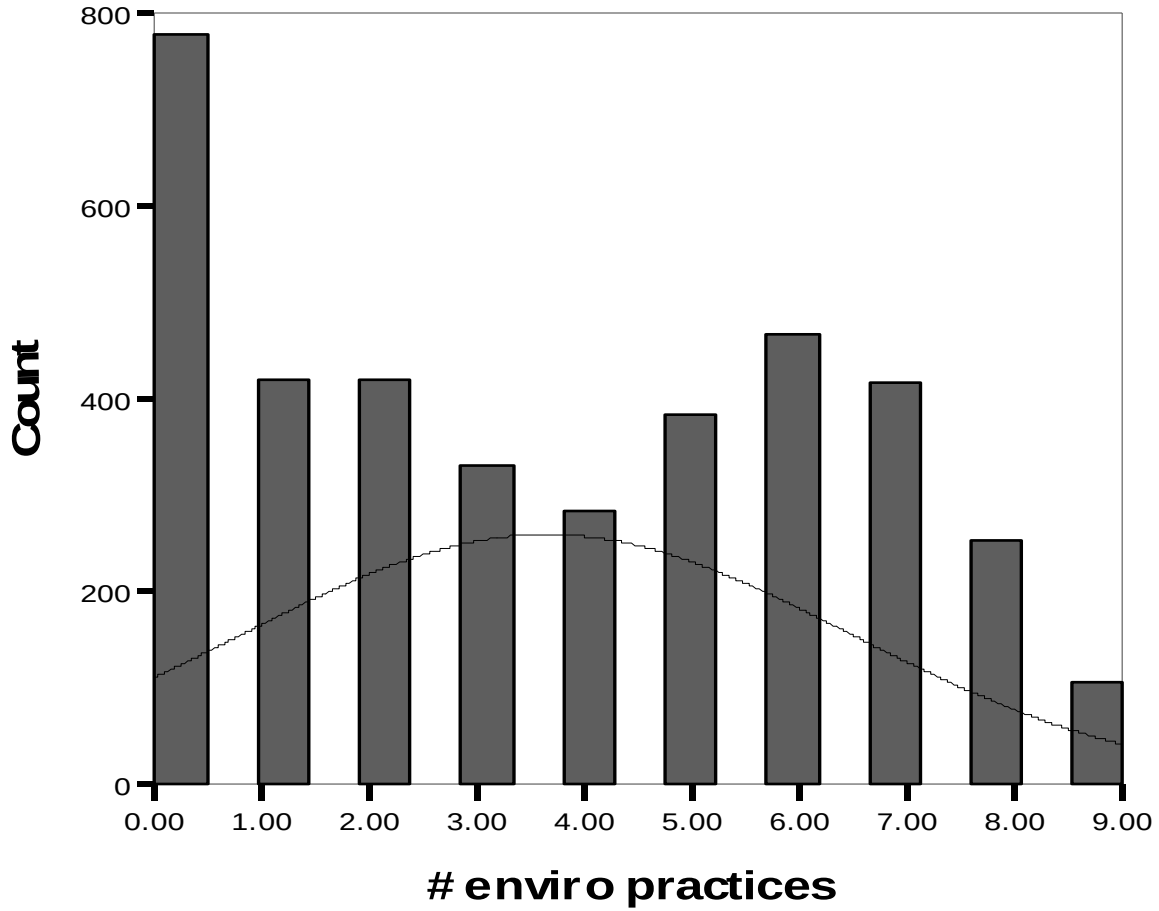
Hypotheses: Environmental & Regulatory Economics

- H3a: Government sponsored technical assistance programs will reduce (increase) the likelihood that facilities implement their own environmental initiatives if such programs are viewed as substitutes (complements).
- H3b: Facilities that take advantage of code of conduct programs that require or promote EMSs are more likely to implement environmental initiatives.
- H3c: The greater the number of inspections a facility receives, the more likely the facility will adopt environmental initiatives.

