

Green Giving: An Analysis of Contributions to Major U.S. Environmental Groups

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Abstract

Data are compiled from the tax records of 29 major environmental organizations for the period 1980-1994 to identify factors that influence voluntary contributions. I examine the effects of organizational characteristics, such as fundraising expenditures and alternative sources of revenue, along with the impact of general economic conditions and the political climate. I find that government grants to the organizations had a positive and statistically significant impact on voluntary contributions rather than a crowding out effect. Contributions were price inelastic, where the price is defined as the effective cost to the donor of achieving a one-dollar increase in the provision of program services. Resources devoted to fundraising had a strong and positive impact on donations, suggesting that the environmental organizations fell short of maximizing both total and net revenues. Contributions were also affected by factors largely outside of the organizations' control. Increases in the unemployment rate were associated with reductions in giving, while donations are shown to be greater in years when a Republican President was in office.

Key Words: charitable giving, conservation, crowding out, environmental quality, fundraising, nonprofit organizations, public goods

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I. INTRODUCTION

Consumers of environmental quality, those who perceive benefits from clean air, ecosystem protection, and similar collective goods, can increase its provision by donating funding to various nonprofit organizations. According to one estimate, U.S. charitable giving for environmental and wildlife causes grew by 7.6 % in 1994, to \$3.53 billion (*Giving USA*, 1995). These voluntary contributions supplement the funding provided to environmental organizations by federal, state and local governments, but little is known about whether the two sources of support, private and public, serve as substitutes or complements to one another. Specifically, do grants by government agencies to environmental groups tend to crowd out charitable giving, or do they encourage it? Similarly, there seems to be little systematic evidence on how donations to the typical environmental group are affected by other factors, such as downturns in the economy or the amount of spending diverted into fundraising activities by the organizations.²

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² Boerner and Kallery (1995) consider a factor not examined in this study, how support for an organization is affected by the scope of activities in which it engages, as well its perceived credibility. They offer evidence from a recent case study of five major environmental organizations to support their hypothesis that the recent downturn in membership and financial growth for four of these groups is due to an "expansion away from (each) organization's core competency" (p. 1) and the resulting inability to effectively manage the increase in the scale and number of activities.

This paper offers insights into these effects by building upon the previous work on charitable giving for health, education, and other types of nonprofits, utilizing similar methods to analyze a unique set of data on donations to U.S. environmental groups. Weisbrod and Dominguez (1986) were the first to use data gathered at the organizational, rather than household, level to estimate a demand-type function for the output of U.S. nonprofit organizations.³ They find that giving responds in predictable ways to measures of price, quality, and advertising expenditures, where price is the cost of providing a unit of output, or program services. In their work, the age of an organization serves as a proxy for quality, while fundraising expenditures represent advertising. Further, they illustrate how determining the effect of additional fundraising on donations reveals information about the groups' apparent objective function, i.e. whether they maximize total or net spending on output. Posnett and Sandler (1989) broaden this framework by examining whether alternative sources of revenue -- government grants and autonomous (nonvoluntary) income -- crowd out giving to charities involved in health, overseas, religious and social welfare issues in the United Kingdom. Khanna, Posnett and Sandler (1995) provide additional evidence by analyzing panel, rather than cross-sectional, data that spans eight years of giving to U.K charities.

These studies test for crowding out as well as hypotheses regarding price elasticities and the organizations' objective functions by including in their analysis data on government grants, output price and total fundraising expenditures. However, macroeconomic conditions, which vary across time but not across organizations, can also be important determinants of charitable

³ Household-level studies of charitable giving include Abrams and Schmitz (1984), Barrett (1991), Jones and Posnett (1991a, 1991b), Kingma (1989) and Schiff (1985).

giving. Examining how period-specific variables, such as the unemployment rate, influence donations to nonprofit organizations requires a panel data set that is sufficiently long and exhibits considerable variation. Similarly, nonfinancial characteristics of nonprofit organizations may play a role in explaining differences in their levels of voluntary support. This motivated the inclusion of an organization's age as an explanatory variable in previous studies, a proxy for quality, reputation or credibility. However, controlling for other intangible factors requires considerable information about each organization and a system for categorizing their differences.

This paper addresses these issues by making use of a data set with two unique and important features. First, the panel extends from 1980-1994, a period during which marginal tax rates and other economic conditions in the U.S. varied considerably. Second, the data pertain to a specific sector of the nonprofit community, major environmental organizations, for which the methods used to achieve their goals vary substantially and are readily observable. For example, many of the environmental advocacy groups expend considerable resources on lobbying efforts to influence legislation, while others concentrate on the regulatory process through the citizen-suit provisions of certain environmental laws. While lobbying has long been used by environmentalists to affect public policy, litigation is a relatively new tactic, employed in the last few decades as a last resort to force compliance with existing regulations (Mitchell, Mertig and Dunlap, 1992, pp. 20-21). As an alternative, some groups use boycotts, demonstrations, and other forms of direct action to influence public opinion and, perhaps, consumer decisions. Others specialize in the outright purchase of land in order to preserve the habitat of rare fauna and flora.

