

# The informational value of environmental taxes\*

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## Abstract

We investigate the design of a pollution standard when the firms abatement costs are unknown and emissions are taxed. A firm might abate beyond what is required by the standard by equalizing their marginal abatement costs to the tax rate, thereby revealing information about its abatement cost. We analyze how a regulator can take advantage of this information to design the standard. The tax is used as a separating device: the standard is relaxed to induce informational revelation about abatement costs. It is then strengthened at a higher rate for the low-cost firms. Updating standards generates a ratchet effect: the low-cost firms might strategically hide their cost by abating no more than required by the standard. We provide conditions for which the separating equilibrium survives with strategic firms. We show that higher tax rates induce more information revelation and, therefore, more stringent standard update. Next, we bring our theoretical results to data in the case NOx regulation of stationary pollution sources in Sweden. We found evidence that firms experience more frequent standard updates when their emissions are taxed.

## 1 Introduction

The economic literature traditionally argues for the general superiority of market-based policy instruments over command-and-control regulation, primarily because of the relative cost

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