"ENVIRONMENTAL AUDITS AND INCENTIVE COMPENSATION"

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ENVIRONMENTAL AUDITS AND INCENTIVE COMPENSATION[1]

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Abstract

This paper studies the link between environmental audits and employee compensation. The context is a one-period principal-agent relationship where the risk-averse agent must allocate effort between financial and environmental tasks. The former are routinely monitored while the latter are audited (at some cost) only under specific circumstances. We find that the optimal wages have a lower mean and a greater variance when there is an environmental audit than when there is not. This puts more risk on the agent, so the expected wage *ex ante* must be higher than in a situation with no environmental audits. We also find that the agent might just split his effort between environmental and financial tasks, provided the information gathered using environmental audits is about as accurate as that coming from financial monitoring.

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[1]A previous draft of this paper was presented at the fifth annual conference of EAERE in Dublin and at the 1994 Journées du GREEN, Université Laval, Québec city. We are grateful to the participants of our sessions for their comments. We also thank Olivier Cadot, John Hartwick and especially John Braden, our discussant in Dublin, for many useful suggestions. This research was supported by the Center for the Management of Environmental Resources of INSEAD.

1. Introduction

Internal environmental audits are the most commonly used tool of "green management" [see 5, 14, 15, 16, 17]. Yet the uses managers make of the results of environmental audits, and thus the motives for conducting them, have to the best of our knowledge, never been formally examined. Are audits principally of value for external reporting in response to government pressure?[2] For risk analysis and reduction?[3] For identifying wasteful production practices?[4] In response to demands of local communities, customers, banks, and insurers?[5] To forestall unwanted regulatory mandates?[6] As an input to incentive compensation systems? And how do answers to these questions influence the amount and type of auditing that firms do?

This paper begins to attack some of these broad questions by examining the link between environmental audits and employee compensation. The necessity of linking managerial rewards with audit results is obvious. Yet ironically, surveys of actual practice [5, 14, 17] suggest that even

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[2] In the United States, for example, companies are required to report to the Securities and Exchange Commission about prospective environmental liabilities, and to report emissions of any of the 300 substances on the Toxic Release Inventory.

[3] Monsanto has set a five-year plan to cut air emissions of toxic chemicals by 90% and presents its progress in a publicly released environmental report. Another major chemical firm, Union Carbide, audits its compliance with the industry's "Responsible Care" programme which sets targets and means for environmental risk reduction.

[4] Danish Steel Works, for example, measures various environmental resource inputs and outputs of both pollutants and products. The German textile manufacturer, Kunert, similarly calculates and publishes its "eco-balance sheet".

[5] B&Q, one of Britain's biggest do-it-yourself retailer, requires such information from all its vendors.

[6] This is reportedly one of the reasons for business interest in the British Standards Institute's BS7750 on environmental management. Regular internal environmental audits appear as a criterion for meeting the standard, and widespread adoption of BS7750 might forestall European Commission regulatory initiatives. [*The Economist*, May 16, 1992].

The EU published a draft proposal for a system of environmental audits in December 1990 [see reference 3]. The proposal entailed mandatory audits, validation by registered environmental auditors, and public disclosure of audits results. Subsequent drafts have dropped the mandatory features. No directive has been passed to date.

sophisticated companies lack a clear sense of how the link should be made. Rarely is it made explicit; more commonly it is *de facto*. We submit that some recent developments in environmental and managerial economics can provide a first grasp at the nature and scope of this link.

There exists a wide literature on corporate audits. This literature distinguishes two kinds of audits: those aiming to verify a declared outcome, for example an announced return [11, 13], and those that provide information on a key input, for example the agent's effort [1, 4]. We will focus on the latter kind. Our model is similar to the principal-agent one used by Baiman and Demsky [1]. The main issue here, however, is not the total amount of effort that the agent delivers but rather the *allocation* of this effort between environmental and non-environmental tasks. Hence, building on our earlier work [6], we use a *multi-task* principal-agent model. Multi-task principal-agent models have been proposed only recently to analyse several contractual issues such as job design [2, 8], asset ownership [8], and compensation [6, 8]. In those models, the agent must allocate effort between, say, a financial task and an environmental task. This allocation cannot be observed by the principal. The principal can only infer the agent's effort from some imperfect measure of performance on each task. Our previous work entailed costless and constant monitoring of the variable of interest - the agent's effort on each task. In reality, every monitoring system is costly, so the principal may decide against constant monitoring. In this paper we assume that financial performance is always monitored, but we endogenize the principal's decision to audit environmental performance.

