

Made available courtesy of the National Tax Association: <http://www.ntanet.org/>

ENVIRONMENTAL AND SOCIAL SERVICE CHARITIES: PRIVATE AND PUBLIC SOURCES OF FUNDING

Garth Heutel, Harvard University

PUBLIC GOODS PROVISION IS A TOPIC OF INTEREST both academically and in a policy arena. Left solely to private decision makers, a public good is provided at a less than optimal level. The clear policy solution is government provision of the good. However, even in the case of government provision, an individual may still choose to provide public goods, either due to the extent to which the benefits from the good are captured by the individual, or to a “warm glow” received from contributing. Thus, when policy makers choose provision levels, they must account for the level of private provision; otherwise the public good may in fact be *oversupplied* relative to the optimal level.

The interaction between public and private sources of contributions to public goods is of special importance to environmental policy. Numerous environmental public goods, including clean air and reserved open space, are provided by both public and private funding. Cap-and-trade policies, in which the government mandates a fixed maximum industry-wide level of emissions and allows firms to trade permits to achieve the goal, exemplify this. Permits may be purchased by anyone, not merely potential emitters, and many environmental groups are actively involved in purchasing and retiring permits to reduce the total amount of pollutants.¹ Parkland can be provided publicly, such as with national or state parks, or through private organizations. There is currently much emphasis on expanding public-private partnerships in helping the environment. Massachusetts in 2003 created the Office of Public Private Partnerships within the Executive Office of Environmental Affairs to coordinate such efforts. The Bush Administration has long favored a voluntary approach to environmental regulation, where governments and private firms collaborate on achieving environmental goals.

The issue of private or voluntary provision of public goods is vital to the policy issue of climate change. The climate is not merely a public good; it is a *global* public good. To the extent that emissions mitigation must be implemented by nations, it must be provided voluntarily by these nations, given that no super-national authority can mandate emissions

reductions from individual nations. Designing appropriate policies and incentives to achieve optimal provision of this global public good is a central area of applied research.²

A literature that examines this interaction between public and private funding of public goods deals with the specific question of how public funds crowd out or crowd in private funds. Many papers use data from nonprofit organizations to address this issue. Most of these studies focus on a single type of charity, usually social service charities. This group of charities includes those that address problems of hunger, homelessness, housing, crime, and other social problems. Other papers focus on arts organizations. No papers address the issue of crowding in or crowding out by looking specifically at environmental charities. In this paper, I extend a chapter of my dissertation and compare results from a model of the crowding in and crowding out of public and private contributions to charities, using data from both social service charities and environmental charities. The results from the two sets of charities are quite different. The data from social service charities are consistent with the model: government grants to charities crowd in private donations due to a signaling effect, and private donations crowd out government grants. For environmental charities, these predicted results are not found with significance. Because the results from the two sets of charities, providing different types of public goods, are so different, they urge caution in applying the results from a particular type of charity or public good to a broader class.

In the next section, I briefly summarize the model I use to make the predictions described previously, and I introduce some related literature. I then describe the data used, followed by the results. I end with a conclusion interpreting the differences between the two sets of charities.

CROWDING OUT AND CROWDING IN OF PUBLIC AND PRIVATE CONTRIBUTIONS

When government contributes to provide public goods, individuals may offset changes in govern-

Made available courtesy of the National Tax Association: <http://www.ntanet.org/>

ment contributions, if individuals care only about the total level of provision of the public good. The earliest papers on the crowding out of private donations by government grants, in fact, show that in this case crowding out is perfectly one-for-one, so that the total level of provision is unaffected by the government's chosen level. This is the result reached in both Warr (1982) and Roberts (1984). However, empirical evidence has often found that where there is crowding out of government grants, it is less than one-for-one. Kingma (1989) finds only partial crowding out of donations for public radio stations. A common explanation for this result is provided in Andreoni (1989), who suggests that individuals receive utility both from the total amount of the public good and the amount that is donated by that particular individual: a "warm glow" effect. With this effect, private and public contributions to the public good are no longer perfect substitutes, so the one-for-one crowding out is no longer present.

