

Voluntary Contributions Vote Out Public Ones

Aleix Calveras¹ Juan-José Ganuza² Gerard Llobet³

¹Universitat de les Illes Balears

²Universitat Pompeu Fabra, Barcelona GSE, and SP-SP

³CEMFI

Workshop on Markets and Society – March 10, 2009

About Philanthropy

- Private donations by individuals amounted in 2002 to over \$183 billions. Individuals make 76% of all donations. It has increased in recent years and it now corresponds to 2% of available income.



- Private donations are used to finance many projects that could also be publicly supported (Education, Health, Environment, International aid, Youth Development, Art and Culture, etc)...

- Private donations are used to finance many projects that could also be publicly supported (Education, Health, Environment, International aid, Youth Development, Art and Culture, etc)... including highways.



Private vs Public

- The interaction between the private and public provision of public goods is a central topic in public economics:
 - Public funding is typically carried out using distortionary taxation, imposed to all agents in the society.
 - Private provision is the result of the donations of individual agents that do not necessarily benefit from their transfer.
- Two central questions in the literature are:
 - Why people donate, and
 - the effect of taxes over private donations.



Why People Donate?

- In small populations people donate due to the impact they make. The free-riding problem leads to suboptimal provision (Bergstrom, Blume, and Varian (1986)).
- In large populations people have a negligible impact over the level of the public good. Hence, people donate because they experience some joy of giving, such as a “warm-glow” (Andreoni (1989,1990)) or prosocial preferences (Benabou and Tirole (2007)).



How Taxes Affect Donations?

There is a concern about the *crowding out* that taxes may exert over private contributions.

- Warr (1982) and Roberts (1984) show that, absent warm-glow, government contributions fully crowd out voluntary contributions.
- Warm-glow makes the crowding out imperfect, which is consistent with empirical evidence.



How Taxes Affect Donations?

There is a concern about the *crowding out* that taxes may exert over private contributions.

- Warr (1982) and Roberts (1984) show that, absent warm-glow, government contributions fully crowd out voluntary contributions.
- Warm-glow makes the crowding out imperfect, which is consistent with empirical evidence.

This literature takes taxes as exogenous. But taxes are also determined by agent preferences through a political process...

This is the first paper that considers jointly the determination of the taxes and private contributions to a public good.



The Goal of the Paper

- We observe very different patterns in the financing of public goods across countries. For example, the US relies more on private contributions than European countries.
 - Andreoni (2006) shows that whereas in the US private contributions amount to 21% of the revenues of the non-profit sector, in Europe these contributions are between 3% and 11%.

The Goal of the Paper

- We observe very different patterns in the financing of public goods across countries. For example, the US relies more on private contributions than European countries.
 - Andreoni (2006) shows that whereas in the US private contributions amount to 21% of the revenues of the non-profit sector, in Europe these contributions are between 3% and 11%.
- We endogeneize these patterns as the result of different altruism that affects both the level of taxes chosen in the society and the individual contributions through donations.
- Does a more altruistic society lead to
 - more/less private donations?
 - higher/lower taxes?
 - a larger/smaller stock of public goods?

This Paper

- We study an economy where the public good is provided both through donations and taxes.
 - Taxes are decided through a political process.
 - Donations are affected by heterogeneous warm-glow preferences, and the existing tax rate.
- We show that more altruistic societies lead to a higher level of donations and consequently a higher level of the public good for a *given* tax rate.
- However, more altruistic societies may opt for a lower tax rate. In other words, private contributions *vote out* public ones.
- The compounded effect of more altruism on the total stock of the public good is ambiguous.
- We show that these results are robust to different specifications of imperfect altruism.

The Model

- An economy with a continuum of agents of mass 1.
- G is the stock of a public good, resulting from adding all individual contributions, g .
- The total contribution of an individual g has an opportunity cost $C(g)$, with $C' > 0$, $C'' > 0$ and $C'(1) = 1$,
- This contribution is the result of two parts:
 - τ is the (lumpsum) tax that establishes a minimum contribution to this good ($g \geq \tau$), and
 - $g - \tau$ is the voluntary contribution (donations).
- Because agents are atomistic, individual contributions have a negligible effect on the total public good.