The paper is organized as follows. The next section is devoted to presenting the multi-task principal-agent model. The method by which we solve this model - the first-order approach - is sketched in section 3. Section 4 contains our main results. Section 5 concludes the paper.

2. The model

Consider a one-period principal-agent relationship in which the agent must split his effort between traditional profit-generating activities and environmental protection. Let the amount of effort spent on profit-generating activities and environmental protection be denoted by x and y respectively. The agent can vary both his total effort and the allocation of that effort between the two tasks. The principal can observe neither the agent's total effort nor its allocation; she can, however, monitor the agent and receive estimates π and ϵ of the revenues generated or environmental costs reduced by the agent's effort, the vector (x,y). These estimates are drawn from finite subsets of real numbers according to the likelihood function $g(\pi,\epsilon/x,y)$.[7] We shall make the following assumptions concerning g.

ASSUMPTION 1: $g(\cdot/x,y)$ is strictly positive on its domain, for all x, y. At each vector (π,ϵ), it is twice continuously differentiable in (x,y).

Effort on traditional profit-generating tasks is easily and routinely monitored through the firm's standard financial reporting system. By contrast, efforts to protect the environment are difficult to monitor, and environmental audits are necessarily infrequent at best. On the basis of the information available (π) from financial monitoring, the principal may audit the agent with probability $m(\pi)$. Although efforts on the two activities differ in terms of ease of monitoring, let us assume that the consequences of each can be denominated in expected financial values. This is clear enough in the

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[7] Assuming that the set of signals is finite instead of continuous does not bear any consequences on results. It just simplifies the exposition.

case of fines for environmental damage. Let us assume as well that financial values can be assigned to less explicit costs or benefits of environmental performance such as its impact on company reputation to customers, employees, shareholders, and community residents. If an environmental audit is done, a fixed cost K is incurred and the estimate ϵ, which can be positive or negative, is received. The principal then corrects her estimate of expected total profit (before wage and audit costs) to $\pi+\epsilon$.

We shall suppose that, conditional on (x,y), π and ϵ are independent. That is, the only relationship between π and ϵ comes through the agent's effort allocation. Thus, we can write the likelihood function g as the product of two one-dimensional distributions, that is

$$g(\pi,\epsilon|x,y) = f(\pi|x)\, h(\epsilon|y) \ .$$

The principal is assumed to be risk neutral. The agent's behavior fits the following assumptions.

ASSUMPTION 2: The agent has a utility $U:(z,\infty)\to\mathbb{R}_+$ for money that is strictly increasing, continuously differentiable, and exhibits strict risk aversion (i.e., U is strictly concave). Moreover, U is such that twice the coefficient of risk aversion (-U"/U') is at least as large as the so-called *coefficient of prudence* (-U'''/U").[8]

ASSUMPTION 3: An effort vector (x,y) costs the agent $C(x+y)$, where the function $C:\mathbb{R}_+\to\mathbb{R}_+$ is increasing, convex and twice continuously differentiable. $C(0) = 0$, $C'(0) = 0$, and $C'(\infty) = \infty$.

The first part of assumption 2 is a standard one. The second part, however, is peculiar to this model

[8] Risk aversion is a key concept for the analysis of choices under uncertainty. A related notion, that of *prudence*, was recently introduced in the finance literature by Kimball [10] to measure the strength of precautionary savings motives.

(it is used in proposition 1 below), but it is satisfied by a very broad class of utility functions (for example those exhibiting constant absolute risk aversion). Assumption 3 implies that the agent is indifferent *ex ante* to effort spent on profit-generating activities or environmental protection.[9] There is no constraint on the agent's effort level, but total effort has rising marginal cost.