This study examines charitable giving by controlling for these differences in tactics, which vary across organizations but not time, as well as accounting for factors outside of the groups' control. These include not only economic variables but political conditions as well, testing the commonly-held belief that donations to U.S. environmental organizations in a given year depend in part on whether the current President is a Republican or a Democrat. Examining, in a systematic way, how factors such as these affect voluntary support for environmental organizations represents a useful addition to the anecdotal evidence offered to date. In addition, it is worthwhile to consider these factors since failure to control for them could result in misspecification of the econometric model, and the potential for bias, when estimating the effects of other variables on charitable giving.

The data collected for the study are described next, followed by a discussion of methodology in section III. Section IV describes the econometric model, while the results are detailed in V. Section VI concludes.

II. DATA

The primary sources of information upon which this analysis is based are the annual tax returns of the 29 major U.S. environmental organizations listed in **Table 1**. Note that the sample used to generate the results discussed below excludes observations from one particular organization, The Nature Conservancy, for which contributions tend to be of a different nature and magnitude. The Nature Conservancy receives large donations of land which are lumpy, difficult to accurately assess, and result in reported contributions that are almost three times as great as those for the second largest group in the sample.

Table 1
Nonprofit Organizations that Provided Tax Return Data

| | |
|--------------------------------|---|
| Center for Marine Conservation | League of Conservation Voters (The) |
| Chesapeake Bay Foundation | National Audubon Society |
| Clean Water Action | National Parks and Conservation Association |
| Clean Water Fund | National Wildlife Federation |
| Conservation International | National Wildlife Federation Endowment |
| Co-op America Foundation | Natural Resources Defense Council |
| Defenders of Wildlife | Nature Conservancy (The) ¹ |
| Ducks Unlimited | Pesticide Action Network |
| Ducks Unlimited Foundation | Rails-to-Trails Conservancy |
| Earth Island Institute | Rocky Mountain Elk Foundation |
| Environmental Defense Fund | Sierra Club |
| Friends of the Earth | Wilderness Society (The) |
| Greenpeace | Wildlife Forever |
| Inform | World Wildlife Fund |
| Izaak Walton League of America | Zero Population Growth |

¹ Not included in the sample due to differences in the nature and magnitude of their contributions.

Environmental organizations were contacted and asked to supply copies of IRS Form 990 for each year back to 1980.⁴ Some groups returned copies of the form for only the past few years, while others searched through their files to fully comply with my request. The average number of years of data for each organization exceeds seven, providing a total of 214 observations. Nonprofit organizations are only required by law to make available to the public tax records for the previous three years, so the efforts of the vast majority of these groups to locate and Xerox Form 990s for earlier years deserves mention.

⁴ Form 990 for years prior to 1980 does not require nonprofit organizations to disaggregate government grants from other types of support.

Form 990 lists revenues by source and divides expenditures into broad categories: program services, fundraising, and management and general. The tax status of each group is identified as either 501(c)(3), educational or scientific organizations for which donations are fully tax deductible and lobbying expenditures are restricted, or 501(c)(4), social welfare organizations for which contributions are not deductible while no limits are placed on lobbying activities.

For the purposes of the study, total contributions to each organization are defined as the sum of direct and indirect public support, membership dues and special events revenue. Direct public support consists of contributions, gifts, grants and bequests received directly from individuals, trusts, corporations, estates and foundations. Indirect public support refers to contributions generated through solicitation campaigns conducted by federated fundraising agencies or similar organizations, such as the Combined Federal Campaign or United Way. Membership dues and special events revenue include the payment for certain services provided by the groups, such as magazine subscriptions and fundraising dinners (Internal Revenue Service, 1994).

III. METHODOLOGY

The purpose of the study is to test hypotheses regarding the impact of public-sector grants on voluntary contributions, the nature of the organizations' objective functions, and how donors respond to variations in the "price" of giving as well as the tactics employed by the groups and various economic and political conditions. This is achieved by examining how contributions to a typical environmental group are affected by characteristics of that organization and of the particular year in which the contributions are made. The explanatory variables include most of those used in the recent study by Khanna, Posnett and Sandler

(1995)⁵ and by others, as well as some organizational characteristics that apply specifically to environmental groups. I also include a number of variables that are typically thought to affect giving but are largely outside of the organizations' control.

