

# Achieving an Environmental Target with an Emissions Tax under Incomplete Enforcement

Marcelo Cafferla <sup>a \*</sup>, Carlos Chávez <sup>b</sup>

<sup>a</sup> Department of Economics, Universidad de Montevideo, Prudencio de Pena 2440, CP 11600, Montevideo, Uruguay

<sup>b</sup> Department of Economics, Universidad de Concepción, Casilla 1987, Concepción Chile. Phone: (56 41)2203067, Fax: (56 41) 2254591, E-mail: cchavez@udec.cl.

**Abstract:** To set an emission tax consistent with a given environmental target, the regulator must know the firms' abatement cost functions. But this is never the case. Most of the textbooks in environmental economics have argued that this problem can be solved by a trial and error process through which the regulator imposes a tax level, then observes firms' emissions and adjusts the tax accordingly. We explore the consequences of using this type of rule on the possibility of achieving the aggregate emissions target in the context of incomplete enforcement and propose a simple alternative rule. Our results indicate that: (i) by using the trial and error process, the regulator is unable to set the appropriate tax level; consequently, the environmental target can never be reached; and (ii) the simple alternative rule that we propose allows the regulator to set the proper level of the tax based upon all the relevant information received from the firms.

*JEL:* L51, Q28

**Keywords:** Emissions Taxes, Under-reporting, Enforcement.

---

\* Corresponding author. Phone: (598 2)7074461 ext. 308, Fax: (598 2) 7074461 ext. 325, E-mail: [marcaffera@um.edu.uy](mailto:marcaffera@um.edu.uy). We gratefully acknowledge partial financial support for this collaborative research provided by the Facultad de Ciencias Económicas y Empresariales, Universidad de Montevideo; Facultad de Ciencias Económicas y Administrativas, Universidad de Concepción; and Dirección de Investigación, Universidad de Concepción.