Dependent Variables

- Has your facility implemented and environmental management system (EMS)?
- Does your facility have at least one person with explicit responsibility for environmental matters (PERSENV)?
- Has your facility acquired any of the following certifications in environmental management – ISO 14001 and/or EMAS (CERTIF)?
- For each facility, we took the sum of the number environmental practices (COUNT) which ranges from 0 (none) to 9 (all). (Anton et al. 2004)

Distribution of the number of environmental practices



Independent Variables

- **Stakeholder pressures**: INFLPAUT, INFLCORP, INFLBYRS, INFLENGO, FRMINTL, FRMQUOT
- **Resources and capabilities**: FACRDENV, FACBERF; INFLWORK, OMPQMS, MRKTSCOP, VOLAGR
- **Policy variables**: INSPFREQ, PRGEMP, TECHASS
- **Controls**: FACEMP, IMPNR, country and industry dummies

Empirical Methods

- EMS decision: Probit model
- Decision to have a person responsible for environmental matters: Probit model
- Decision to certify ISO 14001 or EMAS: Heckman selection model (two stage procedure which corrects for sample selection bias in the probit analysis).
- Determinants of the comprehensiveness of a facility's EMS: Poisson model

Results: Stakeholder Influence

Independent Variables	Model 1: EMS	Model 2: PERSENV	Model 3: CERTIF	Model 4: COUNT
Constant	-	-	-	
H1: Stakeholder Pressures				
H1a: Influence of public auth.	-			-
H1b: Influence of head office	+	+	+	+
H1c: Influence of comm. buyers	+		+	+
H1d: Quoted on stock exchange	+			+
H1e: Influence of ENGOs				
H1f: Foreign owners				+

Results: Resources & Capabilities

Independent Variables	Model 1: EMS	Model 2: PERSENV	Model 3: CERTIF	Model 4: COUNT
H2: Resources & Capabilities				
H2a: Facility enviro. R&D	+		+	+
H2b: Facility business perform.		+		+
H2c: QMS	+	+	+	+
H2d: Voluntary agreements	+	+	+	+
H2e: Influence of workers	+	+		+
H2f: Export orientation	+	+	+	+

Results: Regulatory enforcement & environmental programs

Independent Variables	Model 1: EMS	Model 2: PERSENV	Model 3: CERTIF	Model 4: COUNT
H3: Regulatory enforcement & environmental programs				
H3a: Technical assistance programs	-	-	-	-
H3b: Programs & policies that encourage EMS	+	+	-	+
H3c: Inspection frequency		+		+

Results: Controls

Independent Variables	Model 1: EMS	Model 2: PERSENV	Model 3: CERTIF	Model 4: COUNT
Controls (industry dummies not presented)				
Facility size	+	+	+	+
Importance of natural resources	+	+	+	+
Germany		-	+	-
Hungary		-	+	-
Japan	+	-	+	-
Norway	+	+	+	
France			+	-
Canada		-		-
Lambda	**Na**	**Na**	+	**Na**
Log likelihood	-836.25	-593.19	-196.24	-3465.53
Number of observations	1567	1641	700	1552

Discussion: Managerial implications

- In general, a facility's resources and capabilities (Barney, 1991) play a critical role in affecting the level of environmental initiatives across the seven OECD countries.
- Organizations are not immune to external pressures (Freeman, 1984; Mitchell et al. 1997). Stakeholder impacts differed across environmental initiatives. Surprisingly, the influence of public authorities reduced the likelihood that a facility would adopt an EMS or a more comprehensive EMS.

Policy implications

- Technical assistance programs appear to act as a substitute to the implementation of environmental initiatives.
- Although government programs that encourage EMSs appear to increase a facility's adoption of an EMS, the hiring of an individual responsible for environmental matters and the comprehensiveness of its EMS, it also reduces the likelihood that the facility will have its EMS certified.
- Although facilities view regulatory pressures as having a negative influence on a facility's decision to implement an EMS or increase its comprehensiveness, greater monitoring encourages facilities to invest in environmental initiatives via the hiring of persons responsible for environmental issues and implementation of a greater number of practices.

Conclusions & Future Research

- Although resources and capabilities appear to have a clear impact across all environmental initiatives, the impact of stakeholder pressures appears to differ depending on the environmental initiative. This is especially true in the case of certification.
- Although in our comprehensive measure 9 practices is indeed better than 0, this variable does not necessarily measure the quality of the EMS since the implementation of, say three practices, may not be the same across facilities. We are now in the process of developing a weighted measure of comprehensiveness (across countries and industries) that can account for “quality”.

Thank you