The price of a contribution is formulated as the cost to the donor of achieving a one-dollar increase in the provision of program services, a public good (Weisbrod and Dominguez, 1986). Allocating funding to administrative ("management and general") and fundraising activities reduces the proportion that remains for program services, thereby increasing the price. On the other hand, the income tax deduction associated with charitable giving lowers this price, which is defined as

$$P = (1 - t) / (1 - f - a), \quad (1)$$

where t is the marginal tax rate and f and a indicate the proportions of total expenditures an organization devotes to fundraising and to administrative expenses.

These proportions represent average rather than marginal fractions and their use has been criticized by Steinberg (1986), who argues that the marginal proportions equal zero for small donations. However, both the environmental organizations and the private agencies that rate them typically emphasize these average proportions in their annual reports and other publications,⁶ and it seems plausible that donors would assume, perhaps irrationally, that

⁵ I do not include the RHS variable they refer to as Legacy, a type of giving by long-term covenant that offers special tax advantages in Great Britain.

⁶ See, for example, American Institute of Philanthropy (1995), which reports the "percent spent on charitable purpose" for 28 environmental organizations.

corresponding fractions of their contributions would be devoted to fundraising and administration (Rose-Ackerman, 1982). Moreover, whether donors consider f and a to be equal to zero or to the average proportions is an empirical question.

In addition, a choice must be made regarding the appropriate tax rate, t . For 501(c)(3) organizations, I use the marginal personal income tax rate for the highest tax bracket in a particular year. For 501(c)(4) organizations, I simply use zero since contributions are not tax-deductible. This treatment ignores state and other income taxes and makes the strong implicit assumption that donors to tax-deductible organizations are individuals who have sufficiently high incomes and itemize deductions. As such, t serves merely as a proxy to control for the overall effect of changes in marginal tax rates over time. **Table 2** lists the descriptive statistics for price and its constituent parts as well as the other explanatory variables used in the study. All figures have been converted into 1994 dollars.

Whether alternative (nonvoluntary) sources of income influences giving is tested by including two such categories on the right-hand side. Government grants refer to the public funding awarded to the organizations directly by federal, state and local agencies to help support various programs. Other revenue is the sum of income from short- and long-term investments, the sale of assets and merchandise, rents, program service revenues, and miscellaneous income. Note that information on government grants and other revenue, as well as the proportion of spending used for fundraising and management, is typically not available to donors until the following year, when annual reports and financial statements are released. Therefore, these variables are lagged one period.

Table 2. Sample Means, Standard Deviations, and Minimum and Maximum Values

| Variable | Mean | Standard Deviation | Minimum Value | Maximum Value |
|--|------------|--------------------|---------------|---------------|
| <i>Dependent Variable:</i> | | | | |
| Contributions [\$] | 14,185,000 | 16,457,000 | 0 | 67,110,000 |
| <i>Explanatory Variables:</i> | | | | |
| Price = $(1-t)/(1-f^L - a^L)$ [\$] | 0.8936 | 0.2326 | 0.4089 | 1.5700 |
| [t = Tax Rate | 0.3551 | 0.0848 | 0.2800 | 0.7000] |
| [f ^L = Fundraising ^L / Total Expenses ^L | 0.1240 | 0.0760 | 0 | 0.3345] |
| [a ^L = Administrat. ^L / Total Expenses ^L | 0.1042 | 0.0648 | 0 | 0.4072] |
| Government Grants ^L [\$] | 532,820 | 1,500,800 | 0 | 11,940,000 |
| Other Revenue ^L [\$] | 3,385,700 | 6,373,600 | -26,680 | 31,250,000 |
| Fundraising Expenses [\$] | 2,293,100 | 3,122,400 | 0 | 14,640,000 |
| Age of Organization | 33.0430 | 26.8690 | 1 | 101 |
| Lobbying | 0.6162 | 0.4876 | 0 | 1 |
| Litigation | 0.5676 | 0.4968 | 0 | 1 |
| Land/Habitat Acquisition | 0.2703 | 0.4453 | 0 | 1 |
| Direct Action/Boycotts/ Demonstrations | 0.2000 | 0.4011 | 0 | 1 |
| Unemployment Rate | 0.0651 | 0.0092 | 0.0530 | 0.0970 |
| Republican President | 0.8162 | 0.3884 | 0 | 1 |

(All amounts are converted to 1994 dollars)

^L lagged value

Though fundraising activities may reduce contributions as they raise the price of program services, they also *increase* contributions by publicizing the organization and its specific programs. Total fundraising expenditures are included to estimate the effectiveness of these marketing-like activities. In contrast to previous studies,⁷ I use current rather than lagged fundraising expenditures as an explanatory variable. This is motivated by the nature of successful fundraising activities in this area, such as the extensive use of direct mail, which suggests that donors typically do not wait until the following year to respond to the marketing activities of environmental organizations. As in other studies, the age of the organization is included as a proxy for name recognition or credibility.

