



Environmental regulation and trade openness in the presence of private mitigation[☆]

Louis Hotte^{a,*}, Stanley L. Winer^{a,b,*}

^a Department of Economics, University of Ottawa, Canada

^b School of Public Policy and Administration and Department of Economics, Carleton University, CESifo and ICER, Canada

ARTICLE INFO

Article history:

Received 23 March 2009

Received in revised form 10 January 2011

Accepted 17 January 2011

JEL classification:

D7

F18

Q56

Keywords:

Environmental regulation

Pollution

Private mitigation

Defensive measures

Avoidance activities

Health

Trade

Dirty goods

Individual welfare

Democracy

Representation theorem

Autocracy

ABSTRACT

Acknowledging the differential ability of individuals to privately mitigate the consequences of domestic pollution for their health is essential for an understanding of their demands for regulation of the environment and of trade in dirty goods, and for analysis of the implications of these demands for equilibrium policy choices. In a small open economy with exogenous policy, we first explain how private mitigation at a cost results in an unequal distribution of the health consequences of pollution in a manner consistent with epidemiologic studies, and consequently how the benefits and costs of trade in dirty goods interact with choices concerning private mitigation to further polarize the interests of citizens concerning environmental stringency. The economy is then embedded in a broader political economy setting, and simulated to investigate the role of private mitigation in shaping political equilibria. We show that when citizens can choose between mitigating the health consequences of domestic pollution privately and reducing pollution through public policy, the same polarization of interests underlies equilibrium policy choices in both democratic and autocratic regimes.

© 2011 Elsevier B.V. All rights reserved.

1. Introduction

In this paper we analyze the demands by individuals of varying incomes for regulation of the environment and of trade, and the implications of these demands for equilibrium public policy choices. The economic setting is that of a small open economy producing two tradable goods, one of which is polluting, where more stringent environmental control reduces income. The differential ability of individuals to privately mitigate the consequences of domestic

pollution for their health at a cost is a key characteristic of the analysis throughout.¹

News stories about how the poorest within developing countries are most affected by domestic pollution are legion.² In fact, many epidemiologic studies confirm that those with lower socioeconomic status tend to suffer a heavier health burden from pollution. (See Jayachandran, 2008; Pearce et al., 2006; Evans and Smith, 2005; Brunekreef and Holgate, 2002; Neidell, 2004; Brooks and Sethi, 1997 among others). We might therefore expect that within a country, individual demands for environmental regulation will be more intense among lower income groups, as the evidence provided by Kahn and Matsusaka (1997) and Kristrom and Riera (1996) appears to

[☆] We thank Sophie Bernard, Cinzia Di Novi, Ruth Forsdyke, Michael Kevane, Bryan Paterson, Stéphane Straub, an anonymous referee and the editor for helpful comments. We also thank seminar participants at CERDI-Université d'Auvergne, Université Paris 1 Pantheon-Sorbonne, the University of Ottawa, Université de Rouen, the University of Western Ontario, the University of Eastern Piedmont, Georgia State University, Hohenheim University and participants in meetings of the CSAE, the CEA, CREE and the IIPF, as well as the Montréal Natural Resources and Environmental Economics Workshop. Winer's research was partly supported by the Canada Research Chair Program. This work was also supported by a research grant from the SSHRCC.

* Corresponding author. Tel.: +16135625800x1692, fax: +16135625999.

E-mail addresses: louis.hotte@uottawa.ca (L. Hotte), stan_winer@carleton.ca (S.L. Winer).

¹ In accordance with the related literature, we define *private mitigation* as measures that attenuate the adverse consequences of given pollution levels for a person's health. The expressions *avoidance*, *averting* and *defensive* measures are similarly used. More recently and in the context of climate change, the term *adaptation* is being used, though with a more general application.

² See Bernard, 2006; Bradsher and Barbosa, 2006; French, 2005 or The Economist, 2005.

confirm. Similarly, when a country's comparative advantage lies with the production of goods that are pollution intensive, we might expect opposition to trade openness among lower income citizens to be relatively stronger.

On the other hand, it is often argued that environmental quality is a normal good – that richer individuals are willing to pay more for a cleaner environment. If that is the case, then poorer people will demand laxer environmental regulation and more trade with specialization in dirty production than will the rich. Such is the basic reasoning behind Summers' provocative 1991 memo at the IMF, which put forward the idea that it may make sense for dirty industries to move South.³

There are good reasons to believe that environmental quality is a normal good in many contexts. But in the light of the epidemiologic studies, that this means that poorer individuals *always* demand less stringent environmental regulation and more open trade in domestically produced dirty goods does not seem sensible. Indeed, another straightforward application of the normal good argument also leads one to infer that wealthier individuals in developed countries always demand more restricted trade in polluting goods than do the poor.

In this paper we regard these contrasting views as special cases that may arise within a more general framework of analysis. We begin with the idea that it is not environmental quality per se which is a normal good, but rather it is the health condition associated with it. And once this consideration is combined with the fact that the impact of pollution on health can be privately mitigated at a cost,⁴ there are far-reaching implications for our understanding of the relationships between environmental regulation, trade openness and individual interests, including reconciliation of the views above.

To expose and explore these implications, we consider a small open economy with Ricardian production technology in which individuals differ by income levels, along with its autarkic counterpart. The model is simplified so that closed-form derivation and comparison of economic equilibria are possible. Here the choice between trade with specialization in the polluting good versus autarky serves as a simplified policy option regarding the regulation of trade openness. This economic model (where policies are exogenously determined) allows for closed form inter-personal comparisons of the impact of environmental regulation even when pollution control interacts with the benefits of trade openness.⁵ The economy is then embedded in a broader political economy setting, and simulated to further investigate the role of private mitigation in the determination of public policy choices.

