



Analysis

The Political Transaction Costs and Uncertainties of Establishing Environmental Rights



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ARTICLE INFO

Article history:

Received 21 April 2014

Received in revised form 15 July 2014

Accepted 1 August 2014

Available online 17 September 2014

JEL classification:

D72

H23

Keywords:

Environmental rights distribution

Political economy

Rent-seeking

Transaction costs

Environmental policy design

ABSTRACT

The significance of transaction costs for the analysis of environmental policy is increasingly recognized. This article focuses on one aspect of the topic: the political uncertainty and transaction costs of establishing environmental rights. Our contribution is to model the political process around the rights establishment, and to monetize the associated welfare costs. The model includes both policy-related and political-institutional parameters, including the extent to which environmental rights are shared with polluters; the environmental benefits of the policy; the policy's abatement costs, and the relative political power of polluters and environmentalists. The model is solved to give unique Nash equilibria for the transaction costs of lobbying, and for the probability of the policy's political success. These results are then used to show the degree to which political actions can dissipate the expected economic surplus from environmental policymaking.

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1. Introduction

Research on the role of transaction costs in environmental policymaking has increased rapidly over the past decade (Garrick et al., 2013a). This subject was recently reviewed and advanced in a special issue in *Ecological Economics*.¹ The emerging view extends neoclassical approaches to include insights from behavioral economics and diverse institutional perspectives. Expositions of this broader analysis can be found in McCann (2013), Garrick et al. (2013b), and Marshall (2013).

This article addresses one issue in the large transaction cost literature: the costs and uncertainties associated with establishing the rights to use resources. This is itself a broad topic. Rights are established through regulatory initiatives to improve health, safety, homeland security, and the environment, and also to improve the management of natural resources, such as water (see Crase et al., 2005, 2013; Garrick et al., 2013b; Grafton et al., 2011; Pease, 2012; Shortle and Horan, 2008). International agreements are also required to define rights over resources that span national boundaries, or which are located in regions outside jurisdictional limits (Libecap, 2014). Within this broad scope, this article

focuses specifically on the assignment of environmental rights through domestic policymaking.

The political actions required to define domestic environmental rights impose significant economic costs, and create uncertainty about the policymaking outcome (Brewer and Libecap, 2009; Buchanan and Vanberg, 1988; Jung et al., 1995; Zetland, 2009, 2011). Yet, traditional economic evaluations – theoretical or applied – do not monetize the welfare costs of establishing environmental rights. This conventional approach implies the logically inconsistent notion that agents are rational before and after the environmental policymaking, while abandoning self interest in the intervening period when the rights are assigned, or that political competition over the rights assignment is expressed only through transfer payments, such as bribes, that have no economic consequence (see Krutilla and Krause, 2011). The latter view is not the standard one in the large public choice literature that studies political behavior and rent-seeking (see Hillman, 2013), although to our knowledge, the public choice literature does not explicitly monetize the welfare costs of assigning environmental rights. Reflecting on the state of the research in water policy and management – a topic that encompasses both environmental and resource policy issues – Garrick et al. (2013b, pp 196) state: “A full treatment of the political economy of transaction costs in water reform is an important future research opportunity.”

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¹ Transaction Costs and Environmental Policy. *Ecological Economics* 88, 1–262, 2013.

In this article, we take up the study of the welfare costs of establishing environmental rights. The distribution of environmental rights is under the control of policymakers, and thus qualifies as a policy parameter. Our goal is to study the way this parameter affects political behavior and welfare costs. Our investigation is in the spirit of a recommendation in McCann (2013) that environmental policy design be considered as an instrument to reduce transaction costs.

To address the study objective, we develop a stylized model of a political contest that draws upon insights from the political economy and rent-seeking literatures, including articles by Becker (1983), Tullock (1980), and Hillman (2013). The model incorporates both policy-related and political-institutional parameters. As noted, the distribution of environmental rights is the principal focus, but the model also includes parameters for the environmental benefits of the policy, the policy's abatement costs, and the relative political power of polluters and environmentalists. Unique Nash equilibria are derived for lobbying costs and for the probability of the policy's political acceptance. Simulations are conducted to show how these variables respond to changes in the parameter values. The solutions are then incorporated into an ex ante normative standard requiring that the expected value of the policymaking be non-negative. This metric monetizes the full welfare costs of the policymaking, including both the political transaction costs of the political contestation, and the economic costs of the associated political uncertainty.

To preview the basic result, political transaction costs can be exceedingly high — as much as ten times higher than the policy's abatement costs for the upper bound parameter configurations considered. For the expected value of environmental policymaking to be non-negative, the required benefit–cost ratio can be remarkably high — greater than 96 for the upper bounds assessed. However, distributing environmental rights to polluters will greatly mitigate these welfare costs. Indeed, distributing all of the rights to polluters will eliminate these welfare costs entirely.