As noted in the introduction, environmental organizations typically differentiate themselves by the methods they employ in order to achieve their goals. Dummy variables for four categories of activities are used to control for their possible effects on donations: (1) lobbying, (2) litigation, (3) land/habitat acquisition, and (4) direct action, boycotts or demonstrations. Lobbying expenditures are reported in the tax forms, whereas information on participation in other activities came from the 1992-93 edition of *Public Interest Profiles*, published by Congressional Quarterly. Profiles are reported for the majority of groups in the sample, and are based on responses to a survey that was later followed up with an opportunity for each group to review and make corrections before it went to press (Congressional Quarterly, 1992-93, pp. xvii-xviii). In the few cases where profiles for an organization were not published, the dummy variables were coded by examining the group's annual reports and tax records.

⁷ Khanna, Posnett and Sandler (1995) and Weisbrod and Dominguez (1986) used lagged fundraising expenditures in their models.

The unemployment rate was included as a proxy for economic conditions. In addition, giving to environmental organizations in particular is thought to be motivated by the fear of worsening environmental quality (Mitchell, 1979). Since protection of the environment is so closely tied to the enactment and enforcement of federal laws and regulations, the perceived threat of loss may be highly correlated with the ideology of the Presidential administration. A dummy variable for the party affiliation of the current U.S. President is therefore included to test whether contributions seem to be affected by the perceived ideology of the executive branch, insofar as perceptions are influenced by mere party affiliation.

IV. EMPIRICAL SPECIFICATION

Since the panel is neither balanced nor, for a few organizations, contiguous, the model must be specified as either pooled, fixed-effects, or random effects.

Pooled Model

The pooled model uses ordinary least squares to estimate equation (2) below. GG , OR and FE indicate government grants, other revenue, and fundraising expenditures, while i and t are organization and period subscripts.

$$\begin{aligned}
 Contributions_{it} = & a + b_1 Price_{i,t-1} + b_2 GG_{i,t-1} + b_3 (GG_{i,t-1})^2 & (2) \\
 & + b_4 OR_{i,t-1} + b_5 (OR_{i,t-1})^2 + b_6 FE_{it} + b_7 (FE_{it})^2 \\
 & + b_8 (GG_{i,t-1})(OR_{i,t-1}) + b_9 (GG_{i,t-1})(FE_{it}) + b_{10} (OR_{i,t-1})(FE_{it}) \\
 & + b_{11} Age_{it} + b_{12} (Age_{it})^2 + b_{13} (Lobbying_i) + b_{14} (Litigation_i) \\
 & + b_{15} (Land/Habitat Acq_i) + b_{16} (Direct Action/Boycotts/Demonstrations_i) \\
 & + b_{17} (Unemployment Rate_t) + b_{18} (Republican President_t) + \epsilon_{it} ,
 \end{aligned}$$

where $E[e_{it}] = 0$ and $E[e_{it}^2] = \sigma_e^2$. Note that square terms are included for government grants, other revenue, fundraising and age to account for any nonlinearity⁸. Also, $(GG_{i,t-1})(OR_{i,t-1})$, $(GG_{i,t-1})(FE_{it})$, and $(OR_{i,t-1})(FE_{it})$ are included to control for possible interactions.

Fixed-Effects Model

In the fixed-effects model, the intercept term is specific to each organization in the sample. The description of this (and the random-effects) model follow Greene (1993, pp. 465-470), where the RHS variables detailed in (2) above are grouped for convenience in matrix form. For the fixed-effects model,

$$Contributions_{it} = a_i + \mathbf{b}'\mathbf{x}_{it} + e_{it}, \tag{3}$$

where, as before, $E[e_{it}] = 0$ and $E[e_{it}^2] = \sigma_e^2$.

Random-Effects Model

In the model of random-effects, the intercept term is common to all organizations as it is in the pooled model. However, an organization-specific disturbance, u_i , is added to the regression equation, or

$$Contributions_{it} = a + \mathbf{b}'\mathbf{x}_{it} + u_i + e_{it}, \tag{4}$$

where $E[\varepsilon_{it}] = E[u_i] = 0$, $E[\varepsilon_{it}^2] = \sigma_e^2$, and $E[u_i^2] = \sigma_u^2$. In addition, $E[\varepsilon_{it} u_j] = 0$ for all i, t , and j , $E[\varepsilon_{it} \varepsilon_{js}] = 0$ if $t \neq s$ or $i \neq j$, and $E[u_i u_j] = 0$ if $i \neq j$.

⁸ A log-linear specification was also attempted, but was rejected due to poor fit.