- Individual contributions exist because agents have warm-glow preferences. That is, they derive utility from their voluntary contributions.
- In particular, each agent has a utility of the form

$$U(g, \tau) = G + \theta (g - \tau) - C(g).$$

- The parameter θ measures the (idiosyncratic) intensity of their *warm-glow preferences*.
- These preferences are heterogeneous across consumers. We assume that $\theta \in [0, 1]$ and it is distributed according to $\Phi(\theta, s)$.
- s orders distributions according to the first order stochastic sense.



Timing

- Two stages:
 - 1 Agents simultaneously decide (through majority voting) on the level of the tax τ .
 - 2 Agents choose independently the level of their contribution, g , constrained to the condition $g \geq \tau$.
- We start by characterizing the First Best...

The First Best

- We do not include in the social welfare function the warm-glow (see Andreoni (2004)).
- As a result, the value of g that maximizes welfare solves

$$\max_g G - C(g),$$

which given our normalization of C implies $g^s = 1$ and $G^s = 1$.

- Now we solve the model by backward induction.



The Second Stage: Contributing

- For a given level of τ , agents choose g so as to

$$\max_{g \geq \tau} G + \theta (g - \tau) - C(g).$$

with FOC (when g is not binding) of

$$\theta = C'(\hat{g}).$$

where $\hat{g}(\theta)$ is increasing in θ .

- Hence, the privately optimal contribution to the public good corresponds to

$$g^*(\theta) = \max\{\hat{g}(\theta), \tau\}. \quad (1)$$

- Aggregating among all agents, the total level of public good is

$$G \equiv \int g^*(\theta) \phi(\theta, s) d\theta.$$

Results Consistent with the Previous Literature

Remark (Altruism leads to higher provision)

For a given level of taxation τ , a more altruistic society will yield a higher stock of the public good. In other words, for a given τ , G is increasing in s .

Results Consistent with the Previous Literature

Remark (Altruism leads to higher provision)

For a given level of taxation τ , a more altruistic society will yield a higher stock of the public good. In other words, for a given τ , G is increasing in s .

Remark (Public contributions Crowds Out private ones)

At the individual level, an increase in the tax rate crowds out voluntary contributions at a one-to-one rate.

At the aggregate level, crowding out is not perfect, since only constrained agents increase their overall contribution. Hence, for a given distribution of preferences, a higher tax rate yields a higher level of the public good (whenever the tax rate is binding for some agents).

The First Stage: Voting

- Anticipating their own voluntary contributions and those of the rest of the agents, the utility of voters can be written as

$$V(\theta, \tau, s) \equiv \int g^*(x) \phi(x, s) dx + \theta (g^*(\theta) - \tau) - C(g^*(\theta)),$$

where

$$g^*(\theta) = \max\{\hat{g}(\theta), \tau\}.$$

- An increase in τ implies a trade-off:
 - It is always individually costly to increase τ (it decreases voluntary or it increases the total contribution), but
 - it increases the sum of all contributions



The Optimal Individual Tax Level

- We denote by $\tau^*(\theta, s)$ the tax level that maximizes the utility of an agent of type θ . In other words,

$$\tau^* \in \arg \max V(\theta, \tau, s).$$

- The overall effect can be decomposed as
 - The **Aggregate Effect** and
 - the **Median Voter Effect**.



The Aggregate Effect

Lemma

The function V is submodular in s and τ .

- When society becomes more prosocial, the individual cost of a contribution is unchanged.
- However, when s increases the impact of a larger τ is smaller, because the proportion of agents for which the tax is binding, $\Phi(\underline{\theta}(\tau), s)$, diminishes.
- Hence, the larger is s the less willing is any given agent to increase τ .



The Median Voter Effect

Lemma

The function V is submodular in θ and τ .

- When the agent is more prosocial, the social benefit of increasing the tax rate is unchanged.
- However, for more prosocial agents, a higher tax makes the voluntary contribution beyond the tax level more expensive. For this reason, he is more interested in setting a low tax in order to benefit from his voluntary contribution.
- Hence, the larger is θ the lower the preferred tax.



The Outcome of the Voting Game

- First notice that given the monotonicity, induced by the Median Voter Effect, the outcome of the voting game corresponds to the preferred choice of the median voter.

Proposition

Majority voting in a more altruistic society leads to a lower tax rate.

