

Environmental Regulation under Firms' Strategic Interdependence

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Abstract

In this paper, we consider a polluting oligopoly and examine the effects of market structure and the number of active firms on environmental taxes in a two-stage full-information Cournot oligopoly game. Firms have different production and abatement costs which depend on dirty or clean used technology. Thus, per unit efficient environmental taxes are not the same. In the case of full information, firms' production and abatement cost are common knowledge. We analyze the effects of strategic behavior of firms having market power on optimal pollution taxes. Our goal is to understand the performance of environmental taxes and the influence of the market structure on the efficiency in setting environmental taxes. We will show how the government can optimally set environmental taxes to remedy both environmental problems and the industry production inefficiency problem. To do this, we assume that the regulator maximizes an un-weighted social welfare in a two-period game. In the first stage, the government sets firm-specific environmental taxes, and in the second stage, firms compete as Cournot rivals considering environmental taxes as given.

Keywords: Environmental Regulation, Emissions Taxes, Market Structure, Social Welfare, Mixed Oligopoly.

JEL classification: D60, D82, L13, Q28.