The principal can now offer two kinds of employment contract to the agent. One is a wage dependent only on measured performance on the traditional profit-generating activities. In this case, there are no environmental audits, and that fact is known for certain to both the principal and the agent. The second contract includes the possibility that the agent may be subject to an unannounced environmental audit, and his wage will be conditional in part on the audit results. How frequently, or whether, audits are actually done under this contract is then for the principal to decide. In this context, the principal offers the agent a contract that pays him a wage of either $s(\pi)$ when only the estimate π is gathered, or $w(\pi, \epsilon)$ if the agent is audited. This contract must provide the agent with a utility at least equal to his reservation utility U^*. It must also motivate the agent who always sets his effort level and allocation in order to maximize his own satisfaction. The contract which binds together the principal and the agent is then a solution to:

$$\max_{m,s,w,x,y} \sum_{\pi,\epsilon} [m(\pi)(\pi + \epsilon - w(\pi,\epsilon) - K) + (1 - m(\pi))(\pi + \epsilon - s(\pi))]g(\pi,\epsilon \mid x,y)$$

$$\textit{subject to}:$$

$$(x,y) \in \arg\max_{x,y} \sum_{\pi,\epsilon} [m(\pi)U(w(\pi,\epsilon)) + (1 - m(\pi))U(s(\pi))]g(\pi,\epsilon \mid x,y) - C(x+y) \qquad (1)$$

$$\sum_{\pi,\epsilon} [m(\pi)U(w(\pi,\epsilon)) + (1 - m(\pi))U(s(\pi))]g(\pi,\epsilon \mid x,y) - C(x+y) \geq U^*$$

[9] The principal's risk neutrality and the agent's indifference between tasks are not crucial assumptions but they considerably simplify the analysis.

This is a typical principal-agent problem, with multiple tasks and signals.[10] The principal selects the wage schedule that maximizes her expected payoff under incentive compatibility and participation constraints. Another decision variable for the principal here is *m(π)*, the probability of auditing the agent following the observation of the profit estimate π.

The description of the model is now complete, so we can now turn to its solution .

3. Method used to solve the model

This section outlines the method that we use to solve the above principal-agent model.

The first constraint of problem (1) - incentive compatibility - encompasses a continuum of inequalities. To make the problem tractable, we shall therefore replace the incentive compatibility constraint by the first-order necessary conditions for having a stationary point of the agent's expected utility. This yields the relaxed problem:

$$\max_{m,s,w,x,y} \sum_{\pi,\epsilon} [m(\pi)(\pi + \epsilon - w(\pi,\epsilon) - K) + (1 - m(\pi))(\pi + \epsilon - s(\pi))] g(\pi,\epsilon \mid x,y)$$

$$subject \quad to:$$

$$\sum_{\pi,\epsilon} [m(\pi)U(w(\pi,\epsilon)) + (1 - m(\pi))U(s(\pi))] g_x(\pi,\epsilon \mid x,y) - C'(x+y) \geq 0$$

$$\sum_{\pi,\epsilon} [m(\pi)U(w(\pi,\epsilon)) + (1 - m(\pi))U(s(\pi))] g_y(\pi,\epsilon \mid x,y) - C'(x+y) \geq 0 \qquad (2)$$

$$\sum_{\pi,\epsilon} [m(\pi)U(w(\pi,\epsilon)) + (1 - m(\pi))U(s(\pi))] g(\pi,\epsilon \mid x,y) - C(x+y) \geq U^*$$

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[10] The name "multi-task principal-agent problem" might leave the impression that the agent is actually performing several different assignments simultaneously, which he is not. An example of what we have in mind here is, for instance, a project evaluator who might be more or less careful in assessing the environmental impact of a proposal along with its financial prospects. John Hartwick suggested that we rather label the above problem a "multi-impact principal-agent problem". This indeed indicates better the generic situation that we are modelling.

Solving problem (1) by solving this relaxation of it instead is called the **first-order approach**. It is certain to work provided a solution to problem (2) exists and the following assumptions restricting the class of likelihood functions hold (see Sinclair-Desgagné [12]).

ASSUMPTION 4: [Monotone likelihood ratio property] The ratios $g_x(\pi,\epsilon/x,y)/g(\pi,\epsilon/x,y)$ and $g_y(\pi,\epsilon/x,y)/g(\pi,\epsilon/x,y)$ are nondecreasing in (π,ϵ), for every vector (x,y).[11]

ASSUMPTION 5: [Convexity of the distribution function condition] The upper cumulative probabilities of either π or ϵ are concave in (x,y).