The choice of models is simplified by the fact that one of the three described above, fixed-effects, cannot be estimated if one or more of the explanatory variables are time-invariant (Greene, 1995, p. 475). In this case, the dummy variables used to control for the methods of each organization -- lobbying, litigation, etc. -- are identical across periods for each group. Estimation is therefore prevented due to their perfect collinearity with each organization's fixed effect, α_i .

V. RESULTS

Table 3 presents the results for the pooled model, (1), and the random-effects model, (2). Breusch and Pagan's Lagrange multiplier test, based on the OLS residuals, is used to choose the most appropriate model. The low value of the test statistic ($LM=2.677$) indicates that one cannot reject the null hypothesis that the organization-specific disturbances are identical (i.e. $H_0: \sigma_u^2 = 0$). Therefore, the pooled model is preferable.

Various specifications of the basic specification were run to examine the robustness of the parameter estimates. The results for a few of these variations are shown in **Table 4**. In model (3), the interaction terms that lacked statistical significance are excluded from the RHS, while the statistically-insignificant method dummies are excluded in model (4). Model (5) excludes both, while model (6) is a specification that will be of particular interest below. Given the absence of major differences in the magnitude of the coefficients or their statistical significance, I focus on the results for model (3), where only the statistically-insignificant interaction terms are excluded. The justification is that these terms were originally included merely to control for their possible effects, while inclusion of the dummy variables is intended to test the hypothesis that the methods employed by the organizations have a noticeable effect

Table 3. Parameter Estimates (T-Ratios): Initial Model (Dependent Variable is Contributions)

| Variable | (1) <i>Pooled Model</i> | (2) <i>Random-Effects Model</i> |
|---|-----------------------------|---------------------------------|
| Constant | 6,904,500 (2.342) ** | 6,803,300 (2.260) ** |
| Price | -4,847,100 (-2.995) *** | -4,655,500 (-2.725) *** |
| Government Grants | 3.1999 (3.916) *** | 3.1435 (3.829) *** |
| G. G. Squared | -0.101 e-6 (-1.575) | -0.910 e-7 (-1.442) |
| Other Revenue | 1.0384 (4.195) *** | 1.0051 (3.688) *** |
| O. R. Squared | 0.173 e-7 (2.090) ** | 0.196 e-7 (2.192) ** |
| Fundraising Expend's | 5.1783 (12.909) *** | 5.0827 (11.869) *** |
| F. E. Squared | -0.955 e-7 (-2.801) *** | -0.835 e-7 (-2.304) ** |
| (G. G.)(O. R.) | -0.759 e-7 (-0.698) | -0.400 e-7 (-0.367) |
| (G. G.)(F. E.) | -0.735 e-7 (-1.033) | -0.121 e-6 (-1.676) * |
| (O. R.)(F. E.) | -0.152 e-6 (-4.055) *** | -0.166 e-6 (-4.463) *** |
| Age of Organization | 157,250 (3.015) *** | 183,080 (3.145) *** |
| Age Squared | -1,498 (-2.531) ** | -1,616 (-2.489) ** |
| Lobbying | -961,130 (-0.962) | -1,217,700 (-1.079) |
| Litigation | -176,320 (-0.191) | -330,010 (-0.313) |
| Land/Habitat | 3,248,600 (4.018) *** | 3,543,100 (3.774) *** |
| Acquisition | 832,690 (1.075) | 847,700 (0.949) |
| Direct Action/Boycotts/ Demonstrations | -88,211,000 (-2.838) *** | -92,171,000 (-3.031) *** |
| Unemployment Rate | 1,502,400 (2.164) ** | 1,473,400 (2.152) ** |
| Republican President | | |
| F-Test Stat. (Prob.) | 211 (0.2 e-103) | ? |
| Adjusted R-Squared | 0.9536 | ? |

*, ** and *** indicate statistical significance at the 10%, 5% and 1% levels

Table 4. Parameter Estimates (T-Ratios): Alternative Models (Dependent Variable is Contributions)

