



Regulation versus taxation[☆]

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ABSTRACT

We study which policy tool and at what level a majority chooses in order to reduce activities with negative externalities. We consider three instruments: a rule, that sets an upper limit to the activity which produces the negative externality, a quota that forces a proportional reduction of the activity, and a proportional tax on it. For all instruments the majority chooses levels which are too restrictive when the activity is performed mainly by a small fraction of the population, and when costs for reducing activities or paying taxes are sufficiently convex. Also a majority may prefer an instrument different than what a social planner would choose; for instance a rule when the social planner would choose a tax.

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1. Introduction

Three ways of reducing the level of an activity generating negative externalities are routinely used: a rule that sets an upper bound to this activity, a proportional tax on it, a compulsory proportional reduction of the activity for everybody.¹ This paper investigates which policy and at what level would be chosen by majority voting. The latter does not deliver the optimal policy choice for two reasons. First, for given policy instrument, majority voting does not yield the optimal level of it. Second, and perhaps more interestingly, when choosing among alternative instruments, majority voting in general does not lead to the choice of the optimal one. For instance, the majority may choose a rule instead of a proportional tax because a rule concentrates on the minority the burden of the reduction of the activity which generates negative externalities. A social planner would instead choose a tax and, if he were constrained to

choose a rule, he would choose one which was more permissive than the one chosen by the majority. We thus have a “double distortion” caused by voting. This case arises when those who generate a negative externality are a minority. The opposite double distortion occurs when the activity with negative externality is enjoyed by many. In this case a social planner may choose a restrictive rule, while a majority may choose a lenient tax.

These insights are consistent with the evidence that in many cases we observe regulation while the optimal policy would be taxation, or vice versa. For example, in agriculture the limits in the use of pesticides are quite frequent whereas taxes on them are less common. In the case of air pollution, there is a sharp contrast between the use of taxes and the use of emission standards. The latter are preferred when polluters are concentrated in specific industries or plants, such as emissions of pollutants by power generation industries or by steel and cement makers.² Anti smoking regulations became very strict as the number of smokers declined. We see low levels of taxation when the polluters

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¹ A fourth way of curbing negative externalities are tradeable permits. We do not study them in the present paper, but we briefly discuss them in the Conclusion.

² On November 22, 2010 the Wall Street Journal reported that since Mr. Obama took office, the US Environment Protection Agency (EPA) had proposed or finalized 29 major regulations and 172 major policy rules. Requiring energy sources to install the best available control technology to limit greenhouse gas emissions, would impose the electric industry costly capital expenditures to meet the increasingly strict burden.

are the majority; for instance low taxes on gasoline in the US or on heating fuel.³

Policy makers may choose quotas when tax collection is costly or simply impossible, or because they are perceived as a fair method of sharing the sacrifices of curbing externalities (e.g. international agreements, like the Kyoto protocol, or in many cases in the European Union).

We label our negative externality “pollution” for brevity. However our discussion of instrument choice applies to many other policy issues, which may include construction rules, speed limits, rules of behavior in communities like condominiums, prohibition (or very strict regulation) of certain activities, from gambling to selling of organs, to prostitution to free acquisition of guns and many others. [Masciandaro and Passarelli \(2013\)](#) apply the model of the present paper to discuss issues of financial regulation. Thus we believe that our model is sufficiently general to be applied to a variety of different cases. In some of those, the externality has the straightforward interpretation of monetary costs inflicted on others. In other cases, it may take the form of a negative “utility cost” inflicted on others, who engage in certain activities which they find objectionable, like gambling or prostitution. [Baron \(2003\)](#) claims that “moralistic” goals regarding how others should behave are prominent in how people vote. [Roth \(2007\)](#) in his discussion of organ exchanges argues that repugnance of certain transactions related to trades in organs, implies relevant social costs.

This is why we feel that it is appropriate to use a majority rule voting model. Much of the literature on “pollution” strictly defined adopts lobbying models, as discussed in the next section. While lobbying pressures are clearly important, especially for legislation which affects one particular sector, clearly decisions regarding the list of activities mentioned above, from smoking to gun control etc., involve voting in legislatures or even in private associations, e.g. owners' associations. Our contribution is on the voting aspect of the issue at hand, future research could merge the two approaches, lobbying and majority voting.⁴ Take, for instance, smoking regulations. Clearly the decision regarding smoking age, taxation over cigarettes etc., is influenced by the lobby of the tobacco industry. But the fraction of individuals smoking will also influence the legislative choice regarding regulation and taxation of smoking. The same applies to gun control: the gun lobby is strong but different states in the US have different regulations as a function of the preferences of the voters.⁵

We should make clear from the outset that we consider only proportional taxes on the polluting activities. By allowing any type of curvature on the tax schedule, including corners, one could reproduce patterns which approximate a rule, and are quite far from the allocation generated by a proportional tax. In a “positive” politico economic model we need to worry about the existence of a Condorcet winner. While we can prove its existence with a proportional tax, in general one cannot do that with any curvature of the tax schedule. Thus all of our positive results would be interpreted as comparing rules and quotas versus a proportional tax on the polluting activities. Realistically speaking these are the kinds of policies routinely discussed in this area. We briefly return to this issue in the [Conclusion](#).