Though many studies find crowding out of private donations, some find crowding in: an increase in government grants to a charity leads to an increase in private donations to that charity. This is found in Khanna and Sandler (2000) for charities in the United Kingdom and Payne (2001) for academic research institutions. A number of different explanations for this phenomenon are provided in Rose-Ackerman (1986). The explanation that I focus on here is one of signaling: the government grants provide information to potential donors about the quality of the charity. Signaling in charitable contributions is also studied by Andreoni (1998), who develops a model of seed money from large private donors resolving uncertainty about the quality of a public good, and in List and Lucking-Reiley (2002), who conduct a field experiment and find evidence for the crowding in of seed money.

In Heutel (2007), I make two contributions to this literature, which I summarize here. Details are available in that paper. First, while the literature focuses on how government grants affect private donations, I examine causality in the other directions. If government grants can crowd out private donations, can private donations crowd out government grants? By simply extending the standard model of crowding out by allowing the government's level of contribution to be endogenous, the best response functions for both individuals and the government do indeed show that crowding out is possible in either direction.

Second, I add uncertainty to the standard crowding out model and allow for government grants to act as a signal of that uncertainty. In this case, government grants can cause crowding in, if a higher level of grants signals a higher quality of the public good. As potential donors observe higher levels of grants to a charity, they update their beliefs about the quality of that charity and adjust their level of donations accordingly.

DATA ON SOCIAL SERVICE AND ENVIRONMENTAL CHARITIES

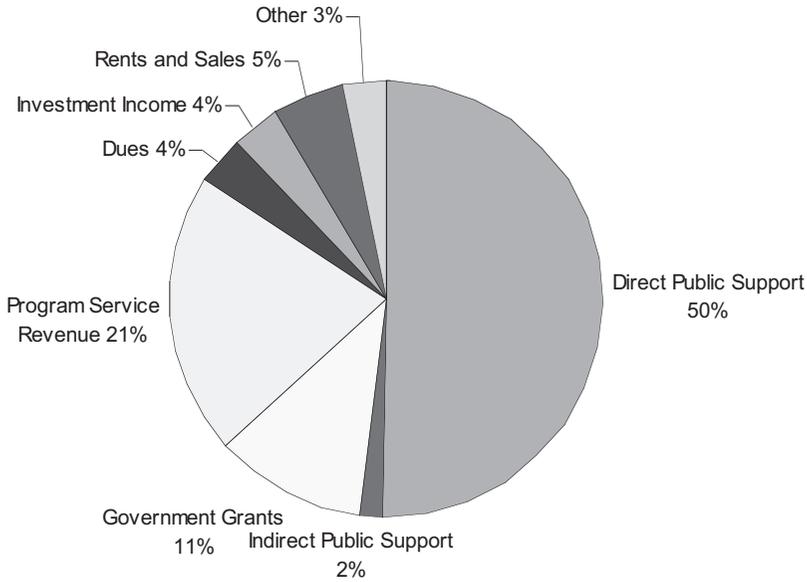
Data were obtained from the National Center on Charitable Statistics, at the Urban Institute.³ Data are collected from the IRS Form 990s that must be submitted by all 501(c)(3) nonprofit organizations that have at least \$25,000 in gross receipts annually, though religious organizations are excepted. The data are from fiscal years 1998-2003 and they include 1,388,480 total observations in an unbalanced panel. Organizations are classified according to the National Taxonomy of Exempt Entities (NTEE), which divides organizations into 26 major groups. I focus on charities classified into major groups C and D, representing "Environment" and "Animal-Related," respectively. Environmental charities are defined as those groups whose primary purpose is to preserve, protect, and improve the environment. Animal-related charities are defined as private nonprofit organizations whose primary purpose is to provide for the care, protection, and control of wildlife and domestic animals that are a part of the living environment; to help people develop an understanding of their pets; and to train animals for purposes of showing.⁴ Hereafter, I refer to all of these charities as environmental organizations. I compare the results based on data from environmental organizations to results based on a set of other types of social service organizations. This set includes organizations that focus on the following: crime, employment, food and nutrition, housing, human services, and community improvement.⁵ This set of organizations, hereafter referred to as social service organizations, provides a basis to see how the environmental organizations differ.