We show at the outset that the availability of private mitigation results in an unequal distribution of the health consequences of pollution across income groups in a manner consistent with

epidemiologic studies. This stands in contrast to the related literature, where the effects of pollution are uniformly born across the population. (See Fredriksson, 1997; Aidt, 1998; Schleich, 1999; McAusland, 2003; Copeland and Taylor, 2003). Exceptions to the equal burden assumption include Copeland and Taylor (2003; §7.3), where it is assumed that people's tastes about the environment differ exogenously and without relation to income. To the best of our knowledge, Eriksson and Persson (2003) provide the only study in which the negative effects of pollution decline with income. However, while the extent to which the adverse consequences of pollution are privately attenuated is explicitly modeled in our paper, these authors assume that the distribution of the burden of pollution is exogenously determined, and they do not consider trade.

Costly private mitigation leads to the polarization of the interests of rich and poor with respect to the stringency of regulation, in a manner that we investigate in detail. The interaction of individual decisions about private mitigation with the consequences of trade openness exacerbates this divergence. We also show that when trade leads to a more polluted environment compared to autarky, the demands for public action to control pollution by high-income individuals may decrease. This is because the additional income that trade generates allows the rich to better insulate themselves from the health consequences of pollution. Moreover, since the gains from trade may be weaker for lower income individuals, trade in dirty goods may lead to a strengthening of the poor's demand for environmental regulation. In such situations, a simple normal-good-based prediction about pollution will not always serve as an accurate guide to the nature of individual interests in the open economy.

It is reasonable to expect that this polarization of interests will carry with it implications for the outcome of political competition. The reason is that introducing private mitigation possibilities alters individual incentives to seek costly collective as opposed to costly private actions as a way of dealing with environmental degradation. To study the role of private mitigation in a political context, we simulate the equilibrium relationship between environmental regulation, trade and welfare for two income groups in fully democratic and in autocratic regimes differentiated by the presence or absence of political voice for poorer citizens. The economic structure analyzed in the first parts of the paper is embedded in the model used, and the role of private mitigation is studied by varying its effective cost.

We show that the costliness of private mitigation or, equivalently, the nature of the pollutant, is a key factor underlying the equilibrium choice of policy towards the environment and towards trade. When private mitigation is infeasible, fully democratic and autocratic regimes in which the poor have no voice tend to adopt the same levels of regulation and of trade openness. But with costly private mitigation, the interests of the mass of poorer voters in dealing publicly with environmental degradation diverge from those of the rich, and the outcome in the fully democratic setting involves more regulation than in an autocracy. In this way we see that the importance of the interaction of individual choices about private mitigation and trade openness uncovered in the economic model with exogenous policy carries over to the equilibrium policy context.

Other authors – for example, Congleton (1992) and Winslow (2005) – argue that democracy is good for the environment because elites have a greater share of any income generated by the production of dirty goods, as they do in the model developed here. Here we show why not just inequality, but also the presence of costly private mitigation must be acknowledged in the political economy of environmental policy.

In the broader political economy context, we also suggest how cases may even arise where the poor may oppose trade openness in a democracy even though it has the potential to benefit everyone, because of a concern that laxer environmental regulation with trade will then be imposed in the interests of richer citizens. Such

³ In the theoretical literature, Copeland and Taylor (1994) show that if the normal-good argument is accepted, then a representative individual in a poor country optimally chooses lower environmental standards and thus favors specialization in dirtier industries. The other key assumption here is that all externalities are somehow internalized. If that is not the case, and at the other end of this normative literature, are the analyses of Pethig (1976) and Chichilnisky (1994) who take as given that environment standards are lower in developing countries, and argue that although these countries attract dirtier industries, one cannot be sure that trade does not lower welfare; it depends on what drives the choice of standards. On trade and endogenous internalization, see Hotte et al. (2000) and Copeland (2005). Finally, we note that while this normative literature informs our work, our concern is with positive aspects of how individual interests are shaped and the role such demands play in shaping equilibrium policy outcomes.

⁴ For analysis of consumer behavior in the presence of private mitigation, see Courant and Porter (1981), Shibata and Winrich (1983), Bartik (1988) and McKittrick and Collinge (2002).

⁵ The same qualitative effects would be present with the more general Heckscher–Ohlin framework, but this would come at a cost in terms of insight and clarity. One should also note that, as Feenstra (2004) points out, “... the Ricardian model is as relevant today as it has always been” (p. 1).

متن کامل مقاله

دریافت فوری ←

ISIArticles

مرجع مقالات تخصصی ایران

- ✓ امکان دانلود نسخه تمام متن مقالات انگلیسی
- ✓ امکان دانلود نسخه ترجمه شده مقالات
- ✓ پذیرش سفارش ترجمه تخصصی
- ✓ امکان جستجو در آرشیو جامعی از صدها موضوع و هزاران مقاله
- ✓ امکان دانلود رایگان ۲ صفحه اول هر مقاله
- ✓ امکان پرداخت اینترنتی با کلیه کارت های عضو شتاب
- ✓ دانلود فوری مقاله پس از پرداخت آنلاین
- ✓ پشتیبانی کامل خرید با بهره مندی از سیستم هوشمند رهگیری سفارشات