



# Democracy, redistributive taxation and the private provision of public goods

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## ABSTRACT

The paper studies in a simple, Downsian model of political competition the private provision of public goods embedded in a system of democracy and redistributive taxation. Results show that the positive effect of inequality on production of public goods, to which Olson (1965) pointed, is weakened and might even be reversed in this context. Also, the median voter may choose a negative tax rate, even if he or she is poorer than the mean, in order to stimulate production of public goods. The relevance of the model is illustrated with an application to the financing of higher education.

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## 1. Introduction

One of the primary justifications for the existence of the state is its ability to supply public goods. However, not all public goods are supplied by the state, nor could they be. An important example is the generation of knowledge and innovation. While the state in most countries finances and sponsors universities and other research facilities, significant formal and informal innovation with important spill-over effects takes place in the private sector. In countries where the capacity of the state is low, and even where it is not, the supply of public goods such as infrastructure, environmental protection and even security might be fully or partly left to the private sector.

This paper investigates in a simple, Downsian model of electoral competition how the private provision of public goods interacts with the institutions of democracy and with taxation. We assume that a public good, such as non-excludable innovation, is produced by the private sector, and that the income derived from the good is taxed at a (positive or negative) rate determined by a democratically elected government. The paper studies how democracy, taxation and economic inequality affect the production of the public good. In particular, two seemingly divergent findings from the literature are brought together: on the one hand, Mancur Olson (1965) and others have argued that higher inequality increases the supply of public goods, because only the most well-endowed individuals in an economy have the incentives to contribute to the supply of these goods. Redistribution in favor of these people strengthens their incentives to provide or voluntarily finance public goods. On the other hand, Meltzer and Richard

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(1981), building on Romer (1975), argued that in a democracy, higher inequality leads to lower economic activity, because a poorer median voter, relative to the mean, prefers a higher tax rate, which diminishes productive incentives.<sup>1</sup> In this paper I show that in the presence of democracy and taxation when a large share of income is derived from production of public goods, the “Olson” and “Meltzer–Richard” effects tend to cancel out. The net effect of economic inequality on production might be either positive or negative.

It is well known that, in general, taxation to finance public goods can be Pareto improving, whereas purely redistributive taxation cannot (see e.g. Mueller, 2003; Hillman, 2009). In the model presented here, however, redistribution may lead to Pareto improvements by stimulating the private provision of public goods. I investigate the condition under which this outcome is a political-economy equilibrium. The results suggest that the introduction of democracy and taxation increases total economic production, and improves welfare for both the median voter and the wealthy elite, if and only if the initial distribution of economic resources is sufficiently equal. If inequality is sufficiently low, it is possible for democracy and taxation to result in Pareto improvement. This contrasts with other models of redistributive taxation, such as that for example of Meltzer and Richard, where democracy and taxation necessarily result in lower economic activity and never in Pareto improvement. The conjunction of effects that I describe contributes to explaining why democracy is more readily sustainable in equal than in unequal societies.

Section 2 presents the model. Section 3 discusses the effects of inequality on production of public goods, while Section 4 analyzes the effects of introducing democracy. Section 5 considers a specific type of public goods production function, namely a power function. Section 6 presents an extension of the model, in which the capacity of each individual to contribute to the public good is limited. In Section 7, the model is empirically illustrated in an application to funding of higher education. Under plausible assumptions, the model predicts that governments in countries with more equal pre-tax distribution of incomes provide greater public funding of higher education than unequal ones. This prediction is confirmed in an analysis of government spending on tertiary education in a broad sample of countries.

## 2. Model

### 2.1. Production of public goods

Consider an economy consisting of  $N$  individuals, indexed  $i = 1 \dots N$ . For concreteness, think of a local, rural economy in a developing country and think of the people as farmers or fishermen. Each person maximizes the following utility function:

$$U_i = \frac{X_i}{\sum_{j=1}^N X_j} G\left(\sum_{j=1}^N e_j\right) - e_i = x_i G\left(\sum_{j=1}^N e_j\right) - e_i$$

subject to:

$$e_i \geq 0$$

where the first term represents income from a public good,  $G\left(\sum_{j=1}^N e_j\right)$ , which is converted one-to-one into utility. Assume that  $G \geq 0$ ,  $G' > 0$  and  $G'' < 0$ . The second term ( $-e_i$ ) represents the disutility derived from supplying effort to the production of this good. This could be interpreted either as disutility of labor, or as the opportunity cost of effort stemming from the possibility of producing a private good with the use of  $e$ . Assume for now that there are no binding, upper constraints on  $e_i$ . This assumption is relaxed in Section 6 below.  $X_i$  represents individual  $i$ 's holding of some good which determines his or her stake in the public good.  $x_i$  is then  $i$ 's share of the total, fixed amount of  $X$  in the economy. This formulation of the public goods problem follows Baland and Platteau (1997).  $G$  could for example be the production of knowledge. In developing country agriculture there is often a large premium on the introduction of new crop varieties or production techniques, such as the use of chemical fertilizers. However, the profitability of new production methods depends on knowledge about how they are optimally adapted to local circumstances. This knowledge is often a public good, because production methods and outcomes are easy to observe in agriculture. When one farmer experiments with new techniques, the lessons gained from the experiment will be picked up and learned by other farmers in the area. Other important public goods could be irrigation canals or roads.  $X$  could be interpreted as agricultural land. For example, the more land a household owns, the more it will gain from an increase in knowledge about new production methods in agriculture.

<sup>1</sup> Several studies, including Lindert (1996), Perotti (1996) and Moene and Wallerstein (2001) have argued that the empirical support for the hypothesis that inequality leads to redistribution is weak. Harms and Zink (2003) summarize a series of theoretical arguments that rationalize these findings. In contrast, Milanovic (2000, 2010) shows that when the theoretically relevant variables are used, there is in fact strong evidence of a link between inequality and redistribution. He finds, however, that the median voter does not on average gain from redistribution and suggests two possible explanations. First, the median voter may gain from redistribution in the long run, through an insurance effect, even if he or she loses contemporaneously. Alternatively, policies may not actually reflect the preferences of the median voter. The present paper proposes another reading. In the model presented here, the median voter in some cases receives negative net transfers but nevertheless benefits from the redistributive system because of the positive externalities generated by transfers to other groups. Hence, the finding that a system of redistribution does not directly transfer resources to the median voter, either in the short- or the long run, does not necessarily mean that the system does not reflect the preferences of that voter. (While positive externalities in the model presented here result from transfers to the rich, we can also imagine that transfers to the poor generate positive side-effects, for example in the form of reduced crime and less social instability).

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