



Cross-border externalities and cooperation among representative democracies



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ABSTRACT

This paper analyzes the provision of public goods with cross-border externalities by representative democracies. The level of provision of each country is decided by a policy maker elected by majority rule at the country level. We compare the case in which policy makers set their policies noncooperatively with the case in which they set their policies through Coasian cooperation. Cooperation induces policy makers to internalize cross-border externalities, but it also induces strategic voters to elect a policy maker who cares less about the public good to reduce their public good contribution. The former effect increases public good provision while the latter reduces it. We show that once voters' incentives are taken into account, whether cooperation is beneficial depends neither on voters' preferences, nor on the magnitude of spillovers, nor on the size, bargaining power, or efficiency of each country. Instead, it depends only on the curvature of the demand for the public good: cooperation increases (decreases) public good provision when the demand function is more (less) convex than the unit elastic demand function. Hence, the desirability of international cooperation depends mostly on the type of public good considered.

1. Introduction

Cross border externalities and transnational public goods lead to inefficiencies and collective action failure when countries set their policies noncooperatively. In the absence of overarching political institutions, observers often call for greater coordination between national policy makers to internalize these externalities. However, despite the multiplication of international negotiations and summits, the supposed gains from international cooperation have arguably not fully materialized. Many global public goods such as the reduction of greenhouse gas emission, political asylum, disease eradication, fish stocks, or fiscal stimulus are still underprovided.

Since Coase (1960), economists have invoked transaction costs of various sorts to explain the inability of bargaining parties to reach mutually beneficial arrangements.¹ This strand of literature focuses on the bargaining process and does not take into account the specificities of the political process within each country. Others have argued that international policy coordination can exacerbate inefficiencies in national politics.² This paper assumes away any inefficiencies in national politics or in Coasian cooperation, and focuses instead on the *interaction* between elections at the national level and cooperation at the international level.

In modern democracies, most decision are taken not by the voters, but by political representatives appointed by the voters. As Persson and Tabellini (1992) first pointed out, even if one abstracts away from political agency issues, this distinction has important

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¹ Among others, commitment and enforcement problems (Williamson, 1985; North, 1990; Acemoglu, 2003) or imperfect information (Mailath and Postlewaite, 1990; Harstad, 2007) can lead to inefficiencies.

² International policy coordination can exacerbate political agency problems (Brennan and Buchanan, 1980; Buchanan and Faith, 1987; Tabellini, 1990; Persson and Tabellini, 1995) or dynamic commitment problems between voters and politicians (Rogoff, 1985; Kehoe, 1989).

consequences, because sophisticated voters can use elections as a strategic delegation mechanism. Several papers have shown that once voters' incentives are taken into account, the impact of international cooperation on public good provision is ambiguous (Segendorff, 1998; Gradstein, 2004; Buchholz et al., 2005; Kempf and Rossignol, 2013). On the one hand, cooperation helps national policy makers internalize cross-border spillovers. This direct effect increases public good provision. On the other hand, more public good requires greater contributions from participating countries. As a result, cooperation induces strategic voters to elect representatives who care less about the public good, so as to decrease their relative contribution. This electoral effect decreases public good provision. In this paper, we determine the main drivers of the magnitude of this electoral effect, and characterize the conditions under which it only mitigates, or completely offsets the direct effect of cooperation.

We consider a model with two countries populated by a continuum of heterogeneous voters. Each country must decide the level of provision of a public good with cross-border externalities. The preferences of a given voter are characterized by a type that determines her trade-off between public good and private good consumption. This type can be interpreted as her *tax price* for the public good, and the mapping between her tax price and her most preferred level of public good is the *public good demand function*. Countries' policies are determined in a two-stage game. In the first stage—the electoral stage—each country elects a representative among its residents by majority rule. In the second stage—the policy-making stage—the elected representatives choose, cooperatively or noncooperatively, the level of provision of their respective public good. In the cooperative regime, the representatives implement the generalized Nash bargaining solution with the noncooperative outcome as the bargaining default.