The differences in charities' revenue sources can be seen in Figure 1, which divides up the average source of funding for each type of charity into several categories.⁶ The revenue sources for the two types of charities are dramatically differ-

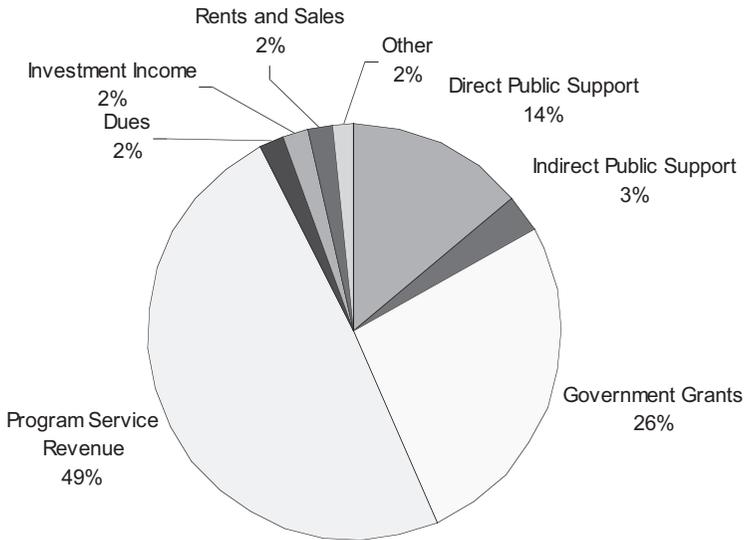
Made available courtesy of the National Tax Association: <http://www.ntanet.org/>

Figure 1

Sources of Revenue, Environmental Charities



Sources of Revenue, Social Service Charities



Notes: Environmental charities include those in NTEE codes C (Environment) and D (Animal-related). Social service charities include those in NTEE codes I (Crime and Legal-related), J (Employment), K (Food, Agriculture, and Nutrition), L (Housing and Shelter), P (Human Services), and S (Community Improvement and Capacity Building). Investment income includes interest and dividends; rents and sales includes securities and inventory; other includes special events' revenues.

Made available courtesy of the National Tax Association: <http://www.ntanet.org/>

ent. Environmental charities receive half of their revenue from direct public support, including individual donations, while social service charities receive only 14 percent from this source. Government grants constitute a much smaller share of environmental charities' revenues (11 percent) than of social service charities' revenues (26 percent). Social service charities get about half of their revenue from program services; environmental charities receive only one-fifth of their revenues from this source. The remaining sources of revenues are small for both types of charities, though environmental charities receive more in each of the remaining categories.

Table 1 presents revenues aggregated into four main categories. As a measure of private donations, I combine direct public support, indirect public support, and dues. Government grants and program service revenue have their own categories, and the remaining revenues are classified as "other." The top panel of Table 1 lists statistics for environmental organizations, the bottom panel for social service organizations. The number of environmental organizations is about one-fifteenth the number of social service organizations. On average, environmental organizations receive less total revenue than social service organizations (\$1,281,000 vs. \$1,975,000). Of this revenue, though, they receive a great deal more from private donations, and less from government grants and program service revenue. Finally, the mean values are all much higher than the median values, and even the 75th percentile values, suggesting a data set that is skewed towards high-revenue firms. These statistics suggest that the revenue sources for environmental charities are quite different than those of social service charities.

Trends in these values are presented in Figure 2. The top panel is for environmental charities; the bottom panel for social service charities. The values presented are the average per charity value of government grants and private donations in constant 2002 dollars. Just as shown in Table 1 for 2002 only, environmental charities receive more from private donations than from government grants, while social service charities receive more from government grants in all years.

