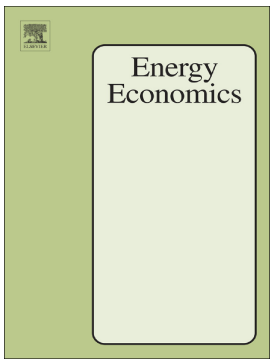

Second-Best Taxation for a Polluting Monopoly with Abatement Investment

Guiomar Martín-Herrán, Santiago J. Rubio

PII: S0140-9883(18)30186-5
DOI: doi:10.1016/j.eneco.2018.05.019
Reference: ENEECO 4031

To appear in:

Received date: 12 May 2017
Revised date: 27 April 2018
Accepted date: 11 May 2018

Please cite this article as: Guiomar Martín-Herrán, Santiago J. Rubio , Second-Best Taxation for a Polluting Monopoly with Abatement Investment. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Eneeco(2018), doi:10.1016/j.eneco.2018.05.019

Second-Best Taxation for a Polluting Monopoly with Abatement Investment

Guiomar Martín-Herrán[a,*], Santiago J. Rubio[b]

[a] *IMUVA and Department of Applied Economics, University of Valladolid, Spain.*
[b] *Department of Economic Analysis and ERI-CES, University of Valencia, Spain.*

Abstract

This paper characterizes the optimal tax rule to regulate a polluting monopoly when the firm has the possibility of investing in an abatement technology and the environmental damages are caused by a stock pollutant. The optimal policy is given by the stagewise feedback Stackelberg equilibrium of a dynamic policy game between a regulator and a monopolist. The regulator playing as the leader chooses an emission tax to maximize net social welfare, and the monopolist acting as the follower selects the output and the investment in abatement technology to maximize profits. We find that the optimal tax has two components. The first component is negative and equal to the gap between the marginal revenue and the price caused by the firm market power; the second component is given by the difference between the social and private shadow prices of the pollution stock. Considering a linear-quadratic model we show that if marginal environmental damages are constant, the difference between social and private shadow prices is positive and the optimal policy consists of taxing emissions at a constant rate if the marginal damages are large enough. However, if the marginal environmental damages are increasing the numerical exercises carried out show that this difference is negative at the steady state and the optimal policy gives the firm a subsidy when approaching the steady state regardless of the importance of the environmental damages. This result is explained by the negative

*Corresponding author: Facultad de Ciencias Económicas y Empresariales, Avda. Valle de Esgueva, 6, 47011 Valladolid (Spain). E-mail address: guiomar@eco.uva.es.