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Private Philanthropy and the Economics of Public Radio

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PRIVATE PHILANTHROPY AND THE
ECONOMICS OF PUBLIC RADIO

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Abstract

Public radio in the United States receives both direct and indirect government funding. Direct subsidies come in the form of lump-sum and matching grants, while indirect subsidies proceed from tax revenues foregone on deductible private donations. Each of these sources of government money impacts charitable giving to public radio. This paper estimates both of these effects, using data on a national sample of public radio stations in the United States from 1990-96. I find that public funding to stations has a positive impact on private giving, but this impact rapidly decreases as the level of government subsidies increases, ultimately becoming negative. The analysis also indicates that increases in state tax rates correspond with higher donation levels. This paper explores the implications of these and other findings for policymakers, public administrators, and nonprofit managers.

Introduction

Public radio in the United States has had a controversial tenure since the passage of the Public Broadcasting Act of 1967.[1] The main actors in the public radio movement—most prominently, National Public Radio (NPR), Public Radio International (PRI) and Pacifica—have been dogged by allegations of left-wing bias (Douglas 1999) or that they have displaced legitimate commercial activity (Berry and Waldfogel 1999). As such, the relationship between public radio and Republican-led governments since the early 1990s has been troubled, at best. Some observers find it miraculous that the Corporation for Public Broadcasting (CPB), for example, survived the 104th Congress of 1995-96 (Walker 1997).

The political polemics surrounding public radio tend to obscure the day-to-day fiscal challenges for public administrators and nonprofit managers involved in this industry. These challenges begin with understanding the basic composition of income. First, government funding for public broadcasting in general, and public radio in particular, is substantial. At present, it constitutes one-third of total revenues. This is reflected in Figure 1, which shows the breakdown of funding sources to public broadcasting in 1998.

Figure 1. Funding for Public Broadcasting, 1998

Source: Corporation for Public Broadcasting
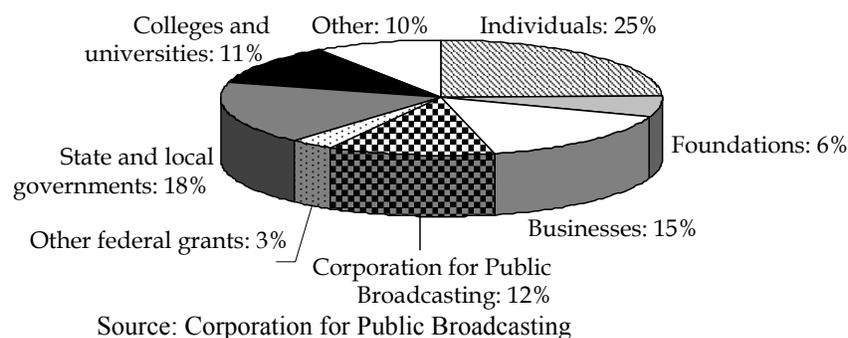
The 33 percent of funding from government in Figure 1 is somewhat misleading, however, because this only refers to *direct* public funding. Public radio and television stations, like all 501(c)(3) nonprofit organizations, receive indirect government support through the

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[1] 47 USC Sec. 396.

special tax treatment of charitable contributions. Technically, governments pick up a portion of private contributions through contributors' tax deductions. This is an important funding mechanism for nonprofits, created explicitly to fund public goods and services without direct government intervention (Hall 1987). For most nonprofits, indirect funding is greater than direct funding—it makes up two-thirds to three-quarters of all government subsidies to the arts, for example (Schuster 1987; Feld, O'Hara and Schuste. 1983).

Understanding the funding stream for public radio is complicated by the fact that the direct and indirect government funding might impact an even larger portion of revenues: the 46 percent that comes from the support of individuals, foundations, and corporations. This impact could occur in two ways. First, higher or lower levels of direct government support might change giving behavior by leveraging ("crowding in") or displacing ("crowding out") private giving (Brooks 2000a). Second, changes in income tax rates might alter incentives to give charitably, as the "price of giving" is affected (Steinberg 1990). Both of these resource interactions need to be considered in the course of performing an analysis of the costs and benefits of fiscal policies and management decisions.

A number of papers have looked at direct and indirect impacts separately for nonprofit organizations, but few studies to date have considered them simultaneously. This paper does so for public radio, using data on 104 public stations in the United States from 1990-96. While it focuses on the specific case of public radio, this study produces empirical findings and policy tools for public administrators and nonprofit managers in other fields as well.

The rest of this paper is organized in four parts. It begins with background on the history and structure of public radio's funding, and the literature on direct and indirect funding to nonprofit organizations. Next, data and models are introduced to perform regression anaysis on the impacts of government funding on private donations. Third, the regression results are

presented and interpreted. The paper concludes with a discussion of the implications of the results for policymakers, public administrators, and nonprofit managers.