ASSUMPTION 6: The first two constraints of problem (2) are *both* either strictly binding or nonbinding.

For an interpretation of these assumptions and a history of the first-order approach, see [12].

4. Analysis

We shall now derive and analyse the main propositions. Subsection 4.1 below contains the results concerning incentive compensation. Optimal audits are described in subsection 4.2. The agent's resulting effort allocation is studied in subsection 4.3.

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[11] The subscripts $_x$ and $_y$ denote partial derivatives with respect to x and y respectively.

4.1 Optimal compensation

The principal's optimal wage schedule must satisfy the first-order necessary conditions for an optimum of problem (2). Let γ, λ, δ be the Lagrange multipliers attached to the first, second and third constraints of (2) respectively. The first two multipliers, γ and λ, are the shadow prices of the incentive compatibility constraints for tasks x and y respectively. They show the increase in the principal's profit resulting from a marginal deviation of the agent from his utility-maximizing effort allocation on x and y respectively. The third multiplier, δ, is the shadow price of the participation constraint which shows the increase in the principal's profit from a marginal decrease in the agent's reservation utility, U^*. The necessary conditions for s - the wage without an environmental audit - are now:

$$\forall \pi: \quad (1-m)\sum_{\epsilon} \left[-fh + \gamma U'(s) f_x h + \lambda U'(s) f h_y + \delta U'(s) f h \right] = 0. \tag{3}$$

Those conditions for w - the wage after an environmental audit is made - are:

$$\forall (\pi, \epsilon): \quad m \left[-fh + \gamma U'(w) f_x h + \lambda U'(w) f h_y + \delta U'(w) f h \right] = 0. \tag{4}$$

Given these equations, the following proposition states some general features of the wage schedule.

PROPOSITION 1: Under the above assumptions, $s(\pi)$ and $w(\pi, \epsilon)$ have the following properties:

i) s and w are nondecreasing in their respective arguments.

ii) If $\lambda > 0$, then $s(\pi) > w(\pi, \epsilon)$ when ϵ is small and $s(\pi) < w(\pi, \epsilon)$ when ϵ is large.

iii) $\sum_{\epsilon} h(\epsilon/y) w(\pi, \epsilon) < s(\pi)$.

PROOF:

First note that when $m(\pi) = 1$ or 0, the wages $s(\pi)$ or $w(\pi,\epsilon)$ can always be set so that the above statements be satisfied.

Suppose now that $0 < m(\pi) < 1$. Then, after some straightforward algebra, equations (3) and (4) can be rewritten respectively as

$$\frac{1}{U'(s(\pi))} = \delta + \gamma \frac{f_x(\pi \mid x)}{f(\pi \mid x)} \quad , \tag{5}$$

and

$$\frac{1}{U'(w(\pi , \epsilon))} = \delta + \gamma \frac{f_x(\pi \mid x)}{f(\pi \mid x)} + \lambda \frac{h_y(\epsilon \mid y)}{h(\epsilon \mid y)} \quad . \tag{6}$$

The multipliers γ and λ are nonnegative. Hence, by assumptions 2 and 3,

(i) $s(\pi)$ and $w(\pi, \epsilon)$ are nondecreasing in their arguments.

Substracting (6) and (7), one also gets that

$$\frac{1}{U'(s(\pi))} - \frac{1}{U'(w(\pi , \epsilon))} = -\lambda \frac{h_y(\epsilon \mid y)}{h(\epsilon \mid y)} \quad . \tag{7}$$

Since $\Sigma_\epsilon\, h_y(\epsilon/y) = 0$ and h_y/h is nondecreasing in ϵ, it must be the case that $h_y(\epsilon/y) < 0$ when ϵ is small and $h_y(\epsilon/y) > 0$ when ϵ is big. Considering equation (7), this entails that

(ii) $s(\pi) > w(\pi, \epsilon)$ when ϵ is small, and $s(\pi) < w(\pi, \epsilon)$ when ϵ is large.

