



Economic ideas for a complex climate policy regime

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ABSTRACT

The parsimony of economic theory provides general insights into an otherwise complex world. However, the most straightforward organizing principles from theory have not often taken hold in environmental policy or in the decentralized climate policy regime that is unfolding. One reason is inadequate recognition of a variety of institutions. This paper addresses three ways that the standard model may inadequately anticipate the role of institutions in the actual implementation of climate policy, with a U.S. focus: multilayered authority across jurisdictions, the impressionistic rather than deterministic influence of prices through subsidiary jurisdictions, and the complementary role of prices and regulation in this context. The economic approach is built on the premise that incentives affect behavior. We suggest that an important pathway of influence for economic theory is to infuse incentive-based thinking into the conventional regulatory framework. In a complex policy regime, incentives can be shaped by shadow prices as well as market prices.

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1. Introduction

An idea at the core of microeconomics is that incentives affect behavior and thereby ultimately affect material outcomes. In shaping environmental policies, for a variety of practical reasons economic ideas suggest that targeting incentives is expected to be more cost-effective than prescribing mandates. The preferred approach to influencing incentives is to introduce prices on environmental services. It is almost axiomatic as policy advice to simply get the prices right; that is, to set prices equal to social marginal cost. If policy makers can accomplish that, socially desirable behavior is expected to follow.

In contrast, prescriptive regulation is subject to criticism because it creates incentives that do not necessarily align with the policy goal and often evoke unintended consequences. A familiar example is the influence of a performance standard for new emissions sources, a common policy with respect to both mobile sources and stationary sources, which may have the unintended effect of increasing emissions in the short run, the opposite of the regulation's intent. To remedy this problem while using

prescriptive policy requires layers of additional fixes and associated new challenges.²

Compared to the unintended consequences and complexities of regulation, setting prices to equal the social cost of environmental damages appears simple. Since Pigou (1920), this economic idea has made a large intellectual contribution, yet it has rarely been adopted in environmental policy. One reason that is sometimes offered for the limited influence of environmental prices in environmental policy is the multitude of market failures that prevent a single price from solving the problem (Hepburn, 2010).

This paper argues that another reason for limited influence is the failure to anticipate the institutional context in which economic ideas

² A standard on new sources is intended to ratchet up the average environmental performance over time as relatively clean new sources replace dirty older sources. However, an emissions standard raises the cost of new sources and thereby creates an incentive to extend the life of older ones. As a consequence, a new source performance standard might actually cause a delay in new investment (Gruenspecht, 1982; Nelson et al., 1993) and increase emissions compared with the no-policy baseline, at least in the short run (Maloney and Brady, 1988; Evans et al., 2008; Patino Echeverri et al., 2013). This unintended consequence results from the imperfect or indirect alignment of incentives created by the prescriptive regulation with the ultimate policy goal. To remedy these problems a regulator might institute a provision requiring upgrades of older facilities at a specific age. However, the regulator is not assured of the age at which it is cost-effective to upgrade an older facility. In fact, that age may vary across facilities, and a facility manager may have an incentive to hide its true costs and opportunities to avoid additional investments.

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will take shape. We use the term institutions broadly to describe the set of laws, rules, organizations and relationships that pre-exist a policy intervention; that is, features of the empirical context of a policy problem. Institutions often introduce friction in the transmittal of incentives because they impose constraints and costs on changes to behavior. Barbier (2011) offers a transactions cost perspective to describe the intransigence of institutions themselves to change. Vested economic interest in the status quo helps to explain *institutional inertia* and reluctance to change. In any context, a change in the rules will create losers who will act to obstruct such a change, and we invoke this explanation at some points.³ However, we have a more general case in mind where institutions may have strong justifications as solutions to historic problems and serve as watchtowers that protect the precedents of values of previous social decisions. By design or evolution, they affect how change will occur.

The influence of institutions that we review is threefold. The first is the political context of policymaking, which not only influences its design but also its timing, an important aspect of which is the ability and authority to update policy in response to new information. Because the climate problem will span several decades, policy responses have to find a way to be durable yet flexible and able to assimilate new information. Various approaches to price-based policies and other types of regulation are typically implemented with different characteristics in this regard. A second is the multiple layers of regulatory authority that exist across different levels of governmental jurisdiction. The separation of authority and information across jurisdictions creates problems analogous to those between principals and agents in market contexts. A third institutional relationship that follows is the ability of prices to affect all the relevant margins of economic behavior that influence environmental outcomes especially those relating to infrastructure investment, which is especially important in the context of climate policy.