Background

Public Radio in the United States

Public radio in the United States was basically nonexistent before passage of the Public Broadcasting Act of 1967 (Engelman 1996). This Act grew out of the findings of the Carnegie Commission on Educational Television (1967), which argued that publicly-controlled media was integral to the social reforms of the time. The Act established the CPB, with an initial appropriation of $5 million for 1969 (about $24 million in year 2001 dollars). This quickly rose through the 1970s to over $300 million in today's dollars; since then it has fluctuated around this level, reflecting in large measure the changing fortunes of political forces sympathetic to its funding. Figure 2 shows CPB funding from its inception to the present.

Figure 2. Corporation for Public Broadcasting Appropriations

Source: Corporation for Public Broadcasting

While the CPB ushered in the era of public broadcasting, it subsequently came to constitute just one part of its funding. Indeed, today it is only 12 percent of total public broadcasting revenues, and is accompanied by a number of other government and private sources of funding, as was illustrated in Figure 1.

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The Relationship between Public Subsidies and Private Giving

Direct government funding of public broadcasting in general (and of public radio in particular) consists of two parts. The first are lump-sum grants; the second are matching grants based on Nonfederal Financial Support (NFFS) to stations: contributions from individuals, corporations, and foundations. The sizes of the lump-sum and matching portions follow CPB and other government formulas that generally take into account listener bases, minority populations, and other criteria (Straub 1999). As a general rule, however, higher private contribution levels translate into higher levels of direct public support in subsequent years.

A number of authors in public administration and economics have studied the effect of government funding to nonprofit organizations (such as public radio stations) on private donations. In terms of direct funding, this is the "crowding out" question: Do government subsidies displace private donations, or leverage them? On the one hand, private donors might be encouraged to give more when the government contributes, due to reputational effects, better information about recipients, and (especially in public radio's case) matching-fund arrangements. On the other hand, donors may perceive less "need" when the government funds a nonprofit organization, and therefore donate less.

Authors have generally modeled the problem within the traditional public-goods provision framework. For example, say agent k consumes a public good P and a private composite good x. Define person k's utility with the function

$$u_k = u\left(x_k, P\right). \tag{1}$$

Denominating each in dollar quantities, he consumes $P=C+G$ and x_k of each, respectively, where C is the total level of private donations to the public good and G is the level of government contributions. Assume that $C = \sum_i c_i$, where $i \in \Phi$ is the set of all donors; and $G = \sum_j g_j$,

where g_j is taxpayer j's tax bill, and $j \in \Omega$ is the set of all taxpayers. Person k's problem can be described as:

$\max\{u_k(x_k, C+G)\}$, subject to

$c_k \geq 0$ (so all contributions are non-negative), and

$x_k + c_k + g_k \leq m_k$, where m is income.

Predictions about the relationship between C and G generally depend on the assumptions about the overlap between donors and taxpayers. For example, Warr (1982) and Roberts (1984) assume that $\Phi = \Omega$, which leads to the conclusion that $\frac{\partial C}{\partial G} = -1$; that is, government support displaces private donations on a dollar-for-dollar basis. Bergstrom, Blume, and Varian (1986), however, assume that $\Phi \subset \Omega$ but $\Phi \neq \Omega$, suggesting that $-1 < \frac{\partial C}{\partial G} < 0$.

In support of the latter result, the most common finding in the (fairly large) empirical literature has been that of partial crowding out (e.g., Steinberg 1993). The most common finding is that a dollar in government support of a nonprofit organization displaces between 10 and 50 cents in private giving (Brooks 2000a).

In a study specifically about public radio, Kingma (1989) found that an extra $10,000 in total government money to a station crowded out about 15 cents from each individual donor. This is consistent with most studies on arts and culture nonprofits, although it is notable that Hughes and Luksetich (1999) found a crowding-in relationship between state funding to history museums and private giving.

The most recent work on crowding out has suggested that the relationship between subsidies and donations is probably not linear. For instance, Brooks (2000b) found that for nonprofit performing arts organizations, low levels of government subsidies crowded in private donations. When subsidy levels became high enough, however (after they reached about 25

percent of the organizations' total budgets), a crowding out effect occurred as nonprofits began to look increasingly like quasi-governmental agencies.

In contrast with direct subsidies, indirect government funding to public radio comes from forgone tax revenues. For example, say a contributor to public radio has an effective marginal tax rate of m (where $0<m<1$), and itemizes deductions for charitable contributions on his or her income tax returns. Each dollar in income donated results in a deduction of m. Hence, if the taxpayer donates D dollars in income to the local public radio station, the government indirectly pays mD of this donation.