- Suppose we move from s to $s' > s$.
 - The aggregate effect implies *for all* voters interest in decreasing the tax rate.
 - The median voter moves from θ to $\theta' \geq \theta$, who according to the median-voter effect prefers also a lower tax.



Voluntary Contributions Vote Out Public Ones

Remark

Increases in altruism lead to increases in voluntary contributions that vote-out mandatory contributions through lower taxes.

$$G = \tilde{\tau}^*(s) + \int_{\underline{\theta}(\tilde{\tau}^*(s))} (\widehat{g}(\theta) - \tilde{\tau}^*(s)) \phi(\theta, s) ds.$$

- Crowding out: Increases in τ raise the mandatory contribution but decrease the voluntary ones.
- Voting out: Increases in s raise voluntary contributions but (in the voting equilibrium) decreases mandatory ones



Main Result

Proposition

The equilibrium provision of the public good G is not in general globally increasing in s .

- With some abuse of notation, a change in s could be described as the following

$$\frac{dG}{ds} = \frac{\partial G}{\partial s} + \frac{\partial G}{\partial \tilde{\tau}^*} \frac{d\tilde{\tau}^*}{ds}.$$

- The total effect is, in general, ambiguous but in many examples the negative effect is easy to characterize.



An Example

Example (The Binomial Case)

Assume Φ is a two-point distribution so that $\theta = 1$ with probability α , while $\theta = 0$ with probability $1 - \alpha$. Let $C(g) = \frac{g^2}{2}$.

In the second stage of the model, for a given τ , $\hat{g}(0) = 0$ and $\hat{g}(1) = 1$. Therefore, $g^*(0) = \tau$ and $g^*(1) = \max\{1, \tau\}$. The equilibrium level of τ (determined at the voting stage) depends on the proportion of voters of each type.

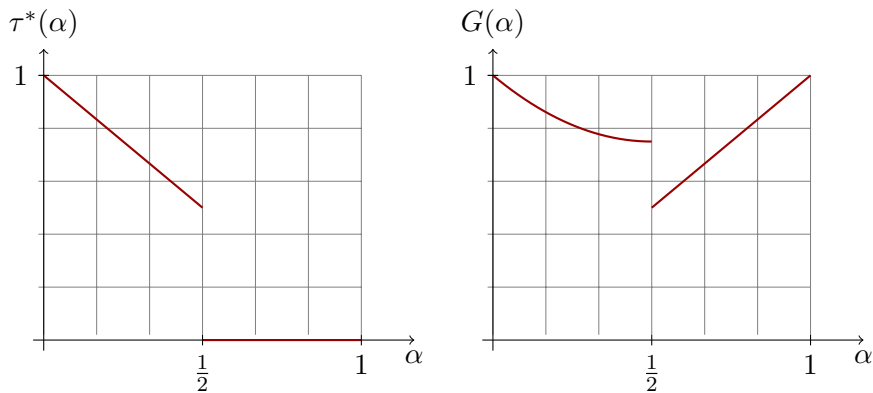


Figure: Equilibrium tax rate and total provision of the public good.

Alternative Preference Specifications

- **Warm-glow from Giving and from Taxes:**

$$U(g, \tau) = G + \theta(g - \beta\tau) - C(g),$$

where $\beta \in [0, 1]$ measures the difference in weights.

- **Reputational Giving:**

$$U(g, G) = G + \theta(g - \bar{g}) - C(g),$$

where \bar{g} is the average contribution in society to the public good.

- The Aggregate effect is robust to these changes in preferences.
- The Median-Voter effect can change but there are still examples where increases in altruism result in decreases in the public good.



Concluding Remarks

- Previous literature has emphasized the effect of preferences and taxes over private donations. This paper extends the analysis by pointing out that taxes are also endogenous to preferences (for example, through the political process).
- We have emphasized that in societies more prone to donate (more altruistic) the political game gives incentives to voters to reduce taxes. We call it the **Aggregate Effect**.
- With warm-glow preferences, more altruistic voters choose lower taxes. We call it the **Median Voter Effect**.
- Both effects go in the same direction, more altruistic societies (in the sense of more warm-glow giving), result in lower taxes.
- More altruistic societies have more private donations but lower public funds. The total effect over the level of the public good is ambiguous.