The presence of crowding out in either direction implies that spikes in government grants would be accompanied by dips in private donations, and vice versa. For social service charities, no such pattern emerges, since both values appear to be increas-

Table 1
Summary Statistics—Charity Revenues

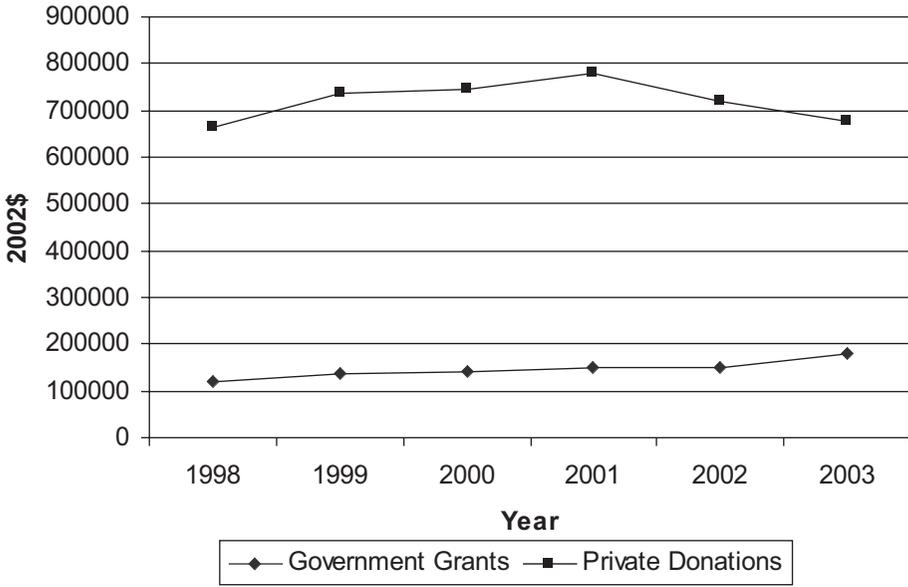
	Number of Observations	Number of Organizations	Mean (\$1,000s)	Standard deviation (\$1,000s)	Median (\$1,000s)	75 th percentile (\$1,000s)
Environmental Organizations	37,563	9,367	723	7187	96	283
Private Donations			149	1239	0	17
Government Grants			269	3062	6	82
Program Service Revenue			140	1779	10	46
Other Revenue						
Social Service Organizations	339,716	76,725	371	4840	40	182
Private Donations			521	3476	0	156
Government Grants			972	9413	61	396
Program Service Revenue			111	1345	8	43
Other Revenue						

Notes: Data are averaged over 1998-2003 in constant 2002 dollars. Private donations include direct and indirect public support and dues. Other revenue includes interest, rents, and sales.

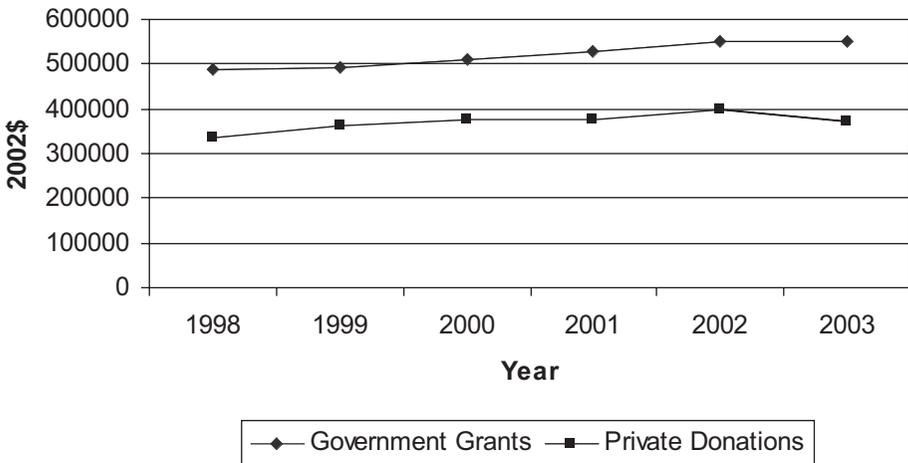
Made available courtesy of the National Tax Association: <http://www.ntanet.org/>

Figure 2

Environmental Charities



Social Service Charities



Notes: Environmental and Social Service charities are defined as in Figure 1. All dollar values are deflated by CPI.