The present paper is organized as follows. In [Section 2](#) we review the relevant literature. In [Section 3](#) we set up the basic model of the activity which produces negative externalities. Then we study the majority vote equilibrium when the policy instrument is a rule ([Section 4](#)) a quota ([Section 5](#)) and a tax ([Section 6](#)). In [Section 7](#) we study the choice of

the policy instrument by majority voting. [Section 8](#) concludes and illustrates several extensions of the model. All the proofs are in [Appendix](#).

2. Review of the literature

The dilemma between regulation and taxation is old in the literature, but it has been traditionally posed in a normative context. The idea that the two instruments perform differently when uncertainty regards either costs or benefits dates back to [Weitzman \(1974\)](#).

The literature which introduces political economy considerations in this area is confined to environmental issues.⁶ [Buchanan and Tullock \(1975\)](#) compare environmental taxes with a proportional reduction of polluting activities, which they define “regulation”. There is no voting stage or any specification of the political process in their work. They offer several arguments in favor of taxes, but they claim that people are more likely to prefer proportional reductions. [Congleton \(1992\)](#) focuses on how political institutions affect the enactment of environmental regulations. [Schneider and Volkert \(1999\)](#) claim that differentiated interests between voters, politicians, interest groups and bureaucrats may lead to suboptimal instrument choice or to inefficient implementation.

We share an interest in the connection between redistributive policies and regulation with [Coate and Morris \(1995\)](#), who claim that inefficient environmental policies are frequently adopted as redistribution schemes even when more efficient redistribution instruments are available. [Fredriksson and Sterner \(2005\)](#) argue that “clean” firms may, somehow surprisingly, according to their analysis, lobby in favor of higher taxes in order to benefit from larger refunds. Our majority voting model yields a similar result when the polluters are a minority in the society. In fact this result is not surprising in a voting model.

[Cremer et al. \(2004\)](#) study the efficiency of majority voting on an environmental tax when the proceeds of the latter are used to reduce income and capital taxes. If labor and capital taxes are rebated in the same proportion, the majority chooses an environmental tax which is too low.⁷ [MacKenzie and Ohndorf \(2012\)](#) argue that the distributional conflict is harsher with revenue-rising instruments (e.g. ecotaxes or tradeable-permit auctions) than with non-revenue-raising instruments. In [Kawahara \(2011\)](#) voters cannot observe the type of politicians and the environmental damage. In a pooling equilibrium, pro-industry politicians implement too low taxes in order to please polluters; in a separating equilibrium pro-environmental politicians choose too high the tax in order to signal their stand. [Aidt \(2010\)](#) argues that when income taxation is highly distortionary and the political environment is highly competitive, the polluter group lobbies in favor of refunding all ecotax revenues to citizens–voters.

A related strand of the environmental policy literature studies the instrument choice.⁸ We share with this literature the idea that, whenever regulation and taxes are available policy options, majorities may prefer regulation to taxes even when the latter would be socially optimal (cf. [Keohane et al., 1998](#)). [Dijkstra \(1998\)](#) claims that in the presence of rent seeking taxes or other financial instruments are rarely applied in environmental policy. [Damania \(1999\)](#) shows that emission standards are more frequent when interest groups are at work, whereas emission taxes are more likely when parties represent environmental interests. In fact, we show that majority voting yields a different result: a majority of low polluters has stronger incentive to adopt a strict standard, whereas a majority of large polluters would be better off with a tax. [Aidt and Dutta \(2004\)](#) study the transition from command-and-control instruments, usually adopted when environmental targets are lax, towards either an emission tax or tradeable permits. The latter are supported by the lobby of polluting firms, the former is preferred by citizens,

³ According [Parry and Small \(2005\)](#) the optimal gasoline tax in the US is \$1.01/gal, more than twice the current rate. [Lin and Prince \(2009\)](#) find that for California this tax should be \$1.37/gal (over three times the current level). The International Center for Technology Assessment computed that indirect costs to society total around \$12/gal. (\$3.17 per liter; cf. [www.icta.org](#)). [Parry and Small \(2005\)](#) also find that the gasoline tax is above the socially optimal level in the UK.

⁴ For a model which incorporates voting and lobbying, although not about externalities and instrument choice, see [Alesina and Tabellini \(2008\)](#).

⁵ See [Knight \(forthcoming\)](#) for a discussion of the efficacy of such regulations.

⁶ For a survey in favor or against environmental taxes and quantitative regulations, with some reference to political economy issues, see [Hepburn \(2006\)](#).

⁷ In a related work they consider the role of militants and opportunists within political parties ([Cremer et al., 2008](#)).

⁸ For a survey, see [Aidt \(2013\)](#).

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