



Democracy, inequality and the environment when citizens can mitigate health consequences of pollution privately or act collectively



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ABSTRACT

We study the political economy of the environment in autocratic, weak and strong democracies when individuals can mitigate the health consequences of domestic pollution privately as well as control pollution collectively through public policies. We consider a small open economy with comparative advantage in dirty goods. With costly private mitigation, income inequality leads to an unequal distribution of the burdens of pollution (in accordance with the evidence). We show that the eco-friendliness ranking of political regime types varies with the cost of private mitigation and that increased inequality has non-monotonous effects on equilibrium pollution levels. In weak democracies, the political equilibrium may be characterized by low environmental standards but highly restricted trade, thus leading to ambiguous outcomes regarding pollution levels.

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1. Introduction

It is well documented that poorer individuals tend to suffer more from the adverse effects of domestic pollution.¹ This fact indicates that although private measures to mitigate the consequences for health of pollution do exist, including bottled water, filtration, air purifiers, medicines and house location among other methods, their cost prevents universal adoption.

While private mitigation of the consequences of pollution has been examined to some extent in an economic context,² its role has been largely neglected in the political economy literature.³ In this paper, we explore the nature of environmental regulation in

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¹ See Ash and Fetter (2004), Pearce et al. (2006), Brooks and Sethi (1997), Neidell (2004), Jayachandran (2008) and Evans and Smith (2005) and the reviews of Brunekreef and Holgate (2002) and O'Neill et al. (2003).

² See, for instance, Coase (1960), Shibata and Winrich (1983), McKittrick and Collinge (2002), Neidell (2009), Hanna (2007), and Rosado et al. (2006).

³ Banzhaf and Walsh (2008) shows that people move to improve environmental quality, which can be considered an earlier step in the context of the Tiebout class of political economy models. Also, although the work of Aidt et al. (2010) showing that British municipalities in the 1870 s with a limited voting franchise invested more in sanitation control than did municipalities with a more extensive voting franchise, is not explained with reference to the cost of private mitigation, it could be interpreted in those terms.

autocratic, weak and strong democracies when individuals may mitigate the health consequences of domestic pollution privately, as well as act collectively via public policy actions of different kinds. The economic setting is that of a small open economy in which domestic incomes depend importantly on the export of dirty goods. Many countries are small and open and in these cases we agree with others that the determination of environmental regulation is bound up with the choice of trade openness.⁴

The recognition that the health consequences of local pollution can be dealt with privately at a cost as a substitute for collective action adds an important dimension to the analysis of the political economy of the environment and yet, it has received little attention. To our knowledge, [Hotte and Winer \(2012\)](#) is the only existing paper that proposes a full-fledged model. It argues that when private mitigation of the consequences of pollution is feasible, income inequality leads to an unequal distribution of the burden of pollution in accordance with the evidence, thus polarizing the interests of citizens.⁵ With the use of a Ricardian model of trade with full specialization, they show that free trade may further polarize interests concerning environmental regulation. Many issues, however, remain to be explored in this context.

Here we extend the analysis by introducing the following additional refinements and their interactions: we consider (i) a wider range of political regime types differentiated by the manner in which political influence is exerted by groups of different income levels; (ii) a trade tariff with partial specialization to be interacted with environmental regulation as an additional policy instrument; and (iii) changes in the distribution of incomes. The important role played by such factors in explaining the provision of various public goods has recently been highlighted by this journal. For instance, in their analysis of country-level decisions to limit emissions of greenhouse gases – a global public good – [Buob and Stephan \(2011\)](#) underscore the important role played by measures to attenuate the effects of global warming at the country level. [Justesen \(2012\)](#), in an analysis of the supply of public policies relating to the treatment of HIV/AIDS, argues that one should differentiate not only between autocratic and democratic governments, but also between types of democratic regimes. And finally, [Markussen \(2011\)](#) shows that income inequality has ambiguous effects on the provision of public goods. Here, those factors are considered simultaneously to yield new insights.

