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Does the government crowd-out private donations? New evidence from a sample of non-profit firms

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Abstract

During the 1980s, government grants to non-profit organizations declined dramatically and the price of private donations increased. Given there are different costs associated with government grants and private donations to non-profits, it is important to study the relationship between these two sources and determine whether government grants 'crowd-out' private donations. I take a fresh look at the issue of crowd-out and improve upon the literature by exploiting a panel data set that links private donations to non-profit firms with the government grants they received. I study 430 non-profit shelter, human services, and other similar types of organizations that were in operation between 1982 and 1992. I find private donations to these non-profits effectively do not change with changes in government grants after controlling for firm heterogeneity and political and economic factors under an OLS specification. In a 2SLS specification, after controlling for possible endogeneity of the government grants the estimated crowd-out is significantly different from zero and one dollar; on average, the estimated crowd-out is ~50 cents. © 1998 Elsevier Science S.A.

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1. Introduction

Salamon (1990) has estimated that non-profit organizations are responsible for more than 50% of social services provided in the United States. With the impetus

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of governments to reduce the amount of funding and direct provision of social services, the role of non-profits in the provision of such goods has become increasingly important. A significant portion of the non-profit industry's revenues (total revenues of non-profits represented over 7% of the United States gross domestic product — or $400 billion — in 1990) comes from private donations and government funding. This raises an important question of how private donors react to changes in government funding of non-profit activity. Clearly, there are different views on this issue. Most of the studies of the relationship between private and public donations focus on measuring the impact of increased (or decreased) government provision on private donations — the so-called 'crowd-out effect'. Under some strong assumptions (e.g. that donors are purely altruistic, caring only about the total provision of a charitable good), crowd-out should be one for one (Warr, 1983). This means that a dollar increase in government funding decreases private donations by a dollar.[1]

Another issue that arises in the relationship between private and public donations to non-profit organizations concerns the efficiency and distributional consequences between the financing of charitable goods through direct taxation or a subsidy to private spending. Roberts (1987) shows that efficiency depends on the price elasticity of private spending and the trade-off between public and private spending. If complete crowd-out exists, Roberts (1987) suggests government spending should be eliminated unless the optimal level of expenditures greatly exceeds the current level of donations.

I take a fresh look at this issue and improve upon the literature by exploiting a unique data source. I use a panel data set that links private donations to non-profit firms with the government grants they received. It covers 430 non-profit shelter, human services, and other similar organizations that were in operation between 1982 and 1992. In addition to studying this issue at the non-profit level, I recognize that public as well as private action is purposeful. Thus, I use a model in which equilibrium levels of public and private provision of charitable goods are simultaneously influenced by individuals insofar as I recognize donors are also voters and thereby influence government policy.

I test whether government grants given to non-profits crowd out private donations after controlling for firm heterogeneity, macro shocks, political and economic effects, and potential endogeneity. My results suggest crowd-out may exist but, if it does, is partial and not dollar for dollar. For the average non-profit organization, after controlling for heterogeneity in the non-profits' provision of services, possible endogeneity of the government grants, as well as the political and economic status of the states in which the non-profit is located, the results suggest an additional dollar of government spending on charitable goods effectively does not change private donations under an OLS specification. Under a 2SLS

[1]Of course, the public contributions indirectly represent a private donation as the government contributions are funded through the collection of taxes.

specification, the change in private donations is significantly different from zero and negative one; on average, the 2SLS specification suggests a decline in private donations by approximately 50 cents.

Earlier research focuses on a very broad definition of crowd-out due to limitations in the data that were available. Because most of the data on private donations are at the individual taxpayer level, the types of charitable goods towards which the donations are made cannot be specifically identified. Also, government expenditures for the private provision of these goods cannot be accurately measured. From a policy standpoint, we should be interested in addressing, for a given type of charitable good, how private donations for that good vary when government grants for that good change.

There are five main advantages in measuring crowd-out using panel data available at the non-profit level. Firstly, we can closely match information on actual private donations to non-profit organizations with information on government grants given to the same non-profit organizations. Secondly, we can identify the type of charitable good provided by the non-profit, and, thus, isolate the donations to those concerned with charitable goods that are supported by the government. Thirdly, by knowing the state in which the non-profits are located, we can use measures to reflect voter attitudes that affect both donations and government expenditures. Fourthly, using firm level fixed effects allows us to control for heterogeneity across non-profit firms, thereby recognizing that a donor's decision to donate is affected by the non-profit that produces the charitable good sought. And, fifthly, the data also permit us to address the effect of government funding to other non-profits within a state and the effect of direct transfers by the government to individuals that might mitigate (or enhance) the need for the services provided by the non-profits.

This paper proceeds as follows: Section 2 develops the theory underlying the relationship between private and government donations. Section 3 explains how I created the data set. Section 4 discusses the results from earlier studies. Section 5 presents the empirical model for measuring crowd-out and my estimates of crowd-out under this model. Section 6 provides a brief conclusion.

2. Theory

There are three principal players in the model: individuals,[2] the government, and non-profit firms. Individuals and the government determine the demand for, and the firm produces, the charitable good. Individuals also influence government policy as voters. As with previous theoretical work, I use an individual's utility function to derive a demand function for the charitable good (Schiff, 1985; Kingma, 1989). Crowd-out is a function of the reason why individuals derive

[2]The term individuals also covers corporations and other types of organizations.

utility from the provision of charitable goods.[3] At one extreme, if donors derive utility solely from the provision of the charitable good ('altruistic behavior'), regardless of the source of funding, Warr (1983), Roberts (1984) and Bernheim (1986) show a dollar increase in government spending on a charitable good should result in a dollar decrease in donations ('complete crowd-out'). This is because the increase in government expenditures, financed by taxing the donors, acts just like a redistribution of income. At the other extreme, if donors derive utility solely from the charitable donation ('egoistic behavior'), then a dollar increase in government spending has no crowd-out effect on private donations. If individuals possess altruistic and egoistic characteristics, then the crowd-out effect is partial, ranging between $(0, -1)$ (Cornes and Sandler, 1984; Schiff, 1985; Steinberg, 1987; Andreoni, 1990).[4]

The framework developed by Andreoni (1990) encompasses pure altruism and pure egoism. I extend Andreoni's analysis to reflect that several firms produce the charitable good and that individuals behave as voters as well as donors. I assume there are J heterogeneous non-profits that produce the charitable good. The firm's production of the charitable good is, therefore, a function of donations and other characteristics:

$$Q = (Q_1, Q_2, \ldots, Q_J), \tag{1}$$

$$Q_j = q(D_{ij} + R_{-ij} + G_j, \theta_j) \tag{2}$$

where Q is the vector of production functions for the J firms, D_{ij} is the donation of individual i to firm j, R_{-ij} is the sum of the contributions of other private donors to firm j, G_j is the government grant to firm j, and θ_j represents the vector of characteristics that distinguishes firm j from the other firms in its provision of the charitable good. Theta includes such things as cost and product differentiation, the firm's location, and other aspects which may affect a donor's decision to donate to that firm.

