

Environmental Quality Control and Environmental Games

Charles S. Tapiero

e-mail: otapiero@yahoo.com
ESSEC

ABSTRACT

The management and the control of environmental quality involves multiple interested parties, each expressing real and motivated needs. Environmental protection agreements either through preventive and control measures assumed by the parties, regulation by governmental authorities or controls established by polluting firms etc. are at best a compromise. This compromise may be based on the power parties involved have or can exercise or the private information each of the parties has and the potential for monitoring (at a cost) the environmental informational state. In this sense, conflict and information asymmetry combined with the uncertainty associated to policies and their impact on the environment quality (themselves uncertain quantities) and their economic effects, provide both an intellectual and economic-quantitative challenge. For example, environmental "contracts" require in general that the parties invest or produce an effort, each according to the contract terms and their own motivation. When each of the parties is not effortlessly observable, one or both parties may resort to opportunistic behavior, resulting usually in an environmental "disaster".

The purpose of this paper will be to raise in a structured manner a number of issues associated to environmental quality control which recognizes these problems and through specific examples highlight the impact of these factors on the quality of the environment as well as how we might proceed in improving our common lot. Explicitly, this presentation will outline random payoffs environmental games that introduce endogenously environmental monitoring through a pre-mailposterior game. Such a game will generate an endogenous uncertainty that can be met either by sampling or by including compensation for deviant behaviors by the parties. Because of the difficulties in solving these games, the paper suggests that we use risk measures applied in financial analysis such as Value at Risk as well as Volatility at Risk (Tapiero and Vallois, 2002) as criteria of efficiency for solving the environmental games.