Finally, multiplying equation (6) by $h(\epsilon/y)$, summing up with respect to ϵ and substracting from (5) gives

$$\frac{1}{U'(s(\pi))} - \sum_{\epsilon} h(\epsilon \mid y) \frac{1}{U'(w(\pi , \epsilon))} = 0 \quad . \tag{8}$$

Since $1/U'(\cdot)$ is a strictly convex function by assumption 2, then

$$\frac{1}{U'(s(\pi))} - \frac{1}{U'(\sum_{\epsilon} h(\epsilon|y)w(\pi,\epsilon))} > 0 \qquad (9)$$

by Jensen's inequality. Hence,

(iii) $\Sigma_{\epsilon}\, h(\epsilon/y)w(\pi,\epsilon) < s(\pi)$.

Assertions (i), (ii) and (iii) then hold for all (π,ϵ).

Q.E.D.

Part (i) of the proposition says that wages rise with better performance on the audited tasks. According to (ii), if the incentive constraints are strictly binding, the wage range with an audit spans the wage range without one. So an agent may be either better or worse paid after an environmental audit. The wage gradient is steeper and the agent is bearing more risk. The left-hand term of (iii) is the expected wage if an audit were to take place. Thus, if the employment contract includes the probability of an audit, the expected wage is lower if an audit is conducted than if it is not.

This has several implications. One is that even a risk-neutral agent will not want to be audited. The assumption that the agent is risk-averse only exacerbates his distaste for audits. This is consistent with the casual observation that environmental audits must overcome resistance from those audited. Second, an employment contract including the probability of an environmental audit must pay a higher expected wage than a contract without any such possibility. Finally, the agent with a contract including audits has an incentive to quit just prior to being audited if the audit is announced ahead of time and if quitting can be done costlessly. Hence, the audit must be unexpected and wages must be paid at the end of each period.

4.2 Optimal audits

The first-order necessary conditions for m(·) - the probability of making an environmental audit - in problem (2) are given by

$$\forall\ \pi : (s - K - \sum hw) + (\sum U(w)h - U(s))(\delta + \gamma\frac{f_x}{f}) + \lambda\sum U(w)h_y \begin{array}{ll} \geq 0 & m = 1 \\ = 0 \quad if & 0 < m < 1 \\ \leq 0 & m = 0 \end{array} \quad . \tag{10}$$

This yields the following proposition.

PROPOSITION 2: When $m(\pi) > 0$, $\lambda\Sigma_\epsilon\ U(w(\pi,\epsilon))h_y \geq K$.

PROOF:

Using equation (5), the second term of expression (10) can be written as

$$\frac{U(s) - \sum hU(w)}{U'(s)} \geq \frac{U(s) - U(\sum hw)}{U'(s)} \qquad by\ Jensen\text{'s}\ inequality\ ,$$

$$\geq \quad s - \sum hw \qquad by\ the\ concavity\ of\ U.$$

Substituting the latter term back into expression (10) yields the desired result.

Q.E.D.

The left-hand expression in proposition 2 is the marginal benefit to the principal of the agent's optimal reallocation of effort towards environmental protection caused by the possibility of an environmental audit. The proposition states that a necessary condition for the principal to set a positive probability of an environmental audit is that this term exceeds the cost of the audit. As shown by (10), if that cost increases, the probability of an audit will decrease. If audits are costly enough, there will be no audits *de facto*, and the principal will no longer include the contractual possibility of an audit. The proposition makes it clear, however, that the principal would not necessarily audit with certainty even if audits were free.[12] The principal sets a positive probability of holding environmental audits only if the agent's behavior is somewhat responsive to such a threat.

3.3 The allocation of effort

A contract that includes the possibility of environmental audits raises the principal's cost in two ways compared with a contract without any audits. It raises the expected wage cost and it entails the direct cost of the audits. Offsetting this, however, is the gain in profits that comes about from the reallocation of the agent's effort that the threat of audits induces. The effort that the agent finally puts into environmental protection depends on the *relative* accuracy of the audits.

PROPOSITION 3: Let π and ϵ have the same conditional distribution. Then the agent devotes as much effort to profit generation as to environmental protection.