Made available courtesy of the National Tax Association: <http://www.ntanet.org/>

ing. However, environmental charities exhibit this pattern. After 2001, a dip in private donations is accompanied by an increase in government grants.⁷ This is merely suggestive, so I turn to regression analysis to identify the presence of a crowding out effect.

RESULTS

I test for crowding out or crowding in of either government grants or private donations. This entails two regression equations; one where government grants is the dependent variable and one where private donations is the dependent variable. Analysis is done at the charity-year level in a fixed-effects framework. A number of control variables are included in both regressions. At the charity level, I include the amounts of program service revenue and all other revenue. At the county-year level, I include the unemployment rate, average household income, and total population, while at the state-year level I include the fraction of the population 65 or older, the fraction of a state's U.S. Congress and Senate delegations that are Democrats, and a dummy for whether the state governor is a Democrat.

A set of instruments is required for the level of government grants and another one for the level of private donations. I look to the literature for instruments for the level of government grants, since this direction of causality has been examined before. The instruments I use are state-year level measures of government transfers to individuals from Supplemental Security Income (SSI) programs.⁸ This is a measure of the "generosity" of the government in a particular year, or the availability of funds for charitable activity. An additional instrument is the average level of government grants to charities in a state-year.

I use two instruments at the state-year level for private donations. First is the price of a dollar of a charitable donation based on state and federal income tax rates and rules for allowing deductions of charitable contributions. This information is available from NBER's Taxsim program.⁹ Although a large literature finds that tax incentives do have significant impacts on individual-level charitable contributions, in this case this instrument has very low predictive power. This is because the tax rate used is a statewide average, and significant heterogeneity in marginal tax rates and itemization exists within states. Furthermore,

a charity may receive donations from individuals located in other states, so the tax incentives in the charity's home state do not necessarily apply to that charity's donors.

In addition to this weak instrument, I add a state-year level measure of disposable income, generated from the ratio of state-level average home prices, as measured by the Freddie Mac Conventional Mortgage Home Price Index, to the county-level per capita income. This ratio represents the fraction of the average consumer's income devoted to a large nondiscretionary expense and therefore unavailable for discretionary spending including charitable contributions.

Regression results appear in Table 2. The first two columns are from social service charities (replicating the results from Heutel (2007)), and the last two columns are from environmental charities. In columns one and three, the dependent variable is private donations and the endogenous regressor is government grants; in columns two and four those are reversed. The results from social service charities are consistent with the theories described previously. There is evidence that government grants crowd *in* private donations, as would be expected if government grants are signaling charity quality. The level of crowding in is about 60 cents per dollar. There is also evidence of government grants responding to private donations; in this direction the effect is one of crowding out. The magnitude of the crowding out effect in this direction is very large: greater than one-for-one. This may be due to endogeneity bias from instrument choice; Heutel (2007) shows that this result is not very robust to other specifications and alternative instrument choices. In columns three and four, the results for environmental charities are quite different. The sign of each coefficient is opposite that of its corresponding coefficient in the social service charities' regressions, but neither is significantly different from zero.

As described in Heutel (2007), though omitted here, the results from column one showing government grants crowding in private donations for social service charities are robust to a number of specifications, including regressing on lagged values of government grants, estimating simultaneously with 3SLS, weak instrument tests, and estimating by LIML instead of least squares. In none of these robustness checks is a significant coefficient found on the variables of interest in the equations for environmental charities.

Made available courtesy of the National Tax Association: <http://www.ntanet.org/>