Three types of regimes are compared. The first is an autocratic one where only a rich elite determines what actions the government undertakes. In the second regime, referred to as strongly democratic, the selection of a policy combination responds to political voice exercised by all citizens but with varying influence. The third, which we refer to as weak democracy, is a regime where the elite fully controls one policy dimension, while elected governments have power only with respect to the other; we consider a case where the elite sets environmental regulation while the trade tariff is left to the government.

Comparative analysis highlights the roles of the cost of private mitigation and of income inequality in shaping the nature of political equilibria. When the cost of private mitigation is high, autocracies and strong democracies adopt the same set of policies, despite the fact that the rich elites bear a larger share of the resulting drop in national income. This stands in contrast to [Congleton \(1992\)](#) who pioneered the study of the relationship between regime type and environmental control, and who argues that rich elites in autocratic regimes prefer less regulation.⁶ At intermediate cost levels – that is, when only the rich can afford private mitigation – an increase in the influence of lower income citizens in strong democracies leads to the adoption of stricter environmental controls. However, in this intermediate case we also show that the multi-dimensionality of the policy space in elections leads to indeterminacies regarding environmental outcomes when comparing weak and strong democracies. (More about this below). And when the cost of private mitigation is low, so that everyone can protect themselves privately to some extent, we show that a fully democratic regime may adopt laxer environmental policies than an autocratic one because once protected, the willingness to pay of poorer citizens for a cleaner environment is reduced.

In the course of the comparative analysis, we see that higher individual incomes (e.g., in rich democracies) are not always associated with greater demands for a cleaner environment in an equilibrium, the usual normal good prediction, a result that concurs with micro-based evidence provided by [Kahn and Matsusaka \(1997\)](#) and [Kristrom and Riera \(1996\)](#) showing that demands for environmental regulation can be lower among higher-income individuals in some communities.⁷ In this respect, it is important to keep in mind that demand for a cleaner environment is not the same as a demand for better health, and there tends to be a disconnection between the two when private mitigation technologies are available.

Concerning income inequality, we identify conditions under which greater inequality leads to a reordering of regime types in terms of their equilibrium pollution levels. When rich and poor choose to mitigate equally, as is more likely to occur when income inequality is low, the rich prefer relatively more pollution control: we then see that an autocracy can lead to lower pollution levels than in a strong democracy. But when private mitigation is a luxury that only the rich can afford, in societies with high income inequality, then the rich prefer higher pollution levels than do the poor. Autocracy in this case leads to more pollution than does full democratic choice.

The multi-dimensionality of the policy space creates interesting ambiguities in the comparative analysis we present. Multi-dimensionality introduces the possibility of ranking the eco-friendliness of regimes either by the stringency of direct environmental regulation, or by control of specialization in the production of dirty goods. The nice study by [Damania et al. \(2003\)](#),

⁴ See, for example, [Pethig \(1976\)](#), [Hillman and Ursprung \(1992\)](#), [Copeland and Taylor \(1994\)](#), [Chichilnisky \(1994\)](#), [Schleich \(1999\)](#), [Schulze and Ursprung \(2001\)](#), [Copeland and Taylor \(2003\)](#), [McAusland \(2003\)](#) and [Damania et al. \(2004\)](#). None of these studies considers the role of private mitigation.

⁵ [Eriksson and Persson \(2003\)](#) rely on the fact that higher income individuals may be less affected by pollution but the choice of defensive actions and trade openness are not part of their analysis.

⁶ Congleton's framework does not explicitly allow for private mitigation. Other political economy work that does not consider private mitigation, and which as a whole points to a complex relationship between political institutions and the environment includes [Murdoch et al. \(1997\)](#), [Fredriksson et al. \(2005\)](#), [Farzin and Bond \(2006\)](#), [Dasgupta et al. \(2006\)](#) and [Fredriksson and Wollscheid \(2007\)](#).

⁷ Other recent empirical work indicates that the effect of average income on environmental regulation may actually turn negative once one controls for the level of democracy. See [Torrás and Boyce \(1998\)](#), as well as [Fredriksson et al.](#), [Farzin and Bond](#), and [Dasgupta et al.](#) cited above.

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