| Variable | (3) Pooled | (4) Pooled | (5) Pooled | (6) Pooled |
|---|-----------------------------|-----------------------------|----------------------------|----------------------------|
| Constant | 6,934,200 (2.352) ** | 6,219,400 (2.192) ** | 6,170,100 (2.169) ** | 6,177,800 (2.107) ** |
| Price | -5,019,300 (-3.110) *** | -4,523,300 (-3.040) *** | -4,640,200 (-3.111) *** | |
| Government Grants | 2.4283 (3.819) *** | 3.5415 (4.434) *** | 2.6747 (4.295) *** | 2.5485 (4.007) *** |
| G. G. Squared | -0.114 e-6 (-1.851) * | -0.117 e-6 (-1.854) * | -0.132 e-6 (-2.199) ** | -0.121 e-6 (-1.973) * |
| Other Revenue | 1.0174 (4.283) *** | 1.1553 (4.852) *** | 1.1388 (4.973) *** | 1.0634 (4.491) *** |
| O. R. Squared | 0.199 e-7 (2.560) ** | 0.137 e-7 (1.716) * | 0.163 e-7 (2.188) ** | 0.159 e-7 (2.092) ** |
| Fundraising Expend's | 5.3542 (13.946) *** | 4.9993 (13.294) *** | 5.2031 (14.649) *** | 5.1618 (14.252) *** |
| F. E. Squared | -0.116 e-6 (-3.829) *** | -0.819 e-7 (-2.487) ** | -0.105 e-6 (-3.717) *** | -0.115 e-6 (-3.802) *** |
| (G. G.)(O. R.) | | -0.890 e-7 (-0.828) | | |
| (G. G.)(F. E.) | | -0.814 e-7 (-1.177) | | |
| (O. R.)(F. E.) | -0.165 e-6 (-4.504) *** | -0.153 e-6 (-4.071) *** | -0.168 e-6 (-4.566) *** | -0.152 e-6 (-4.153) *** |
| Age of Organization | 142,150 (2.774) *** | 135,850 (2.719) *** | 116,980 (2.395) ** | 188,720 (3.992) *** |
| Age Squared | -1,348.2 (-2.318) ** | -1,393.3 (-2.443) ** | -1,212.2 (-2.170) ** | -1,862.8 (-3.499) *** |
| Lobbying | -930,140 (-0.946) | | | -1,535,800 (-1.608) |
| Litigation | -226,880 (-0.247) | | | 617,180 (0.724) |
| Land/Habitat | 3,178,800 (3.945) *** | 3,443,500 (4.309) *** | 3,376,200 (4.232) *** | 3,511,600 (4.423) *** |
| Acquisition | | | | |
| Direct Action/Boycotts/ Demonstrations | 1,006,200 (1.333) | | | 601,270 (0.811) |
| Unemployment Rate | -84,255,000 (-2.723) *** | -84,093,000 (-2.717) *** | -78,634,000 (-2.548) ** | -83,526,000 (-2.254) ** |
| Republican President | 1,590,300 (2.298) ** | 1,510,100 (2.195) ** | 1,600,000 (2.331) ** | 1,842,100 (2.575) ** |
| Price (w/o Tax Rate) | | | | 5,509,300 (-2.870) *** |
| Marginal Tax Rate | | | | 7,756,000 (1.837) * |
| F-Test Stat. (Prob.) | 237 (0.3 e-105) | 252 (?) | 289 (?) | 223 (?) |
| Adjusted R-Squared | 0.9535 | 0.9534 | 0.9531 | 0.9534 |

on contributions. I discuss the results for each set of RHS variables below, including estimates of elasticities and other effects.

Price

The price, or cost of achieving a one-dollar increase in the provision of program services, has a statistically significant but minor affect on contributions for organizations in this sample. Each one-cent increase reduces donations by an average of \$50,193 (in 1994 dollars), yielding an elasticity of -0.27 when evaluated at the means of the sample. In addition, the effect of increased fundraising and/or administrative expenditures can be assessed by examining their impact on price and, therefore, on contributions. At the means, a one-percentage-point increase in the proportion spent on fundraising or on administrative expenses reduces voluntary giving by \$54,337 for the average organization in the average year. This corresponds to a 0.2% drop. Note that since the proportions spent on fundraising and on administrative expenditures are assumed to enter the price formula additively, their effects on contributions cannot be differentiated. Also, though fundraising may reduce contributions by increasing price, it also *increases* giving by providing information to donors, as shown below.

It is unclear from this specification of the model whether the effect that price is shown to have on donations is due to the impact of changes in the tax rate or changes in fundraising and administrative expenditures. To examine this issue more closely, consider the results for model (6) in Table 4. This specification is identical to that for model (3) except that price has been replaced by two of its components. The first is a measure of price calculated without the tax (i.e. $t = 0$), and the second is simply the tax rate itself. The finding that the estimated

coefficient for each is both statistically significant and of the expected sign provides some evidence that the price effect is caused both by changes in fundraising and administrative expenses and by variations in marginal tax rates. This supports Rose-Ackerman's (1982) hypothesis that donor behavior exhibits the "plausible irrationality" of mistaking *average* proportions of fundraising and administrative expenditures for *marginal* ones.

Alternative Sources of Revenue

Both government grants and other (nonvoluntary) sources of revenue are shown to have large and statistically-significant effects on contributions. Both variables are characterized by nonlinear relationships to donations, with a positive but diminishing impact for government grants and a positive and increasing effect for other revenue. Since each variable effects donations both directly and through its squared term, the effects of a one-unit change must be calculated by differentiating equation (2) with respect to the RHS variable and evaluating at the means. These marginal effects are listed in **Table 5** which shows, for example, that an additional dollar in government grants was associated with a \$2.31 increase in giving for the typical organization.