Table 2
 Regression Results

	<i>Social Service Charities</i>		<i>Environmental Charities</i>	
	(1) <i>Dependent Variable</i> <i>= Private Donations</i>	(2) <i>Dependent Variable</i> <i>= Government Grants</i>	(3) <i>Dependent Variable</i> <i>= Private Donations</i>	(4) <i>Dependent Variable</i> <i>= Government Grants</i>
Endogenous Regressor (Government Grants or Private Donations)	.582** (.226)	-2.43* (1.16)	-.0744 (.199)	.135 (.503)
Program Service Revenue	.131* (.0614)	-.323** (.0413)	.120 (.0893)	-.0965 (.0554)
Other Revenue	-.0160 (.0146)	-.0794 (.0457)	-.0226 (.0427)	-.0215 (.0209)
Population	.00330 (.00442)	.0169 (.0115)	.00115 (.00357)	.00429 (.00275)
Income	-1.48 (1.03)	-2.17 (1.98)	1.93 (6.11)	-10.6* (4.70)
Unemployment Rate, Percent	1480 (1770)	-1270 (3710)	-8910 (11900)	-18300* (8610)
Percent Population > 65	-17000** (6110)	-42900* (20900)	-35500* (15900)	18200 (20000)
Number Dem Senators	2710 (4540)	8820 (9900)	-26200 (16700)	3250 (15200)
Percent Congress members Dem	4550 (21000)	62800 (47900)	1170 (70500)	-18000 (46300)
Indicator for Democratic governor	-8140 (5980)	3770 (11100)	16000 (19500)	-2460 (12500)
F-test on significance of instruments in first stage regression (p-value)	6.58 (.000)	2.66 (.0700)	1.77 (.1512)	0.31 (.576)
Overidentification Sargan test statistic (p-value)	4.83 (.0893)	0.000 (.9861)	0.630 (.730)	.895 (.344)
Number of Observations	175234	175234	16602	16602
Number of Charities	29206	29206	2767	2767

Notes: Data are from 1998-2003 and only include those organizations that are in the panel for all six years and whose reported categorical revenues sum up to reported total revenues, and likewise for expenses. Instruments for government grants are the state-year average value of grants to charities, the state-year total payments paid to individuals through SSI, and the state-year payments paid to individuals through SSI for the aged. Instruments for private donations are the calculated private cost of donations, based upon the state plus federal income tax rate and whether states allow charitable deductions, and the ratio of a state's home price index to a county's per capita income.

Made available courtesy of the National Tax Association: <http://www.ntanet.org/>

As an additional test for environmental charities, I select a particular category of charity and use instruments specific to that category to attempt to better identify the effect of private donations on government grants. The first instrument is the number of species listed as threatened or endangered under the Endangered Species Act (ESA), in a state-year. Listing a species is an early step in the process under the ESA. By listing a species, it becomes illegal to hunt or otherwise harm that species, but no governmental action is taken until possibly a critical habitat for the species is chosen. As of 1998, only 40 percent of listed species had designated critical habitat. Therefore, listing a species is expected to have no direct effect on government grants to charities that deal with endangered species. However, having a new species listed nearby is likely to promote individuals to donate to charities that deal with that issue. Since the ESA is widely reported in the media, individuals are likely to be aware of the new listings.¹⁰ The instruments used are a count of the number of species listed as either endangered or threatened in each state in each year.

The NTEE classification system category "D31" covers charities that deal with "Protection of Endangered Species." Because only a few of these charities (14) appear in the data set in all six years, I also include charities from category "D30": Wildlife Preservation and Protection. These charities are also likely to be impacted by announcements of the listing of endangered species. The results from these regressions, not presented here, are again insignificant. Though the new instrument is expected to identify the effect of private donations on government grants, none of the coefficients on that variable are significant. This may partly be due to the fact that so few charities fall into this category, especially in the columns that exclude the broader "D30" designation.

I next use a different instrument for private donations that applies to a different set of charities. The Toxics Release Inventory (TRI) is an EPA-sponsored program that publicly releases information on toxic chemicals emitted by individual plants. Businesses and government agencies self-report emissions, which are available on the EPA Web site. The reported level of emissions does not relate to any regulatory power; they are reported simply to inform the public and allow individuals to make more informed decisions about how pollution impacts their health. Because of this, reported TRI

emissions are likely to impact private donations to charities that deal with industrial pollution but are unlikely to affect government behavior directly. The NTEE category "C20" covers charities dedicated to "Pollution Abatement and Control." The regression results from this set of charities using this instrument also fails to find any evidence of the hypothesized effect of private donations on government grants.