Individual i maximizes her consumption of private goods and donations to the charitable good under the following utility function:

$$U_i(X_i, D_{i.}, Q) \tag{3}$$

subject to:

[3] Sugden (1982) and Rose-Ackerman (1981) present analyses suggesting a 'crowd-in' effect whereby an increase in government expenditures results in an increase in private donations, which would extend the crowd-out range from 1 to -1. Among other reasons, there is an expectation of crowd-in if the government's donations serve as a signal of the quality of the charitable good provided by the non-profit firm or if the production of the charitable good is under increasing returns to scale.

[4] Alternatively, Bergstrom et al. (1986) have shown if donors are treated as a group separate from non-donors, then an increase in government expenditures for charitable goods, funded by a redistribution of income across both donors and non-donors, will result in only a partial crowd-out effect.

$$
\begin{aligned}
&Y_i = X_i + d_{i.},\\
&D_{i.} = (D_{i1}, D_{i2}, \ldots, D_{iJ}),\ d_{i.} = \sum_j D_{ij},\\
&D_{ij} \geq 0 \text{ for all } j,\ X_i \geq 0,\\
&G = (G_1, G_2, \ldots, G_J)
\end{aligned}
\tag{4}
$$

where X_i is the consumption of private goods, D_i is the vector of donations by individual i to the J non-profit firms, Y_i is individual i's income (net of taxes), and G is the vector of government expenditures to all non-profits providing the charitable good. The utility function is assumed to be strictly quasi-concave and twice differentiable. Individual i's donation enters the utility function twice, once as part of the charitable good, Q, and again as a separate donation, D_i, capturing the fact the donation has properties separate from those representing the charitable good. The egoistic component of the donation is captured by D_i in U_i and the altruistic component is captured by Q.

I assume a three stage process. Firstly, the government sets G, the amount it contributes to a charitable good through some political voting process. Secondly, individuals, taking G and the donations of other individuals as given, determine their donation to a given firm by maximizing their utility functions. Thirdly, the firms receive the private and public donations and then supply the charitable good. Because firms are treated as passive players, we only need to examine the first two stages. Solving backward, in stage two, by substituting Eq. (2) and Eq. (4) into Eq. (3), individual i determines her donations to the non-profits by maximizing:

$$
\max_{D_{i\cdot}} U_i(Y_i - d_{i.}, D_{i.}, q(D_{i1} + R_{-i1} + G_1, \theta_1), \ldots, (D_{iJ} + R_{-iJ} + G_J, \theta_J)) \tag{5}
$$

Differentiating with respect to D_{ij} and solving yields a vector of donation functions, γ, one for each non-profit, by each donor that takes as arguments the individual's income, donations of others,

$$
\begin{aligned}
&D_{ij} = \gamma^{ij}(Y_i, R_{-i}, G, \theta),\\
&R_{-i} = (R_{-i1}, R_{-i2}, \ldots, R_{iJ})
\end{aligned}
\tag{6}
$$

government expenditures, and the characteristics of the firms. Because R_{-i} represents the donations of other individuals, if we solve the set of donations functions across the I individuals, then γ may be expressed as a vector of functions, δ:

$$
\begin{aligned}
&D_{ij} = \delta^{ij}(Y, G, \theta),\\
&\delta^{i\cdot} = (\delta^{i1}, \delta^{i2}, \ldots, \delta^{iJ})
\end{aligned}
\tag{7}
$$

where Y represents the vector of incomes for all individuals. The demand for donations toward the charitable good as provided by firm j, extended across all individuals, is, therefore:

$$d_{.j} = \sum_i \delta^{ij}(Y,G,\theta) = f^j(Y,G,\theta)$$

In stage 1, to recognize the role of individuals as voters, the government decides the total amount of government grants it will allocate across the j firms via some political process. The sum of the government expenditures to the non-profits is equal to a proportional tax rate, τ, multiplied by the total pre-tax income of all individuals, y:

$$\begin{aligned} &G = (G_1, G_2, \ldots, G_J), \\ &\sum_j G_j = \tau^* \sum_i y_i \end{aligned} \tag{9}$$

The government will allocate this amount to the firms by maximizing the sum of the individual utilities where the utility for i is weighted by ρ_i, an exogenous factor representing the distribution of political power across the J donors under which the government operates.[5] After substituting Eq. (6) and Eq. (7) into Eq. (5), to determine the government grants to the non-profits, the government maximizes:

$$\begin{aligned} \max_G \sum_i \rho_i U_i \Big(& Y_i - \sum_j \delta^{ij}(Y,G,\theta), \delta^{i\cdot}(Y,G,\theta), q(f^1(Y,\theta,G) + G_1, \theta_1), \ldots, \\ & q(f^J(Y,\theta,G) + G_J, \theta_J) \Big) \end{aligned} \tag{10}$$

where $\Sigma \rho_i = 1$. Without assuming single-peaked preferences, under Besley and Coate (1997) we can solve Eq. (10) for the vector of grants chosen to reflect the preferences of individual j such that $\rho_j = 1$ and $\rho_k = 0$ for $k \neq j$.[6] This yields a vector of granting functions, η, one for each non-profit firm taking as arguments the vector of incomes for all individuals, the vector of characteristics for the J firms, and the political, economic, and demographic characteristics that affect ρ:

[5] This includes the situation under which the median voter theorem would operate if $\rho_i = 1$ for the median voter and 0 for all other voters.