Studies of the effects of indirect government funding have focused on the impact that changes to income tax rates have on donations (e.g., Clotfelter 1985). Most papers look at individual-level tax data to estimate these effects, and have not generally focused on donations to specific recipient organizations—such as public radio stations. These studies always hold consumer income constant, so it is not surprising that donation levels increase with tax rates—as rates rise, government picks up more of the donation to a nonprofit. In a meta-analysis of the economic analyses on this topic, Steinberg (1990) found that on average, a 10 percent increase in the tax rate leads to about a 12 percent increase in charitable donations.

Data and Models

The empirical analysis that follows will seek to estimate both direct and indirect government funding impacts on private giving to public radio. To answer these questions, this study employs an uneven panel of 104 public radio stations over the period 1990-96. The data were compiled from CPB records and initially analyzed by researchers at the University of Wisconsin in 1999 (Straub 1999). They represent all nonprofit radio stations with assets of more than $10 million, as well as a probability sample of smaller stations.[2]

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[2] The full dataset includes more than 400 observations over several years. I have selected the one year's sample containing the largest number of stations.

The dataset includes information on private donations, government funding from various sources, earned revenues, expenditures on fundraising, potential listenership, coverage area, and affiliations with NPR and/or a sister television station. I have augmented these data with state tax rates (Federation of Tax Administrators 2001) and per capita personal income (*Statistical Abstract of the United States* 2000). Federal tax rates are not included, because all stations have listeners that are subject to the same rates.

Given the fact that data on individual donors' tax rates and incomes are not available, each state's maximum income tax rate (which should capture the variance in the average tax rate for donors) and the average income for the station's state are used instead. To obviate the problem of comparability of stations of dramatically different sizes, the monetary variables are divided by the size of their estimated potential listenerships to create per capita measures. This also eliminates a possible source of omitted variable bias, in that a station's listener base should affect both its donations and the size of its government grant.

Table 1 describes the data for the one year (1995) that provides the largest single cross-section (91 stations).

Table 1. Summary of Public Radio Data, 91 Stations in 1995*

Variable	Definition	Mean	Standard deviation	Minimum	Maximum
DONATED REVENUES	Donations per potential listener	$5.94	$11.20	$0	$76.15
GOVERNMENT SUBSIDIES	Government funding per potential listener	$6.51	$20.74	$0	$133.32
EARNED REVENUE	Earned income per potential listener	$3.63	$7.96	$0	$50.27
FUNDRAISING EXPENSES	Expenses on fundraising and development per potential listener	$1.40	$3.24	$0	$22.78
MAXIMUM STATE TAX RATE	Maximum tax rate for station's state of incorporation	5.12%	3.38%	0%	12%
PER CAPITA PERSONAL INCOME	Personal income per capita in station's metropolitan area or state	$23,527	$2,850	$18,223	$31,732
COVERAGE AREA	Area covered by station signal (square miles)	4,909	5,122	38	25,227
NPR AFFILIATE	Station is an NPR affiliate (dummy variable)	0.73		0	1

| TV STATION | Station has a sister television station (dummy variable) | 0.21 | 0 | 1 |

Source: Author's Calculations.

Estimation begins with an ordinary least squares (OLS) regression to test the effects of government subsidies, state tax rates, other revenues, expenses, station characteristics, and personal income on the level of private donations directed to each station. To allow for the possibility of *both* crowding in and crowding out (depending on government subsidy levels), following Brooks (2000b), Equation 1 also includes the squared value of government funding. A finding of crowding in at low levels of government funding—followed by crowding out at higher levels—would be indicated by a positive coefficient on the linear government funding term, but a negative coefficient on the squared term. Model 1 is specified as:

$$D_i = \alpha + \beta_1 G_i + \beta_2 G_i^2 + \beta_3 T_s + X_i \beta_4 + \varepsilon_i \qquad (2)$$

where D_i is the level of private donations per listener for station i, G_i is the level of government funding per listener, T_s is the tax rate in state s (where station i is located), X_i is a vector of the other regressors, and ε_i is a random disturbance. Model 1 estimates equation (2) for the entire uneven panel, while Model 2 only looks at a single year, 1995. In the former case, X contains a trend term to neutralize year-specific effects in the panels.

Since the left-hand side variable is censored at zero, I also employ a tobit specification to estimate equation (2). I calculate the marginal effects for each of the coefficients as $\frac{\partial E[D^* \mid X]}{\partial X} = \beta \theta \left(\frac{X\beta}{\sigma} \right)$, where θ is the proportion of the sample in which donations per capita is positive.