PROOF:

The necessary conditions for x are given by

$$\sum_{\pi,\epsilon} m(\pi)[(\pi+\epsilon-w-K)g_x+U(w(\pi,\epsilon))(\gamma g_{xx}+\lambda g_{xy})]$$

$$+\ (1-m(\pi))[(\pi+\epsilon-s)g_x+U(s(\pi))(\gamma g_{xx}+\lambda g_{xy})]-(\gamma+\lambda)C''(x+y)=0.$$

[12] This supports the current position of the International Chamber of Commerce [16], which is sympathetic to the principle of audits but hostile to any scheme of mandatory audits.

Notice that the necessary conditions for y are exactly the same under the above assumption. This proves the desired statement.

Q.E.D.

This proposition entails that as long as the results of environmental audits are about as reliable as those from monitoring profit-seeking activities, the agent would split his effort evenly between environmental and financial tasks.[13] This result may seem unsurprising: it is well known in the literature [see, for instance, 7 and 9] that the (absolute, however, not relative) accuracy of the monitoring technology is a key parameter for agency relationships. The last proposition makes it clear, however, that one can tackle an agency problem in the environmental sphere by using as a benchmark the technology that is routinely used for monitoring the agent's actions on the financial side.

4. Conclusion

This paper studied the link between environmental audits and managerial incentive compensation. We have shown that the presence of environmental audits affects the optimal wage structure and the agent's allocation of effort. Wages after an environmental audit has been performed have a lower mean and higher variance than those paid when there is no audit. Provided environmental audits are not so inaccurate relative to the technology used for financial monitoring,

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[13] Of course this statement depends on the probability of an environmental audits being positive at some values of π.

the agent also allocates more effort to protect the environment when there is a threat of being subject to environmental audits.

The results presented here certainly do not answer all the questions surrounding the use of audits. Further research in this area is much needed. Business firms await some fresh and well-grounded insights concerning the purpose and use of environmental audits. We hope to have shown that academics have tools that may help provide such insights.

REFERENCES

1. S. Baiman and J. S. Demski, Economically optimal performance evaluation and control systems, *J. Accounting Research* **18**, 184-220 (1980).

2. D. Bergemann, "Multiple tasks in the principal-agent model," CARESS Working Paper #92-33, University of Pennsylvania (1992).

3. Commission of the European Communities, "A Consultation Paper on Draft Elements for a Council Directive on the Environmental Auditing of Certain Industrial Activities", document No. XI/632/90 (1990).

4. R. A. Dye, Optimal monitoring in agencies, *Rand J. Econom.* **17**, 339-350 (1986).

5. M. Flaherty and A Rappoport, "Multinational corporations and the environment: A survey of global practices," The Center for Environmental Management, Tufts University (1991).

6. H. L. Gabel and B. Sinclair-Desgagné, Managerial incentives and environmental compliance, *J. Environ. Econom. Management*, **24**, 229-240 (1993).

7. B. Holmström, Moral hazard and observability, *Bell J. Econom.* **10**, 74-91 (1979).

8. B. Holmström and P. Milgrom, Multitask principal-agent analyses: incentive contracts, asset ownership, and job design, *J. Law, Econom. and Org.* **7**, 24-52.

9. S. K. Kim, "Efficiency of an information system in an agency model," Mimeo, Hong Kong University of Science and Technology (1993).

10. M. S. Kimball, "Precautionary Savings in the Small and in the Large", *Econometrica* **58**, 53-73 (1990).

11. D. Mookherjee and I. Png, "Optimal Auditing, Insurance and Redistribution", *Quarterly J. Econom.* **104**, 399-415 (1989).

12. B. Sinclair-Desgagné, The first-order approach to multi-signal principal-agent problems, *Econometrica* **62**, 459-465 (1994).

13. R. M. Townsend, Optimal contracts and competitive markets with costly state verification, *J. Econom. Theory* **21**, 265-293 (1979).

14. A survey of industry and the environment, *The Economist* **23** (1990).

15. Corporate Responses to the Environmental Challenge," McKinsey and Company (1991).

16. "Environmental Auditing," position paper on environmental auditing, International Chamber of Commerce (1989).

17. "Managing the Environment. The Greening of European Business," Business International Ltd, London, UK (1990).