[6] Under Besley and Coate (1997) we can model the government's decision as a three stage process. In the first stage potential candidates declare themselves. In stage two, voters choose for whom to vote among the group of declared candidates. And in stage three, the selected candidate makes her policy choice. In this framework, it is straightforward to show a unique mixed strategy equilibrium exists.

$$G_j = \eta^j(Y,\theta;\rho)$$
$$\eta = (\eta^1,\eta^2,\ldots,\eta^J) \tag{11}$$

The theory thus suggests we should estimate a recursive two equation empirical model. In the first equation, the government determines how much to contribute to a charitable good and, in the second equation, individuals make their decisions. The government's decision reflects the political and economic conditions of its constituents and the heterogeneity of the non-profit firms. Private donations are based on the government's choice, the political and economic conditions, and the heterogeneity in the firms' production of the charitable good.

3. Data

The data come from federal tax returns filed by IRS §501(c)(3) organizations for the period 1982 to 1992[7] (excluding 1984[8]). Representing the largest part of the non-profit sector, §501(c)(3) non-profits are those whose purposes are religious, charitable, educational, scientific, or related to public safety testing.[9] The tax returns identify the amount the non-profit firm received in private donations and government grants during the year for which the return was filed. With respect to private donations, donors may be individuals, estates, corporations, and/or other non-profit organizations. The government grants cover federal, state, and local grants. The government grants do not include payments to the non-profits for reimbursement of services provided by the non-profit under a contract. For the period studied by this paper, these types of payments are reported on a non-profit's tax return under program service revenue. Program service revenue is not limited to payments by the government; it covers any payment received by the non-profit for services provided.

The organizations have been classified in the National Taxonomy of Exempt Organizations (1996) by a four digit code. I constructed an unbalanced panel data set for organizations sampled by IRS for more than 4 years for the following organizations: crime or disaster related, employment or youth related, food or

[7]For a given year, the returns are for firms whose accounting period ended between November of that year and October of the following year. The sample is stratified based on the asset size of the non-profits. Most of the returns tracked are for non-profits with assets that exceed $500 000. For each year, IRS randomly sampled the non-profit firms within each asset level. As IRS's budget for this study increased, the number of non-profit organizations tracked for a given year also increased.

[8]Data for 1984 were not collected for budgetary reasons.

[9]An organization must file a tax return if its annual gross receipts are greater than $25 000 and it is not a religious organization.

shelters, and human services.[10] I study these organizations as they primarily operate at the local community level and appear to fall within the type of organizations in which we should expect to find a high level of altruistic behavior and, therefore, crowd-out.[11]

The organizations classified as crime or disaster related organizations address issues relating to crime prevention, public safety, criminal rehabilitation, and disaster preparedness.[12] The employment and youth related organizations are concerned with job training and counseling, vocational rehabilitation, youth centers and clubs, and youth development programs. The organizations classified as food or shelter promote adequate housing and the provision of food for individuals, families, and communities.[13] The category of 'human services' covers organizations that promote or provide a broad range of social or human services to individuals or families.[14] The revenues received from government grants and private donations account for 40–75% of the total revenue received by the organization in a given year.[15]

Because the empirical models account for changes in state level political and economic indicators, I dropped 38 observations in states with fewer than six non-profits leaving 3097 observations for 430 non-profits in 28 states. Over 45% of the observations are for non-profits located in California, Illinois, New York, Ohio, and Pennsylvania.

Table 1 reports the means, standard errors, and quartile amounts for public and private contributions to the organizations in the data set. The amounts are reported

[10]Organizations that fell within these categories were excluded for one or more of the following reasons: (a) they represented the foundation part of a non-profit organization and thus would not report fully all donations and grants received by the non-profit; (b) they were a national organization; and (c) using the first three digits of the classification scheme, more than 60% of the organizations within a sub-category received no government grants, suggesting that these types of organizations do not seek government funding.

[11]I study non-profits that provide services and goods at the community level because I use state level political and economic measures to reflect donor's attitudes towards charitable goods.

[12]The crime/disaster category includes crime prevention organizations, half-way houses for offenders, groups concerned with the prevention of child abuse, legal services organizations, fire prevention organizations, first aid organizations, and organizations concerned with safety education.

[13]The shelter category includes housing development and construction services, housing rehabilitation, shelters, and other non-recreational temporary housing facilities, as well as services to assist individuals and families in locating, acquiring, or sustaining adequate housing on a rental or ownership basis. The shelter category does not include nursing homes, camps, or protective shelters for victims of domestic violence. The food related organizations cover primarily food banks and other food distribution programs.

[14]Human services organizations cover family service agencies, shelters and aftercare programs for victims of domestic violence, as well as firms that provide direct social services to children and adolescents, and personal social services for individuals. This category includes residential, custodial care facilities and services for individuals unable to live independently due to developmental disabilities, age, or physical infirmity.

[15]Non-profit firms also receive revenue from membership dues, fees from certain programs and/or events, and other sources.

Table 1
Private donations and government grants to non-profit firms 1982–1992 (except 1984)

	Number of observations	Mean (dollars)	S.E. of mean	Quantile amounts (dollars)		
				25%	50%	75%
Private donations						
All organizations	3097	801 261	38 318.6	23 349	151 799	733 804
Crime or disaster related	166	590 865	88 584.9	11 684	143 682	507 746
Employment or youth	307	534 881	59 314.6	12 859	74 234	592 397
Food or shelter	284	265 595	57 433.1	0	13 903	113 274
Human services	2340	916 147	48 972.5	36 645	200 258	897 012
Government grants						
All organizations	3097	1 870 230	118 222.1	0	97 965	842 339
Crime or disaster related	166	1 888 645	240 845.4	12 518	431 204	2 664 417
Employment or youth	307	3 972 388	873 217.1	3336	210 158	615 231
Food or shelter	284	1 953 491	346 574.8	29 498	113 597	784 702
Human services	2340	1 583 023	95 196.2	0	81 416	814 414

Constant dollars (1987).

in constant dollars (1987 is the base year). The average private donation is less than the average government grant for all four categories. The average private donation ranges from $265 595 for food and shelter organizations to $916 147 for human services organizations. The average government grant ranges from $1.6 million for human services organizations to $4.0 million for employment and youth organizations.[16]

The importance of the data is that we can closely match government grants and private donations to a specific type of charitable good. Given the panel data set, we can control for differences between the non-profit firms in their provision of the charitable goods as well as control for shocks across time that might affect donations and grants. A limitation of the data, however, is that the only explicit measure of government funding is government grants to the organizations. Reimbursements to the non-profits for services provided under a government contract are imbedded in the non-profit's measure of program service revenue. I address this limitation in Section 5.3.1.