Fundraising Expenditures and Age of the Organization

Similarly, the quadratic specification for the effects of fundraising expenditures and age indicate positive but diminishing impacts on contributions. An additional dollar spent on fundraising increases contributions by \$4.27, evaluated at the means. Stated another way, a *one-percentage-point* increase in expenditures devoted to fundraising (e.g. from 12% to 13%) is associated with a \$786,608 rise in contributions, other things equal. This increase in

Table 5. Parameter Estimates (T-Ratios) and Marginal Effects (Dependent Variable is Contributions)

| Variable | (3) Pooled | (3) Marginal Effects | (7) Pooled | (8) Random Effects |
|---|-----------------------------|----------------------|----------------------------|----------------------------|
| Constant | 6,934,200 (2.352) ** | | 5,538,000 (2.067) ** | -5,584,300 (2.536) ** |
| Price | -5,019,300 (-3.110) *** | -5,019,300 | | |
| Price (w/o tax rate) | | | -5,145,700 (-2.563) ** | -5,213,000 (-3.200) *** |
| Government Grants | 2.4283 (3.819) *** | 2.31 | 3.3839 (5.233) *** | 3.1548 (5.988) *** |
| G. G. Squared | -0.114 e-6 (-1.851) * | | -0.191 e-6 (-3.005) *** | -0.177 e-6 (-3.457) *** |
| Other Revenue | 1.0174 (4.283) *** | 0.77 | 1.3506 (5.639) *** | 1.3757 (6.667) *** |
| O. R. Squared | 0.199 e-7 (2.560) ** | | 0.102 e-7 (1.285) | 0.104 e-7 (1.538) |
| Fundraising Expend's | 5.3542 (13.946) *** | 4.27 | 4.8851 (13.874) *** | 4.8610 (16.240) *** |
| F. E. Squared | -0.116 e-6 (-3.829) *** | | -0.930 e-7 (-3.130) *** | -0.886 e-7 (-3.516) *** |
| (O. R.)(F. E.) | -0.165 e-6 (-4.504) *** | | -0.147 e-6 (-3.833) *** | -0.156 e-6 (-5.047) *** |
| Age of Organization | 142,150 (2.774) *** | 53,053 | 151,020 (3.172) *** | 154,600 (3.738) *** |
| Age Squared | -1,348.2 (-2.318) ** | | -1,873.9 (-3.380) *** | -1,880.5 (-3.926) *** |
| Lobbying | -930,140 (-0.946) | | | |
| Litigation | -226,880 (-0.247) | | | |
| Land/Habitat Acquisition | 3,178,800 (3.945) *** | 3,178,800 | | |
| Direct Action/Boycotts/ Demonstrations | 1,006,200 (1.333) | | | |
| Unemployment Rate | -84,255,000 (-2.723) *** | -84,225,000 | | |
| Republican President | 1,590,300 (2.298) ** | 1,590,300 | | |
| F-Test Stat. (Prob.) | 237 (0.3 e-105) | | | |
| Adjusted R-Squared | 0.9535 | | | |

contributions is slightly offset, however, by the effect of increased fundraising on price considered above. Combining both effects yields a \$732,271 impact on contributions, a 5.2% increase for the average organization. A one-year increase in age, on the other hand, raises donations to the representative organization by only about \$50,000.

Methods Employed by the Organizations

The only method of the four considered that is found to have a statistically significant effect is land/habitat acquisition. Contributions for organizations engaging in this activity tend to be over \$3 million greater on average, other things equal. However, an F-test can be used to evaluate the *joint* significance of the four method variables. The high value of the test statistic ($F[4,169] = 4.58$) rejects the null hypothesis of no joint effect at a 1% level of significance.

Economic and Political Conditions

Note that the unemployment rate, used as a proxy for the state of the macroeconomy, is measured as a proportion, not a percent, of the labor force. Therefore, a one-percentage-point increase in the unemployment rate is found to reduce contributions by an average of \$842,250. As for the effect of political conditions, average donations tended to be about \$1.5 million higher in years when a Republican President was in office. Note that the President in office was Republican for all of the years in the sample except 1993 and 1994. Further evidence on this effect, generated as data for additional years becomes available, will either confirm or refute this finding.