Viewed from within the economic paradigm, the advice to get the prices right is straightforward. Sometimes this advice is translated verbatim as a recommendation for social policy with the expectation that it would be sufficient to enable efficient outcomes.⁴ However, the performance of prices as a coordinating mechanism for social activity hinges on the successful transmittal of price signals and the unconstrained ability of decision makers to respond, which we argue is not guaranteed. Institutions can undermine the effectiveness of a simple price-based approach to environmental policy, which helps explain its limited penetration in policy. We describe important ways in which conventional economic tools may not work as expected in addressing emissions stemming from large industrial sources to local land use decisions.

The next section of the paper considers how the existence of a political environment shapes the performance of various policy instruments; the primary political context we consider is the United States. We find the grand policy experiment of emissions trading for sulfur dioxide (SO₂), a flagship policy for the use of economic instruments in environmental policy, has produced less emissions reductions than have other measures pursued under the regulatory authority of the Environmental Protection Agency (EPA) over the same time frame. Looking forward, we predict that greater permanent carbon dioxide (CO₂) emissions reductions will be achieved in the U.S. by 2020 under what we describe as the Clean Air Act regime than if the proposed Waxman-Markey legislation enacting cap and trade had passed.⁵ These examples illustrate

³ An example outside the U.S. context is presented by Del Rio and Labandeira (2009), who examine Spanish climate policy and find that existing non-market policies are favorable to several large and highly visible interest groups. Because voters do not prioritize global climate change, replacing the status quo with market-based climate policy would be difficult and met with confrontation. Similarly, Pearce (2006) discusses the political economy of the United Kingdom's climate change levy, which is far from a textbook carbon tax due to political considerations.

⁴ This view is summarized by Nordhaus (2006): "To a first approximation, raising the price of carbon is a necessary and sufficient step with tackling global warming." In contrast Hanemann (2010) argues that a price on carbon is necessary, but will need to be accompanied by complementary regulatory measures.

⁵ We emphasize below that globally emissions may be lower under cap and trade due to offsets.

that the performance of economic instruments in an institutional context can differ over time from what is anticipated in theory.

Section 3 examines policies enacted at different jurisdictional levels and how they might interact. Section 4 considers how well policy at the national level may transmit incentives through other jurisdictional levels to influence decisions within their institutional domain.

We conclude with the assertion that the imagined performance of economic ideas within an institutional setting is not guaranteed to match theory. In much of the discussion about climate policy, as well as in the teaching of economics, a dichotomy is presented posing market-based policies versus regulation. This dichotomy suggests that policymakers should dismantle regulatory institutions and replace them with markets. We argue that in most cases this suggestion is implausible and in any event not helpful. Moreover, it undermines the contribution that economic ideas can make. We suggest that economic ideas can have their greatest influence not through the substitution of purportedly simple market functions for complex institutions, but by influencing the way those institutions function. Sometimes this approach will involve the introduction of market prices, but many times it will involve the introduction of regulatory reforms and shadow prices that align incentives under various rules and constraints with policy goals. After all, prices serve as a vehicle to deliver incentives, but incentives are the core of the economic approach to shaping behavior.

Economic ideas can increase their influence on environmental outcomes by influencing existing institutions to move toward the greater use of incentives in place of prescriptive regulations. This possibility is anticipated in President Obama's June 2013 memorandum that directed EPA "...to ensure, to the greatest extent possible, that you develop approaches that allow the use of market-based instruments, performance standards, and other regulatory flexibilities."⁶ This approach promises to improve the cost-effectiveness of regulations in the near term. Over time, one can hope for an expanding role for market-based prices, which has the added promise of achieving greater efficiency in the allocation of resources across sectors.

2. Political context of policymaking

Policies are the products of the political context through which they are created and enacted. One example is the way the political context shapes how the policy can be changed over time. Economic ideas suggest that policies should be updated over time to assimilate new information.

2.1. The experience of sulfur dioxide emissions trading

Prior to the EU's CO₂ Emissions Trading System, the flagship example of the economic approach to environmental regulation was the U.S. Acid Rain Program, which instituted cap and trade for SO₂ emissions. The program is a successful example of cost-effective implementation of environmental regulation (Carlson et al., 2000; Ellenman et al., 2000). However, an ex post perspective of its overall economic performance yields an ambiguous evaluation.

In 1990 the National Acid Precipitation Program forecast that SO₂ emissions would be about 16 million tons in 2010 from sources that were to be regulated under the cap. The emissions cap was to reduce emissions to 8.95 million tons. At the time that the trading program was adopted, the cap was thought to approximately balance marginal benefits and costs (Portney, 1990), but soon thereafter subsequent economic analysis estimated marginal benefits to be about 30 times greater than marginal costs (Burtraw et al., 1998; Chestnut and Mills, 2005). The efficient level of the cap was subsequently identified to be about 1 million tons per year (Banzhaf et al., 2004; Muller

⁶ <http://www.whitehouse.gov/the-press-office/2013/06/25/presidential-memorandum-power-sector-carbon-pollution-standards>.

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