4. Prior studies

Prior studies provide weak support for the partial crowd-out theory (see the survey of recent studies in Steinberg (1991)). Most studies relied on income tax

[16]In a given year, all non-profits have positive private donations and/or positive government grants. Over 87% of the non-profits report strictly positive private donations in every year for which I have an observation; less than 5% of the firms report no private donations during the period studied. Over 52% of the non-profits, on the other hand, report strictly positive government grants; 22% of the non-profits received no government grants during the period studied.

returns or expenditure surveys as their source of private donations (see Reece, 1979; Paque, 1982; Amos, 1982; Jones, 1983; Abrams and Schmitz, 1984; Steinberg, 1987; Lindsey and Steinberg, 1990). A major problem with using tax returns is the type of charitable activity for which a donation is reported is not identified.[17] Lack of this information prevents (1) matching the source of government spending with the private donations, (2) separating the analysis of crowd-out by charitable activity, and (3) controlling for non-profit and other types of heterogeneity.[18]

Recently several articles have improved upon the crowd-out literature by more closely matching private donations and government grants and/or using panel data. These studies examine donations as reported at the non-profit level, thereby resolving many of the issues presented when individual reporting of donations is used. Kingma (1989) and Kingma and McClelland (1995) match donations and government grants to public radio stations to measure crowd-out for public radio. Schiff and Weisbrod (1991) use a cross section of the non-profit tax returns to identify private donations.[19] Khanna et al. (1995), Khanna and Sandler (1995) use a 7-year panel data set of 159 charities in the United Kingdom that provide health, overseas, religious, and social welfare services.

5. Measurement of crowd-out

5.1. Empirical model

The data report the private and public contributions to the non-profit organization on a yearly basis. I use the economic conditions of the state in which the non-profit is located to proxy donors' incomes and the needs of the state for the charitable goods provided by the firms studied. To incorporate the political views of the donors, I use time varying economic, demographic, and political measures at

[17]Another problem with using tax returns is that some charitable activities such as contributions to one's church are not directly supported by government funding.

[18]Model specification is another concern with many of the prior studies. Many studies use a log-linear specification, regressing the log of private donations on the log of some measure of government expenditures and other measures (see Abrams and Schmitz, 1978, 1984; Lindsey and Steinberg, 1990; Schiff, 1985; Reece, 1979; Jones, 1983). The coefficient on the government measure is an elasticity; thus, to obtain a measure of crowd-out one has to multiply the coefficient by some ratio of donations to government expenditures. The ratio chosen (i.e. mean, median, quartiles) will greatly affect the measure of crowd-out. Under a log-log specification one must assume constant elasticity. The assumption of constant elasticity, however, contradicts the prediction of the pure altruist model (that private and public donations have a slope of -1 in a linear specification).

[19]For government grants, however, they use aggregated data on government spending in areas of service related to the non-profit activity. This study aggregated information for non-profits that filed tax returns between 1973 and 1976; as explained in their paper, the data for this period were subject to more data problems than the data used in this paper.

the state level. Economic and demographic measures incorporate such variables as per capita income, the unemployment rate, and different measures of the state's population.[20] In general, I expect private and public donations to rise as real income rises if the gap between wealthy and poor individuals increases. The effect of the other measures depends, in part, on the type of charitable good provided. For example, for shelter organizations, an increase in the poverty rate should increase the need for temporary housing and so result in an increase in private and public donations.

Political measures cover the representation of the political parties in legislative positions at the state and federal level and the political party affiliation of the state's governor.[21] These measures proxy the sentiment of the voters in a given state. Liberal politicians (assumed to be the Democrats) are associated with higher provisions of social welfare programs. I expect, therefore, government grants and private donations to non-profits involved in the provision of similar goods to be positively affected with increases in the representation by Democratic politicians. Empirically, however, the political measures may be addressing bias from potential endogeneity of the government grants and therefore could be negative if donors believe an increase in Democratic legislators will increase government grants for these goods.

Table 2 reports the means and standard errors for the political and economic measures for the years and states studied. Overall, the Democratic Party controlled the state upper and lower legislatures. Real per capita income and the unemployment rate fluctuated a fair amount. In the regressions estimated, to reflect the impact of the political and economic measures on donations may vary based on the type of charitable good provided, I interact some of these measures with a dummy variable representing the four categories of non-profit firms studied.

The following model incorporates the variables discussed above:

$$D_{ijt} = \alpha + \beta Gov_{ijt} + \gamma Z_{jt} + \epsilon_{it} \tag{12}$$

where D_{ijt} is the real private donations received by non-profit firm i located in state j at time t, Gov_{ijt} is the real government grants received by the non-profit and Z_{jt} represents the vector of political and/or economic measures for the state in which the non-profit is located. The crowd-out parameter is measured by β, the coefficient on government grants.

[20]The following economic measures are used: real per capita income of individuals located in the state in which the non-profit is located; state unemployment rate; proportion of the state population whose age is greater than 65 years; proportion of the state population whose age is between 5 and 17 years; and, the state population.

[21]The following political measures are used: a dummy variable indicating if the governor is affiliated with the Democratic Party; the number of Democratic US Senators; the ratio of Democratic to total US Representatives; the ratio of Democratic to total members in the state's upper legislature; and, the ratio of Democratic members in the state's lower legislature.