DISCUSSION

This paper uses data from various types of public goods, but the results are important to environmental issues in particular. Both the regressions and the summary statistics show that, compared to social service charities, environmental charities behave in significantly different ways when it comes to finances. They get a lower fraction of their funding from government grants and a higher fraction of their funding from private donations. While the evidence presented here shows a significant relationship between government and private funding of social service charities, no such relationship is found for environmental charities. Since environmental charities behave so much differently than other types of charities, it is errant to extrapolate results found from other charities to environmental charities.

The results for environmental charities are insignificant. Though there are fewer observations from environmental charities than from social service charities, there are still tens of thousands, so small sample size is not likely to be a problem.¹¹ The data from environmental organizations may contain more measurement error, especially as these charities tend to be smaller in terms of total revenues and younger. For both reasons, these charities may be less knowledgeable about the reporting requirements for the IRS forms. Another reason for the insignificant results for environmental charities may be that by looking only at data from charities, I am unable to capture any other types of crowding out behavior that may be unrelated to the charities. For example, in response to an increase in government grants to environmental charities, individuals may not alter their contributions to charities, but instead alter their level of volunteering or recycling.¹² Similarly, governments may respond to an increase in private donations by decreasing funding to the EPA or other environmental activities besides the particular charity affected. This would bias downward my estimates of crowding out.

Made available courtesy of the National Tax Association: <http://www.ntanet.org/>

According to White House audits, the total amount of federal grants to environmental charities in 2004 was \$143 million, whereas the 2005 EPA budget totaled \$7.8 billion. Much of the EPA's spending went to grants paid to states and tribal governments, which may in turn have used that federal money to pay grants to environmental charities. But it is clear that at least some and perhaps a large fraction of the money that government uses to provide environmental public goods are provided in other ways besides grants to charities. How this effect may bias the results is unclear. If grants to charities are a constant fraction of government spending on public goods, then no bias exists, since the increase that I see in the data in government grants to charities corresponds to an increase in actual government provision of public goods. However, if the government substitutes nonprofit grants for other spending on public goods (so that when I see an increase in grants in the data, the actual government provision of public goods may have stayed constant or decreased), then the results may be biased. If this effect is more pronounced for environmental public goods, this may explain the lack of significant results for those charities.

Acknowledgements

This paper is an extension of one chapter of my dissertation, done at the University of Texas at Austin. I thank my dissertation committee for their advice and guidance: Don Fullerton, Dean Corbae, Dan Hamermesh, Rob Williams, and Shama Gamkhar. I also thank participants at the National Tax Association meetings in Columbus, OH for helpful comments.

Notes

- ¹ A list of such organizations is available at <http://www.epa.gov/airmarkt/trading/buying.html#groups>.
- ² Aldy and Stavins (2007) discuss a number of policy options for international frameworks addressing climate change beyond the Kyoto period.
- ³ <http://nccs.urban.org>.
- ⁴ Specifically, environmental charities include those involved in pollution control and abatement; conservation and development of natural resources; control or elimination of hazardous or toxic substances including pesticides; solid waste management; urban beautification and open spaces development; environmental education and outdoor survival; and botanical gardens and horticultural societies. Animal-related charities include organizations that develop and maintain fish-

eries resources and wildlife habitats to preserve and protect endangered species and other wildlife; humane societies; veterinary services; aquariums; and zoos.

