

## **PUBLIC ENVIRONMENTAL POLICIES: SOME INSIGHTS FROM ECONOMIC THEORY**

Introduction

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# PUBLIC ENVIRONMENTAL POLICIES: SOME INSIGHTS FROM ECONOMIC THEORY

## Introduction

Alain Ayong le Kama & Thierry Bréchet<sup>1</sup>

In his famous article "Economic prescriptions for environmental problems: how the patient followed the Doctor's orders" (Journal of Economic Perspectives, 1989) Robert W. Hahn showed that public environmental policies had hardly followed the insights provided by the economic theory. In particular, he showed that command-and-control policy instruments were widely used while economic theory suggested that, in some cases, price regulation was more efficient. This point has drawn a large literature after the seminal paper by Weitzman in 1974 "Prices versus quantities". Hahn's question was: why do policy makers favor command-and-control instruments? Another very specific danger he pointed out was the risk that theoreticians stay in their ivory tower instead of confronting themselves (and their theory) to the real world. Let us remind that Adam Smith was traveling across Great Britain when the issue of the coordination of individual decisions and the one of private incentives came up to his mind. In today's world, one can realize that, on the one hand, economic theory is much more specialized and technical than it was at the time of Smith. On the other hand, economic, environmental and social problems have become more and more difficult to assess because they call for transversal and interdisciplinary solutions. These are the two main reasons why the risk mentioned by Hahn is all the more accurate nowadays. Even if they raise deep theoretical problems for economic science, environmental problems are real world problems, and the theoretical environmental economists cannot stand outside from reality. In particular, they cannot ignore the policy dimension of the problems at stake, be they at local or global, static or intergenerational levels.

Since Hahn's paper the situation is quite different, for two reasons. First, theoreticians in economics do pay attention to environmental issues because they raise very specific, exciting, and unanswered theoretical questions. As a consequence, our understanding of the economic dimension of environmental problems has strikingly improved during the last twenty years.<sup>2</sup> Second, because environmental problems do have major impacts on

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2. It is beyond the scope of this special issue to present a whole coverage of environmental economics. The reader interested in scanning the field can refer to the two following handbooks: Mäler and Vincent (2003), Van den Bergh (2002). For a discussion about the EU policy and environmental economics, see also Delbeke et al. (2010).

humankind, there exists a very strong societal demand for understanding and implementing adequate public and private policies. By public and private policies, what we have in mind is centralized solutions (i.e. implemented by some central authority) or decentralized solutions (i.e. implemented by private agents, either alone or under some degree of coordination). Economics has a key role to play in proposing effective and efficient solutions to these decision makers. In this respect, it is striking to contrast what economic theory is able to provide with the solutions implemented in the real world by public and private decision makers. The motivation behind this Special Issue was the feeling that some key insights provided by economic theory remain unused or ill-used by the decision makers. In other words, it seems that economics has much to provide to better manage the environment. We are not claiming that economic theory alone is able to solve all the environmental problems. How to solve a problem (and even the definition of the problem itself) is to a large extent a political question. But once problems are identified, then economics can help solving them efficiently. In fact, there exists a big gap between what economists say and what policy makers do, and there is a need for building some bridges over this gap. Modestly, this is the purpose of this special issue of *Économie internationale*.

In this special issue the reader will be provided with some examples of advanced economic concepts that allow to better understand, and thus to better manage, some major environmental problems. The contributors have been asked to stress the economic and policy implications of their work and to minimize the technical aspects. Interestingly, this issue proposes a range of quite different and complementary methodological approaches.

In the first paper, Laure CABANTOUS, Olivier CHANEL and Jean-Christophe VERGNAUD are interested in the environmental impacts of transportation. Transportation generates many externalities and the authors focus on two of them: greenhouse gases (a global-long term pollutant) and local pollutants (e.g. road congestion, landscape disturbances, road accidents, noise pollution, air pollution). In the search for optimal transport policies, these two kinds of externalities are usually considered separately. In this paper the authors study these pollutants jointly in a sequential decision-making model. The model is a reduced representation of transport economics in which the public decision-maker can control different decision variables in order to regulate polluting emissions. The two-period model takes into account the irreversibility of the policies undertaken, as well as the possibility of a progressive reduction of uncertainties with the arrival of new information. The authors show that structural measures that enable private transport requirements to be reduced are more efficient than technological measures aiming at reducing emissions directly. The authors provide two examples to illustrate the usefulness of a joint analysis of externalities: a tax on car owners, and housing policy.

The market for recycling is the subject of the paper proposed by Jean DE BEIR and Guillaume GIRMENS. This article incorporates the environmental dimension into the analysis of markets characterized by producers of a primary good with some market power over a sector of recycling. In their model, production of the primary good by a monopolistic firm is polluting, whereas production of the recycled good is not. It is shown that taxing the monopolistic

firm allows to reduce pollution, but with a reduction in the total output level. The effect of a subsidy for recycling depends on the slopes of the demand curve and of the recycler's supply curve. So, even if it remains ambiguous in terms of welfare, it is always beneficial for recycling. Put differently, the efficient use of the policy instruments may be uncertain in the case of a monopoly over primary production faced with a competitive fringe of recyclers. This shows why the market structure ought to be taken into account when designing policy instruments.