The Joint Significance of the Period-Characteristics and Method Dummies

Previous studies examining charitable giving at the organizational level (Khanna, Posnett and Sandler, 1995, Posnett and Sandler, 1989, and Weisbrod and Dominguez, 1986) do not take account of period-specific effects on giving due to the limited number of years in their data sets.⁹ Similarly, the wide range and large number of nonprofit organizations they examine makes it impractical to attempt to characterize, and test the effects of, the methods used by the various groups to achieve their goals¹⁰. The importance of these factors are tested by excluding from model (3) the period-specific effects, i.e. the marginal tax rate incorporated into the price, the unemployment rate and the President's party affiliation, as well as the method dummies. In contrast to the linear or loglinear models used in other studies, the quadratic specification is retained here. The results for the pooled and random-effects models are shown in the last two columns of Table 5. The large and significant Lagrange multiplier test statistic (LM=7.40714) indicates that the random-effects model is preferable in this case.¹¹

Two questions regarding the comparison between model (3) and models (7) and (8) are of particular interest. The first is whether the period-specific and method-indicating dummy variables are jointly significant in explaining the variation in contributions across time and organizations. An F-test indicates that they are, rejecting the null hypothesis of no joint effect at

⁹ The longest panel is the 1983-1990 data for U.K. charities examined by Khanna, Posnett and Sandler (1995). Posnett and Sandler (1989) examine a cross section of U.K. charities for the year 1985/1986, while Weisbrod and Dominguez (1986) employ the average values for the four-year period 1973-76 in their study of U.S. nonprofit organizations.

¹⁰ These studies do, however, disaggregate their data set by types of charity, e.g. social welfare, religious, or health, and present separate results for each type.

the 0.0001 level of significance, ($F[6,169] = 5.08184$). The second question is whether the exclusion of these variables affects the parameter estimates for price, government grants and other factors. As shown in Table 5, the signs of the coefficients are the same for each model, and every variable that is statistically-significant in models (7) and (8) is significant as well in model (3), with the exception of other revenue squared. Furthermore, the magnitudes of the parameter estimates are roughly similar, the most notable exceptions being government grants, for which the coefficient is 39% greater in model (7) than in model (3), and other revenue, for which the coefficient is 33% greater. This suggests that although the time-specific variables and method dummies are statistically-significant determinants of charitable giving, excluding them in this type of study has, fortunately, only a minor effect on the estimates of other parameters.

VI. CONCLUSION

Previous empirical work on charitable giving to nonprofit groups has focused on three issues. These include the hypotheses that (1) public funding for an organization's programs tends to crowd out private giving, (2) donors are responsive to changes in the effective price of giving, and (3) nonprofit groups maximize total (or net) revenues. This study presents new evidence regarding each of these by examining charitable giving to major U.S. environmental organizations over the preceding decade and a half.

Posnett and Sandler (1989) find that government grants have no significant impact on private donations to U.K. charities, while the effect that Khanna, Posnett and Sandler (1995)

¹¹ The fixed-effects model was run also since the time-invariant method dummies are not included in this specification. However, the Hausman test easily rejects the fixed-effects model in favor of random-effects, so the results are not reported here.

observe is positive and statistically significant, though small. I, too, find that government grants tend to increase, rather than reduce, voluntary contributions. The relationship is positive but decreasing, with an extra dollar of public funding raising contributions by more than \$2.00 when evaluated at the sample mean. This may indicate that donors consider government grants to be complementary to their own contributions, not a substitute source of funding. Perhaps they perceive that public funding is, in some sense, matching their private gifts. Alternatively, donors may see government grants as an indicator of an organization's quality or effectiveness.

Like similar studies, I find donations to be responsive to output price, though relatively inelastic. However, U.S. environmental organizations do not appear to maximize total revenue, as Weisbrod and Dominguez (1986) found for various types of U.S. charities, or even net revenue, as Posnett and Sandler (1989) found for charities in the U.K. Rather, U.S. environmental groups appear to spend too little on fundraising activities to be characterized as maximizing either of these objective functions. This result is similar to the case of social welfare charities examined by Khanna, Posnett and Sandler (1995).

Furthermore, the unique data set collected for this study permits the examination of a number of other factors which are commonly thought to influence charitable giving. These include the methods undertaken by each organization in order to achieve their stated goals as well as political and economic variables that are outside of the organizations' control. Donations are shown to be significantly higher for groups that engage in land and habitat acquisition, and are affected in a predictable way by changes in the unemployment rate. The political climate seems to be important as well since contributions are found to be greater in

years when a Republican president is in office.

Possibilities abound for further research in this area. For example, the finding that organizations in the sample did not appear to maximize total or net contributions suggests that other objectives may underlie their behavior. Perhaps these organizations have some interest in maximizing membership size rather than revenue, since political clout is often associated with the ability to mobilize a large number of voters on important issues. Alternatively, extending the sample to include smaller organizations or upcoming periods might yield results that are quite different from those presented here. This would enable one to examine whether donations to regional or single-issue organizations respond differently to changes in the factors that explain giving to the major groups. Similarly, one might test the effect on contributions of additional political variables, such as the presence of a Republican-majority Congress.

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