- ⁵ These are the organizations listed under the 1-digit NTEE codes of I, J, K, L, P, and S. This is the same set of codes used by Andreoni and Payne (2003) for their set of social service organizations. Here, I separate environmental charities from the rest of the group. Andreoni and Payne (2003) also exclude some organizations that they describe as not directly providing services, while I include all 501(c)(3) organizations in those categories (see their fn. 15).
- ⁶ The first category is direct public support, which is the main category of donations from individuals. Second is indirect public support, comprised mainly of donations given to the charities collected by federated fundraising agencies, such as the United Way. The next category is government grants, which includes monies from federal, state, and local governments. Program service revenue is the money collected from the services that form the organizations exemption from tax. For example, a hospital would count as program service revenue all of its charges from medical services or room charges. Dues collected includes only the amount of dues received that are not contributions, for example the dues that go towards a subscription to a newsletter or some other benefit. Investment income includes dividends and interest on savings and cash accounts; rents and sales include net revenue from rents and from sales of securities, inventory, or other assets. Finally, the last category includes all other revenue, including from special events such as dinners, raffles, or door-to-door sales of merchandise. Revenues are disaggregated into these categories only for charities which file Form 990, not Form 990-EZ. Eighty-seven percent of social service charities do so, as do 75 percent of environmental charities. Nonprofits with income less than \$100,000 and total assets less than \$250,000 can file Form 990-EZ, though they may file Form 990 if they prefer.
- ⁷ The dip in private donations to environmental charities approximately coincides with the recession in the early 2000s. The fact that a similar dip is not visible in private donations to social service charities may indicate that donations to environmental charities are more income elastic than donations to social service charities.
- ⁸ Khanna and Sandler (2000), Andreoni and Payne (2003), and Payne (1998) use similar instruments.
- ⁹ See www.nber.org/~taxsim.
- ¹⁰ Hendrickson (2005).
- ¹¹ Also, when disaggregating categories of charities, several categories of social service charities which contain fewer observations than the environmental charity data set still provide significant consistent regression results.
- ¹² Simmons and Emanuele (2004) find that government grants crowd out donations of both money and time.

Made available courtesy of the National Tax Association: <http://www.ntanet.org/>

References

Andreoni, James.

Giving with Impure Altruism: Applications to Charity and Ricardian Equivalence. *Journal of Political Economy* 97 (December 1989): 1447-1458.

Towards a Theory of Charitable Fund-Raising. *Journal of Political Economy* 106 (December 1998): 1186-1213.

Andreoni, James, and Abigail Payne. Do Government Grants to Private Charities Crowd Out Giving or Fund-Raising? *American Economic Review* 93 (June 2003): 792-812.

Aldy, Joseph, and Robert Stavins, eds. *Architectures for Agreement: Addressing Global Climate Change in the Post-Kyoto World*. Cambridge: Cambridge University Press, 2007.

Hendrickson, Laura. Coverage of the Endangered Species Act in Four Major Newspapers. *Natural Resources Journal* 45 (Winter 2005): 135-168.

Heutel, Garth. Crowding In and Crowding Out of Private Donations and Government Grants. Cambridge, MA: Harvard University, 2007. Working Paper.

Khanna, Jyoti and Todd Sandler. Partners in Giving: The Crowding-In Effects of UK Government Grants. *European Economic Review* 44 (August 2000): 1543-1556.

Kingma, Bruce. An Accurate Measurement of the Crowd-Out Effect, Income Effect, and Price Effect for Charitable Contributions. *Journal of Political Economy* 97 (October 1989): 1197-1207.

List, John and David Lucking-Reiley. The Effects of Seed Money and Refunds on Charitable Giving:

Experimental Evidence from a University Capital Campaign. *Journal of Political Economy* 110 (February 2002): 215-233.

Payne, Abigail.

Does the Government Crowd-Out Private Donations? New Evidence from a Sample of Non-profit Firms. *Journal of Public Economics* 69 (September 1998): 323-45.

Measuring the Effect of Federal Research Funding on Private Donations at Research Universities: Is Federal Research Funding More than a Substitute for Private Donations? *International Tax and Public Finance* 8 (November 2001): 731-751.

Roberts, Russell. A Positive Model of Private Charity and Public Transfers. *Journal of Political Economy* 92 (February 1984): 136-148.

Rose-Ackerman, Susan. Do Government Grants to Charity Reduce Private Donations? In Susan Rose-Ackerman, ed. *The Economics of Nonprofit Institutions: Studies in Structure and Policy* (Yale Studies on Nonprofit Organizations Series). New York and Oxford: Oxford University Press, 1986, pp. 313-329.

Simmons, Walter and Rosemarie Emanuele. Does Government Spending Crowd Out Donations of Time and Money? *Public Finance Review* 32 (September 2004): 498-511.

Urban Institute. National Center on Charitable Statistics. Washington, D.C. <http://nccs.urban.org>

Warr, Peter. Pareto Optimal Redistribution and Private Charity. *Journal of Public Economics* 19 (October 1982): 131-138.