The model that generates these results is structured as a one-shot simultaneous move game over a single policy proposal, abstracting from the possibility of repeated interactions, or political exchanges among stakeholders over a suite of policy reforms. The model also abstracts from some important categories of transaction costs, such as those required for monitoring and enforcement actions, and the transaction costs falling on the public sector. The implications of these and other consequential stylizations will be addressed in the article's concluding section. But it is worth pointing out in advance that our analysis raises questions about the common recommendation in the double-dividend literature to fully auction or tax environmental rights e.g., Goulder et al. (1999). This recommendation follows from modeling in a second-best general equilibrium setting in which environmental policy exacerbates preexisting labor or capital tax distortions. Using environmental rents to finance offsetting tax cuts (while maintaining the size of government) will mitigate these efficiency costs, leading to the recommendation that environmental policy instruments be structured to raise revenue. However, the welfare costs of political behavior are not considered in this analysis. Thus it is possible that the economic cost of political actions over environmental policy alternatives could exceed the efficiency benefits of charging for environmental rights (see Krutilla and Krause, 2011). In fact, this possibility has been shown using a model in which policymaking is assumed to be exogenous, but stakeholders are able to rent seek over the environmental rents that the policy generates (MacKenzie and Ohndorf, 2012). We will return to this issue in our concluding remarks.

In the meantime, the next section reviews some literature on the structure of environmental policy and its effect on political behavior, while the following section describes a simple conceptual framework for environmental rights sharing, and how this parameter will be incorporated into the model. A political economy model is then developed and its solution derived. The solution is used to show the effects of parameter variation on the political feasibility of environmental policy

actions, the associated political transaction costs, and the expected value of environmental policymaking. The final section of the article considers methodology issues and offers some recommendations for future research.

2. Background and Literature

Environmental policymaking legally defines environmental use rights for different stakeholders, and reveals value for these rights either exogenously, by imposing an emissions tax, or endogenously by defining the level of pollution control. This process will cause polluters to reduce emissions, incur abatement costs, and reveal inframarginal rents on residual emissions. The degree of resistance by polluters to this new situation will depend on the degree to which their newly-defined environmental rights entitlement differs from the status quo ante. Polluters view policies that distribute environmental rights to the regulatory authority as an expropriation of their historical property rights — notwithstanding the legal ambiguity of the status quo before the policymaking clarifies it (Bovenberg, 1999; Raymond, 2003). The distribution of environmental rights to the regulatory authority will also impose concentrated financial losses on polluters. As a result, polluters generally oppose policies that require them to pay for the rights to use the environment, such as auctioned tradable permits or emissions taxes, and in fact, would rather be compensated for the losses incurred to forgo their prior use of the environment. These same factors influence the preference of natural resource users over the allocation of use rights (Colby, 2000; Grafton et al., 2011; Pease, 2012).

In contrast to polluters, environmentalists have traditionally been more concerned about the level of pollution control, and its associated benefits, than the disposition of environmental rents. And the revenue benefits of taxing environmental rents are often too diffuse to generate a public constituency in favor of pollution taxation. These perceptual asymmetries have traditionally allowed policymakers to strike a *de facto* bargain with polluters, granting them enough environmental rights to keep most or all of the inframarginal rents, in exchange for pollution reductions. This political economy has favored the use of regulatory standards or emissions trading programs with significant grandfathering of the emissions rights, and also the use of environmental taxes in the role of user charges (to finance pollution control for example), with the rates set too low to deter polluting behavior (see Harrington et al., 2004).

An important line of research has explored whether environmental taxes can be set at high enough levels to deter polluting behavior while sharing enough of the environmental right with polluters to reduce political resistance (see Farrow, 1995, 1999; Pezzey, 1992, 2003). In the first-best context of this literature, inframarginal emissions can be exempted from taxation, or some environmental revenue rebated back to polluters lump sum (hereafter, a “tax-subsidy scheme”) without affecting the marginal incentive effects of the policy instrument. In fact, the efficiency effects of pollution taxes with varying degrees of rights sharing are equivalent to emissions trading approaches with varying degrees of grandfathering. This result effectively extends the invariance property of the Coase theorem to include the distribution of environmental rights using either price or quantity-based policy instruments (when the latter are implemented using tradable permits).

A tax-subsidy scheme in Sweden offers an example of this class of policy designs. It raises taxes on point-source NO_x emissions enough to incentivize polluting firms to reduce them, while rebating collected revenues back to polluters in proportion to their energy use. Less pollution intensive firms than the industry average receive a subsidy on net, while the others pay a tax — but one that is less than the standard emissions charge. This policy has significantly reduced NO_x pollution in Sweden (see Sterner and Isaksson, 2006). Buybacks of fishing quotas in New Zealand and water rights in Australia exemplify similar compensation schemes in the resource management context (see Colby, 2000; Crase et al., 2013; Garrick et al., 2013b).

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