The main result is that whether cooperation increases the equilibrium level of public good relative to the noncooperative regime depends neither on the distribution of voters' preferences, nor on the magnitude of cross-border spillovers, nor on the relative size, efficiency, or bargaining power of each country. Instead, it depends only on the curvature of the demand for the public good. In the basic model, cooperation increases (decreases) public good provision if the public good demand function is more (less) convex than the unit elastic demand. This result holds unchanged for a large class of bargaining solutions. Making the two public goods closer substitutes makes cooperation more likely to be beneficial, but does not change the qualitative nature of the result. The model further shows that once voters' incentives are taken into account, allowing for transfers across countries can make cooperation detrimental.

That the desirability of cooperation is independent of the magnitude of spillovers may appear surprising, because the magnitude of the spillovers determines the inefficiency of the noncooperative equilibrium, and thus the potential gains from cooperation. The intuition for that result is as follows. Relative to the noncooperative equilibrium, cooperation requires the policy maker of, say, country 1 to provide more public good, and thus its voters to pay higher taxes. This impact of cooperation on the voters of country 1 is due to the internalization of the externality they impose on country 2. Therefore, as the magnitude of this externality increases, the cost of cooperation on the voters of country 1 increases. In the electoral stage, these voters react to the greater cost of cooperation by appointing a representative with a higher tax price for the public good, thereby offsetting the effect of greater spillovers in the policy-making stage of the cooperative regime.

The intuition behind the role of the convexity of the public good demand function is more subtle and stems from the distributive effect of Coasian cooperation. As first intuited by Schelling (1960), since Coasian cooperation tends to equalize the gains from cooperation, it generates incentives to strategically delegate the negotiations to an agent who has less to gain from cooperation. Whether these incentives induce voters to elect a higher or a lower tax price representative turns out to depend solely on the curvature of the demand function. The reason for this is as follows. Cooperation basically prescribes the representative of each country to behave as if his tax price for the public good is subsidized at a rate that corrects for the externality, even though the subsidy is not actually paid. Thus, the cost of cooperation for each representative is the deadweight loss of a proportional subsidy. Simple calculus shows that the deadweight loss of a proportional subsidy, as given by the well-known Harberger formula, increases (decreases) in the pre-subsidy price when the demand function is less (more) convex than a unit elastic demand. So when the public good demand is, say, less convex than a unit elastic demand, as the tax price of the representative increases, his private cost of internalizing the externality his country imposes increases. Coasian cooperation compensates him for this greater cost by tilting the bargaining outcome in his favor and requiring a greater contribution from the other country, relative to the case of a unit elastic demand function. This distributive effect of cooperation in the policy-making stage exacerbates voters' incentive to appoint a higher tax price representative in the electoral stage, which decreases public good provision.

Our results shed light on the debate over the structure of federal systems. Several competing principles have been invoked to determine the optimal allocation of policy responsibilities between central and local governments. One of them, “cooperative federalism,” states that federal policies should be negotiated by and “agreed to unanimously by the elected representatives from each of the lower tier governments” (Inman and Rubinfeld, 1997). Our analysis suggests that strategic voting can greatly affect the supposed gains from cooperative federalism. Moreover, contrary to received wisdom (Oates, 1972), whether cooperative federalism dominates decentralization depends neither on the heterogeneity of local preferences nor on the magnitude of externalities, but on the curvature of the demand for the public good, and thus on the type of public good.

Our results can be related to the empirical literature on the demand for public goods. This literature typically assumes isoelastic demand functions. For such demand functions, our results imply that cooperation is beneficial if and only if the tax price elasticity of the public good demand is greater than 1. Interestingly, empirical estimates of this elasticity vary greatly between public goods (see, e.g., Feldstein, 1975; Brooks 2007). Hence, our results imply that the efficiency of interjurisdictional cooperation can differ importantly across types of public goods. Moreover, estimated elasticities are often smaller than one (Wildasin, 1987; Auten et al., 2002). Therefore, this model suggests that for plausible specifications, strategic voting can severely offset the gains from Coasian cooperation between sovereign democracies. Hence, stronger forms of cooperation are required, such as pooling of sovereignty, or explicit cost sharing.

The paper is organized as follows. Section 2 reviews the literature. Section 3 describes the basic good model. Section 4 derives the

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