Table 2
State political and economic measures

	All years	1982	1983	1985	1986	1987	1988	1989	1990	1991	1992
Number of observations	3097	100	118	183	272	385	418	415	418	415	373
Political measures											
Democratic governor (=1)	0.530	0.450	0.636	0.650	0.607	0.501	0.502	0.535	0.584	0.470	0.461
	(0.009)	(0.050)	(0.044)	(0.035)	(0.030)	(0.026)	(0.024)	(0.025)	(0.024)	(0.025)	(0.026)
Number of Democratic senators	1.175	1.070	1.068	1.098	1.114	1.177	1.170	1.202	1.194	1.222	1.217
	(0.012)	(0.064)	(0.059)	(0.051)	(0.041)	(0.036)	(0.034)	(0.668)	(0.033)	(0.032)	(0.034)
Ratio of Democratic to total											
House of Representatives	0.590	0.553	0.629	0.587	0.587	0.586	0.585	0.593	0.593	0.596	0.592
	(0.002)	(0.014)	(0.011)	(0.009)	(0.008)	(0.007)	(0.006)	(0.007)	(0.007)	(0.006)	(0.007)
Ratio of Democratic to total											
State Upper Legislators	0.292	0.256	0.255	0.259	0.267	0.264	0.262	0.263	0.261	0.256	0.521
	(0.002)	(0.007)	(0.006)	(0.005)	(0.005)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)
Ratio of Democratic to total											
State Lower Legislators	0.600	0.592	0.633	0.597	0.593	0.595	0.601	0.602	0.602	0.607	0.586
	(0.002)	(0.014)	(0.011)	(0.009)	(0.008)	(0.006)	(0.005)	(0.005)	(0.005)	(0.004)	(0.005)
Economic measures											
Real per capita income	16 604	14 102	14 508	15 405	16 087	16 478	16 890	17 171	17 099	16 864	17 235
	(41)	(141)	(142)	(127)	(123)	(109)	(114)	(115)	(112)	(108)	(110)
State population	11 900 000	10 800 000	11 200 000	11 000 000	11 200 000	11 700 000	11 800 000	12 100 000	12 100 000	12 300 000	12 300 000
	(142 618)	(640 367)	(620 083)	(506 744)	(449 142)	(386 357)	(383 799)	(400 387)	(405 713)	(415 715)	(448 379)
Unemployment rate	6.319	9.949	9.345	7.105	6.492	0.289	5.156	4.968	5.581	6.895	7.539
	(0.034)	(0.223)	(0.217)	(0.119)	(0.105)	(0.077)	(0.068)	(0.047)	(0.047)	(0.051)	(0.063)
Percent young (5–17)	18.100	19.433	18.843	18.612	18.335	18.164	17.997	17.795	17.750	17.801	18.202
	(0.024)	(0.098)	(0.090)	(0.083)	(0.073)	(0.060)	(0.060)	(0.060)	(0.063)	(0.063)	(0.089)
Percent over 65	12.560	11.856	11.968	12.120	12.388	12.492	12.550	12.638	12.734	12.779	12.883
	(0.032)	(0.158)	(0.144)	(0.118)	(0.103)	(0.087)	(0.086)	(0.088)	(0.089)	(0.090)	(0.091)
Percent in poverty	13.022	19.433	14.302	13.374	12.453	12.382	11.906	11.992	12.911	13.680	15.086
	(0.061)	(0.098)	(0.282)	(0.229)	(0.203)	(0.160)	(0.163)	(0.153)	(0.142)	(0.147)	(0.219)

Standard errors in parentheses.

As discussed in the theory, donations and government grants to a particular non-profit may be due to certain needs or conditions of the firm or community unobservable to me but not to the donors and the government. To account for the unobserved measures, I incorporate fixed effects at the state and firm level. State level fixed effects capture the variation in donations attributable to differences between the states in which the non-profits are located. Firm fixed effects might control for such things as the non-profit's reputation, age, type, and/or method of operation which affect private donations and government grants. Year fixed effects control for macro level time varying shocks.

5.2. Estimated level of crowd-out

Tables 3 and 4 report the results using a levels specification of the model discussed above. In column 1, simply regressing private donations on government grants, year fixed effects, and the political and economic measures, the coefficient on government grants is -0.0105 and is statistically significant at less than a 1%

Table 3
The effect of government grants on private donations to non-profits

Dependant variable: private donations	(1)	(2)	(3)	(4)
Government grants	−0.0105*	−0.0103*	−0.0137**	0.0094
(standard error)	(0.0030)	(0.0029)	(0.0074)	(0.0064)
Political and economic measures	Yes	Yes	Yes	No
F-test on political variables	2.00	0.67	0.28	
(*P*-value)	(0.0432)	(0.7175)	(0.9716)	
F-test on economic variables	10.72	8.83	1.75	
(*P*-value)	(0.0000)	(0.0000)	(0.0137)	
Fixed effects:				
Year	Yes	Yes	Yes	
State		Yes		
State×Year				Yes
Firm			Yes	Yes
R^2	0.0387	0.1179	0.8906	0.9129
Number of observations	3097	3097	3097	3097

Political variables: Democratic governor×type of organization, number of Democratic senators, ratio of Democratic to total House of Representatives, ratio of Democratic to total State Upper Legislators, ratio of Democratic to total State Lower Legislators.
Economic variables: real per capita income×type of organization, unemployment rate×type of organization, percent of population in poverty×type of organization, percent young (5–17)×type of organization, percent of population over 65×type of organization, state population×type of organization.
White-corrected standard errors used: *$P<0.05$; **$P<0.10$.