The third contribution, authored by Jérôme BALLEET, Kouamékan J-M. KOFFI and K. Boniface KOMENA, is devoted to the management of natural resources in developing countries. This paper lies in the field of institutional economics, at the frontier between economics and political sciences, a field that has been honored with the Nobel Prize in 2010. This article analyses the implementation of co-management in developing countries over a twenty-year time period. Using the Institutional Analysis and Development (IAD) framework, the authors highlight the fact that the context in which co-management projects take place significantly influences their effectiveness. In a context of tension between the inertia of developing countries and the pressure exerted by international organizations, it turns out that the dominant model of interaction between central government and local communities is based on rent-seeking. This dominant model does not allow co-management projects to develop under ideal conditions. In the end, this affects their functioning and compromises their effectiveness for the conservation of natural resources. Under these conditions, it appears to be critical to analyze the nature of the partnership between funding organizations and developing countries in order to ensure the effectiveness of the policy.

With the next paper we enter the field of macrodynamics and general equilibrium analysis. Julien CHEVALLIER, Pierre-André JOUVET, Philippe MICHEL and Gilles ROTILLON address the sensitive issue of tradable emission permits allocation rules. With the enter into force in 2005 of the European Emission Trading Scheme (EU-ETS), in which emission permits were given for free to the firms, it appeared to be of a major interest to understand the distributive and efficiency effects of the different possible allocation rules. Because of a strong lobbying, the free allocation of permits to pre-existing polluters with respect to a given benchmark (grandfathering rule) appeared as the best solution for providing an incentive for firms to join EU-ETS. The paper discusses the pros and the cons of alternative allocation rules: emissions per capita, GDP per capita, country's historical responsibility in global emissions, and population size. The main message of the paper is that the most efficient free allocation rule (the one which maximizes world's production level for a given emission cap) is the one that allocates permits on the basis on the level of efficient labor. But a more equitable rule would consist in allocating permits to each production factor proportionally to its share in the production. Then, naturally, the question of the practical implementation of such rules can be raised.

In contrast with the previous paper which was interested in cap-and-trade systems, Mireille CHIROLEU-ASSOULINE and Mouez FODHA claim that price regulation (i.e. a pollution tax) may also be attractive. They also make use of general equilibrium analysis, but in a second-best

setting, and this will be a key element for their results. The two authors analyze the efficiency and equity consequences of the implementation of a tax on carbon dioxide. They raise the question whether these objectives collide or not. By using results from the economic literature they show that some conditions have to be met to reach the three following goals: an increase in the environmental quality, an increase in the economic efficiency, and an improvement in intergenerational equity. Are such theoretical conditions likely to occur? What are the rooms for manoeuvre for an environmental tax reform in the European countries? In all countries, the revenue of the existing environmental taxes is small in comparison with the weight of the labor taxes (which are highly distortionary). By using European data, the authors show that, among all the European countries, Belgium, France and, surprisingly, Sweden, exhibit the less green tax systems and offer the largest opportunities for using the environmental tax revenue as a mean to alleviate the current tax burden on labor.

The last paper of this special issue is about transfers of clean technologies and North-South technological gap. It is proposed by Patrick SCHEMBRI and Olivier PETIT. This paper aims at discussing the main stakes of clean technology transfer between the North and the South in a context of economic globalization and climate change. In the literature, it is commonly argued that developing countries would benefit from being more outward-oriented in terms of both trade and foreign investment. Such a strategy appears as a win-win strategy that would result in an improved environmental quality and substantial revenues for the developing countries. By contrast, the authors argue that such a situation cannot be achieved without considering the critical issue of the potential for environmental innovation in these countries. This paper presents a model of environmental taxation between two asymmetric countries, the North and the South. It shows that there exists a technological gap (between the North and the South) which results from an imperfect absorptive capability of the South. This absorptive capability of the South defines the rate of innovation in clean technologies in this area. This technological gap contributes to explain why the South pollutes more than the North in a non-cooperative game in which the environmental tax rates determine the location of the firms. Finally, cooperation is possible only if a financial transfer between the North and the South is set up. This financial transfer is a measure of the cost of this so-called win-win strategy.

We think that the papers gathered in this special issue of *Économie internationale* will contribute to better understand some environmental problems of today's world. Indeed, they propose effective solutions to the decision makers in the context of a world which is globalized, more and more complex, and difficult to manage. We are grateful to the authors who have provided us with all these important insights from economic theory. By doing so, they have contributed to building the bridge between economic theory and policy makers' needs, which is a prerequisite for efficient and effective environmental policies.

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