Table 4
Political/economic variables for regressions in Table 3

	No fixed effects effects	State and year effects effects	Firm and year effects effects
Democratic governor×crime/disaster	475 523.80*	235 528.80	−16 621.07
	(73 379.90)	(188 195.80)	(52 906.83)
Democratic governor×employment/youth	207 366.80	−28 999.98	31 235.36
	(135 728.70)	(144 574.40)	(64 264.57)
Democratic governor×food/shelter	169 325.50	−224 258.80	−16 323.51
	(111 950.80)	(175 930.30	(69 044.85)
Democratic governor×human services	334 698.60*	−86 409.03	−15 354.09
	(113 587.60)	(96 809.90)	(43 666.49)
Number of Democratic senators	75 675.59	−3217.15	−93 903.62
	(58 264.98)	(124 193.30)	(118 026.90)
Ratio of Democratic to total US			
House of Representatives	297 491.30	−221 142.60	−133 189.20
	(334 860.30)	(444 663.00)	(258 622.40)
Ratio of Democratic to total			
State Upper Legislators	658 614.30	−521 487.40	6923.28
	(490 583.70)	(736 203.90)	(200 591.50)
Ratio of Democratic to total			
State Lower Legislators	−1 635 785.00	1 647 307.00	134 280.60
	(997 629.00)	(1 360 177.00)	(372 550.70)
Real per capita income×crime/disaster	11.41	155.49	53.69
	(55.26)	(110.39)	(44.64)
Unemployment rate×crime/disaster	−31 834.75	−8374.15	−4837.13
	(47 641.12)	(53 804.77)	(20 560.24)
% of population between 5 and			
17×crime/disaster	−254 584.20*	−115 749.90	−4399.94
	(94 254.72)	(82 994.13)	(34 603.73)
% of population in poverty×crime/disaster	86 696.44*	65 331.94	−6881.21
	(42 519.07)	(50 329.99)	(9617.36)
% of population over 65×crime/disaster	−45 898.77	653 855.50*	132 837.00
	(57 881.05)	(266 700.50)	(132 825.70)
State population×crime/disaster	0.01	0.11	0.05
	(0.01)	(0.09)	(0.04)
Real per capita income×employment/youth	141.45**	261.97*	−5.49
	(72.90)	(122.83)	(148.35)
Unemployment rate×employment/youth	33 335.03	46 698.97	36 399.73
	(45 336.75)	(50 438.70)	(25 086.25)
% of population between 5 and			
17×employment/youth	−152 110.40**	−27 068.10	−40 043.77
	(82 496.03)	(73 068.97)	(29 639.77)
% of population in poverty			
×employment/youth	32 360.97	16 471.82	−1879.34
	(22 488.12)	(31 455.84)	(11 283.38)
% of population over 65×employment/youth	−281 392.70*	471 808.60**	396 779.70
	(94 430.79)	(279 789.10)	(345 053.20)
State population×employment/youth	−0.04*	0.05	0.04
	(0.02)	(0.09)	(0.04)
Real per capita income×food/shelter	−15.04	88.71	84.06**
	(39.86)	(110.53)	(49.12)

Table 4. Continued

	No fixed effects effects	State and year effects effects	Firm and year effects effects
Unemployment rate×food/shelter	−81 912.55**	−41 809.81	5637.54
	(43 224.54)	(54 921.42)	(29 059.39)
% of population between 5 and 17×food/shelter	−83 706.17	6082.56	12 989.26
	(89 989.51)	(76 810.34)	(35 065.12)
% of population in poverty×food/shelter	23 091.64	−44 023.04	−3872.08
	(19 591.03)	(40 471.23)	(14 884.37)
% of population over 65×food/shelter	−126 603.30*	702 361.10*	−5703.03
	(54 751.51)	(283 731.50)	(135 950.60)
State population×food/shelter	−0.03*	0.09	0.01
	(0.01)	(0.09)	(0.03)
Real per capita income×human services	−64.93**	87.37	138.94*
	(34.23)	(101.15)	(49.23)
Unemployment rate×human services	−4625.61	46 665.02	−13 126.44
	(38 128.71)	(45 105.01)	(16 071.40)
% of population between 5 and 17×human services	−76 450.07	29 872.71	24 224.18
	(76 933.03)	(67 490.88)	(27 570.98)
% of population in poverty×human services	39 375.00	−28 583.11	−17 476.21
	(27 334.61)	(45 016.41)	(22 371.15)
% of population over 65×human services	−123 288.00**	634 900.40*	−8044.71
	(65 199.00)	(264 070.30)	126 377.30
State population×human services	0.00	0.11	0.10**
	(0.01)	(0.09)	(0.05)

Standard errors in parentheses (White-corrected standard errors used): *$P = 0.05$; **$P = 0.10$.

level.[22] This suggests, on average, for each additional dollar of government grant, private donations effectively will not change. The F-statistic on the political and economic measures are significant at less than a 5% level.

Table 4 reports the coefficients on the political and economic measures. With respect to the political measures, private donations to organizations other than the food and shelter organizations are positively and significantly affected if the governor is affiliated with the Democratic party. This suggests donors located in states with a liberal sentiment (as measured by the party affiliation of the governor) will donate more to the non-profits than donors in states with a more conservative sentiment. Private donations to crime and disaster organizations decline with increases in the youth population rate and decreases in the poverty rate. Private donations for employment and youth organizations increase as average income

[22]Because the panel data set is unbalanced in that there is not the same number of observations and that the size of the non-profit firms vary, the disturbance terms are not likely to have the same variance. Moreover, the standard errors are likely to be biased when the political and economic variables are used in the regressions as they are measured at the state level but the donations are measured at the firm level, causing the disturbances to be correlated with in the state groupings. To correct for both of these problems, I use White (1980) corrected standard errors.

increases but decline with increases in the youth population rate, elderly population rate, overall state population.

In column 2 of Table 3, I include state and year fixed effects. The level of crowd-out is consistent (−0.0103) with the results that incorporate only time fixed effects and is statistically significant at less than a 5% level.[23] The *F*-statistic for the economic measures are significant at less than a 5% level The political measures are no longer significant and fewer of the individual economic measures are significant, suggesting the state and year fixed effects are absorbing some of the variation in the donations due to changes in the economy and the political status of the state in which the non-profit organization is located.

When I incorporate firm and year fixed effects, the coefficient on the government grants remains at a level similar to those reported above, −0.0137, but is no longer significant at less than a 5% level. In addition, the power of the economic and political measures is reduced severely. The individual coefficients for the economic measures suggest that real per capita income has a positive relationship to the food, shelter, and human services organizations. If per capita income can be viewed as a proxy for the well-being of the members in a state, then as the state's citizens become better off, non-profits, on average, will receive more in private donations.[24]

Overall, the results suggest a trivial amount of crowd-out to non-profit organizations involved in the provision of social services. With the estimated crowd-out at 1 cent, one explanation for these results is that individuals derive utility from their donations for egoistic reasons and, therefore, are not affected by changes in government funding. Regardless of the reason, however, if we accept the OLS regression methodology, the results suggest a severe cut in government funding to non-profit organizations is not likely, on average, to be made up by donations from private donors.

5.3. Tests for robustness

There are several issues with respect to the empirical model and the data that are not answered by the theory which affect the measurement of crowd-out. The biggest issue concerns the misspecification of the model because of the assumption that the government moves first is wrong or there are omitted variables in the empirical specification that are correlated with the government expenditures. These and other issues are discussed below.

[23]The *F*-statistic for the firm fixed effects is 47.6 and is statistically significant at less than a 1% level.

[24]In column 4 of Table 3, I use firm fixed effects and interact the state and year effects, allowing the state effects to vary over time. The estimated crowd-out is −0.0094 but is not significant at less than a 10% level.

5.3.1. Omitted variables

Omitted variables that are correlated with private and public donations, specifically those that represent need (an increase in demand) for the charitable good, will bias the measure of crowd-out in the OLS regression. Changes in need for the charitable good that are not likely to be absorbed by the political and economic measures or the fixed effects are most likely measured in the community in which the non-profit organization is located.[25] Reactions of government grants and private donations to shocks that affect the need or management of the firm should move in the same direction, suggesting the crowd-out estimates are positively biased and, thus, are closer to zero.

One approach that may be used to reduce any bias in the measure of crowd-out is to include variables that measure changes at the local level to control for the unexplained variation that is attributed to the bias. For example, to control for changes in need at the local level, we can exploit the first three digits of the zip code of the non-profits in the data set. I included variables that interact a three-digit zip code effect with a year effect in the specification that includes firm fixed effects. The crowd-out measured under this specification is -0.027 and is statistically significant at less than 10%.[26]

Other potential omitted variables concern the reaction of donors to changes in the level of services provided by the non-profit for which the non-profit is reimbursed directly by the government as well as the provision of similar services by other non-profit organizations.[27] Direct provision of services (e.g. via a government contract) are not included in the measurement of government grants. For the years studied in this paper, this type of funding was reported as program service revenue by the non-profit. The program service revenue measure, however, includes any funds received by the non-profit for services provided. Thus the source of such funds could be the government, individuals, businesses and other organizations. Whether this measure should be included in the regression depends on its relationship to the goods provided by the non-profit about which the donor is concerned. If private donors are not concerned about funding the goods ('non-donor related goods') which are financed by the program service revenue then inclusion of this measure in the regression represents a potential source of cross-subsidization between the non-donor and donor related goods. Inclusion of this variable in the OLS regression does not affect the results reported in Table 3;

[25]For example, natural disasters (i.e. a tornado or flood), economic events (i.e. a plant or factory closing), or other occurrences (i.e. a change in the crime rate or the influx of illegal immigrants) are shocks that could affect a community but not the state. Shocks that cover changes in the quality of the non-profit firm include such things as a radical change in management or in the activities on which the organization is focused.

[26]Other potential omitted variables which were tested but did not significantly change the results reported in Table 3 include measures of donations and/or grants to other non-profits located in the same state as the non-profit studied.

[27]The direction of the bias from this type of omitted variable is unclear.

the crowd-out coefficient remains effectively zero and the coefficient on the revenue measure is quite small and not statistically significantly different from zero. If, however, private donations are directed towards the goods for which program service revenue is also used, then the program service revenue is a very noisy measure of the other source of government funding and should not be included in the regression.[28]

5.3.2. Two stage least squares estimation

If private donations and government grants are jointly determined, then the latter are endogenous, biasing the measures of crowd-out. One way to remove bias from the estimated level of crowd-out is to use measures that are correlated with government grants but not with private donations as an instrument for the government grants term under a two stage least squares method of estimation. Finding measures that are correlated with government expenditures but are not correlated with private donations is quite difficult.

Two groups of potential instruments are government transfer payments to individuals and government transfer payments to non-profits. Transfer payments to individuals are payments to persons for which they do not render services. These payments include retirement and disability insurance benefit payments, medical payments (i.e. Medicare), income maintenance benefit payments (i.e. supplemental security income, aid to families with dependent children, food stamps), unemployment insurance benefit payments, veterans benefit payments, federal education and training assistance payments, and other miscellaneous payments (i.e. compensation of victims of crime, disaster relief benefits, Bureau of Indian Affairs benefits). Government transfers to individuals are arguably good instruments as they reflect expenditures by the government for goods similar to the services provided by the non-profits in this study.

Transfer payments to non-profits located in the same state as the non-profit organization studied include state and local payments and Federal payments except those made under research and development contracts. The measure of the Federal government payments to non-profit institutions is based on a national estimate which is then allocated to the states in proportion to the state's population.[29] State

[28]Bias in the measurement of crowd-out might also occur if the government provides only matching grants to the non-profits insofar as the non-profit, to receive the government grant, would be required to raise a certain amount of money from private donors. Matching grants are most common in areas such as the arts and education. Moreover, the use of matching grant programs is a relatively recent phenomenon. Given I am studying organizations in the social service sector for the period between 1982 and 1992, it is unlikely this source of bias seriously affects the results presented in this paper.

[29]Although these transfers to non-profits should include the grants to the non-profits studied, the magnitude of the average transfer (over $83 million for Federal and $129 million for state and local) is such that the proportion of the transfer attributable to a given non-profit in the sample is quite small.

and local government transfer payments are payments for foster care supervised by private agencies, payments for education assistance, and payments for employment and training. Given that non-profit organizations compete with other non-profit organizations for government funding, government grants to one organization arguably are affected by the amount of government transfers to all non-profit organizations within a state.

Table 5 reports the results for several combinations of the individual and

Table 5
Relationship between private and public donations using two-stage least squares regression

Dependent variable		Government grants Stage 1 results	Private donations Stage 2 results	Residuals from stage 2 over-identificationtest	Hausman specification test
		(1)	(2)	(3)	(4)
Instruments used	Exogenous Measures	*F*-stat on instruments (*P*-value)	Coeff. on govt. grant (S.E.)	Chi-square statistic (df)	*F*-stat on instruments (*P*-value)
Individual transfers ≠ 1	St. Econ ≠1 and St. Pol.	2.19 (0.0326)	−0.5327* (0.2022)	7.61 (6)	7.82 (0.0052)
Non-profit transfers ≠ 1	St. Econ ≠1 and St. Pol.	0.06 (0.9450)	−1.2412 (4.8177)	1.01 (1)	0.21 (0.6468)
Non-profit transfers ≠ 1 lagged	St. Econ ≠1 and St. Pol.	2.7700 (0.0631)	−0.7510 (0.4651)	0.00 (1)	2.61 (0.1066)
Individual transfers ≠ 1 and non-profit transfers ≠ 1	St. Econ. ≠1 and St. Pol.	1.85 (0.0555)	−0.5773* (0.1984)	8.12 (8)	8.94 (0.0028)
Individual transfers ≠ 1 and non-profit transfers ≠ 1 lagged	St. Econ ≠1 and St. Pol.	2.56 (0.0063)	−0.4137* (0.1459)	11.41 (8)	7.54 (0.0061)
Individual transfers ≠ 1 and non-profit transfers ≠ 2	St. Econ ≠1 and St. Pol.	2.20 (0.0194)	−0.5398* (0.1660)	7.86 (8)	9.96 (0.0194)
Fixed effects		Firm and year	Firm and year	Firm and year	Firm and year

Political variables: Democratic governor×type of organization, number of Democratic senators, ratio of Democratic to total US House of Representatives, ratio of Democratic to total State Upper Legislators, and ratio of Democratic to total State Lower Legislators.
Economic variables ≠ 1: real per capita income×type of org, unemployment rate×type of org, percent in poverty×type of org, percent over 65×type of org, percent young (5–17), state population×type of org.
Individual transfers ≠ 1: retirement and disability, medical (Medicaid), income maintenance (SSI, AFDC, food stamps, and other misc. benefits), unemployment insurance benefits, veterans benefit payments by government, federal education and training.
Non-profit transfers ≠ 1: payments made by federal government to non-profits, payments made by state and local governments to non-profits.
Non-profit transfers ≠ 2: non-profit transfers ≠ 1 (year t)−non-profit transfers ≠ 1 (year t−1).
*$P<0.05$.

non-profit transfers.[30] In column 1, I report the F-statistic on the instruments in the first stage regression of the government grants on the exogenous variables and the instruments. In column 2, I report the coefficient on the government grants term in the second stage regression. In column 3, I report the chi-square statistic to test for the over-identification of the instruments computed by regressing the residuals from the second stage regressions on the instruments and exogenous measures. And, in column 4, I report the F-statistic on the residual term from the Hausman (1978) specification test which tests the null hypothesis that the OLS and 2SLS regressions are the same. The test statistic is computed by regressing private donations on the government grants, exogenous measures, and the residual from the first stage regression.

For four of the six specifications, at a P-value of less than 0.05, the level of crowd-out is highly negative, at ~50 cents per dollar. If just the government transfers to individuals are used, the F-statistic on the instruments in the first stage regression have a P-value of 0.03. In the second stage regression, the level of crowd-out is -0.5327 with a standard error of 0.2020, suggesting that for the average non-profit, if government grants increase by one dollar, private donations will fall by 53 cents.[31] Both the over-identification and Hausman tests are satisfied.

If just the government transfers to non-profits are used, the crowd-out coefficient is higher but is no longer statistically significant at less than a 10% level. Using the government transfers to non-profits lagged by 1 year provides stronger results than the measure of current transfers to non-profits; under the specification which uses lagged transfers, the crowd-out coefficient is -0.75 with a P-value of less than 0.11. If the transfers to individuals and non-profits are used together, the crowd-out coefficient ranges from -0.41 to -0.58 depending on whether the current, lagged, or 1 year difference in transfers to non-profits are used as measures.[32]

Thus, after controlling for possible endogeneity and omitted variable bias, the results under 2SLS provide dramatically different results than under OLS. While

[30]Because the instruments used in Table 5 may not be strictly exogenous and instead are predetermined or weakly exogenous, the 2SLS was computed by first differencing the data to remove the organization fixed effect and then running the regressions using the first differenced measures. Using a first-differenced 2SLS provides consistent yet inefficient results, whereas with weakly exogenous results incorporating dummy variables for the firm fixed effects in the 2SLS leads to inconsistent results.

[31]The 95% confidence interval of this coefficient suggests that crowd-out ranges between -0.12 and -0.94.

[32]If the measure of program service revenue is included as an exogenous measure in the second stage regression, the crowd-out coefficient on the government grants term remains close to -0.50 and is statistically significant at less than a 5% level, and the coefficient on the program service revenue is also negative, approximately -0.09, and statistically significant at less than a 5% level. This suggests that donors react both to changes in government grants and to program service revenue but that the greater reaction is seen in the government grants.

the OLS results suggest private donors are egoistic and are not affected by changes in government funding, the 2SLS results suggest donors are neither purely altruistic nor egoistic.

6. Conclusion

This paper uses a data set that is richer and possibly more suited to studying the relationship between private and public donations than most prior empirical studies. I match private donations with government contributions to charitable organizations that may be identified by type of charitable good to concentrate on the crowd-out effect for human services and other related organizations. Changes in donations are measured over time permitting me to account for heterogeneity across charitable organizations, time, and/or states.

My analysis suggests crowd-out exists but is not complete. Across the various specifications and the assumption that donors respond to the government's actions, the crowd-out parameter is negative and relatively consistent. If an OLS specification is used the crowd-out is effectively zero. After correcting for potential endogeneity of the government grants under a 2SLS specification, crowd-out is partial and differs significantly from zero and one dollar. In the 2SLS specification, the instruments are strong in the first stage regression and satisfy the over-identification and Hausman specification tests.

In this paper, I treated non-profit organizations as passive players but recognized heterogeneity through the use of fixed effects. The fixed effects control aspects of the non-profit that do not change during the 10-year period studied. Thus, I do not control for time-varying changes at the non-profit level. Further, I do not explore the role of the non-profit in soliciting grants and donations. An area of further research, therefore, concerns the role played by non-profits and their affect on donor behavior.

In addition, I focused on the question of how donors to a particular type of charitable good react to changes in government funding for that good. Another question we should explore is how donations for one type of good change when government funding to another type of charitable good is changed; for example, if government funding to social services is cut, will that cause an effect in donations to art and cultural organizations?

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