Traditionally, empirical studies of both crowding out and tax effects on donations suffer from endogeneity, necessitating the use of instrumental variables. For example, while government funding might affect private donations, the reverse might be true as well. And tax rates should impact giving, but due to deductibility, contribution levels also should affect tax

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rates. Multi-stage approaches are not necessary with these data, however, for two reasons. First, the structure of government funding to public radio makes the relationship between private and public funds one-way. Governments collect data on donations from the previous fiscal year, and then make matching grants the year after that; as such, government money follows private giving with a two-year lag, so any association between the two in a given year must be from the former to the latter (Straub 1999). Second, tax rates used in my estimations are not individual donors' marginal rates but rather (maximum) state rates, making them invariant to contribution levels. Endogeneity is also implausible for other variables such as earned income and fundraising expenditures: Customers of paid services are unlikely to be aware of current donation levels, and stations make their fundraising budget decisions based on the success of prior campaigns.

The existing literature leads to expectations about the regression results. First, we would expect donations to vary positively with the tax rate. Second, we cannot predict the effect of government subsidies on donations, except to say that crowding in is more likely at low funding levels, and crowding out at higher levels. Presumably, fundraising expenses should drive up donations. NPR affiliation should increase donations, assuming that this makes listenership more valuable. Similar to government funding, higher earned revenues could drive donations either up or down, depending on donors' reactions to perceived commercial success. If anything, a television affiliate and larger coverage area should increase donations as they enhance a station's visibility.

Regression Results

Tables 2 and 3 present the regression estimates.[3] We first note that the OLS and tobit results are very similar. This is not surprising, because 96 percent of the donations levels were non-zero in the full panel, while 98 percent were positive in the 1995 sample.

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[3] In the regressions that follow, heteroscedasticity was corrected using White's (1980) heteroscedasticity-consistent covariance matrix estimation technique.

Turning to Model 1 in the tobit specification, we see that both of the crowding-out coefficients are statistically significant, while the tax rate is not. (Maximum state tax rates may be insignificant in these data because of the lack of variance in this measure across the panels.) Government subsidies to public radio stations crowd in private donations per capita at a rate of about 27 cents on the first dollar of subsidies, but this effect diminishes with subsequent government funding. Model 2's results are slightly different. First, for the 1995 panel, tax rates were significant: A 1-point increase in the maximum state tax rate corresponded with a 32-cent increase in donations per capita. Second, the while the first dollar government funding crowded in about 63 cents, this effect decreased at about twice the rate as in Model 1.

Table 2. OLS Estimates Measuring Influences on Donations per Listener to Public Radio

Independent variable	Coefficient (standard error)	
	Model 1 (Full panel)	Model 2 (1995 only)
INTERCEPT	-0.1928	0.2296
	(2.4397)	(3.214)
GOVERNMENT SUBSIDIES	0.366***	0.7143**
	(0.1166)	(0.2935)
GOVERNMENT SUBSIDIES SQUARED	-0.0016***	-0.0033[+]
	(0.0005)	(0.0024)
MAXIMUM STATE TAX RATE	0.0491	0.3109**
	(0.1579)	(0.1431)
EARNED REVENUE	-0.0175*	-0.2126
	(0.0104)	(0.148)
FUNDRAISING EXPENSES	1.3625***	1.5886***
	(0.5083)	(0.538)
PER CAPITA PERSONAL INCOME	0.00012	0.00001
	(0.00015)	(0.00014)
COVERAGE AREA	-0.000033	0.000089
	(0.000068)	(0.000099)
NPR AFFILIATE[++]	-1.144	-1.5674
	(0.7473)	(1.2822)
TV STATION[++]	-0.7124	-0.1575
	(0.9626)	(1.0699)
TREND	0.0828	
	(0.2587)	
Adjusted R^2	.38	.76
N	400	91

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.
[+] Significant at the .17 level.
[++] Dummy variable
Source: Author's Calculations.

Table 3. Tobit Estimates Measuring Influences on Donations Per Listener to Public Radio

Independent variable	Coefficient (standard error) [marginal effect]	
	Model 1 (Full panel)	Model 2 (1995 only)
INTERCEPT	0.2616 (4.82)	0.1655 (4.5638)
	[0.1859]	[0.1456]
GOVERNMENT SUBSIDIES	0.3861*** (0.0604)	0.7209*** (0.1239)
	[0.2743]	[0.6342]
GOVERNMENT SUBSIDIES	-0.0018*** (0.0004)	-0.0033*** (0.001)
SQUARED	[-0.0013]	[-0.0029]
MAXIMUM STATE TAX	0.0437 (0.1725)	0.3237* (0.1856)
RATE	[0.0311]	[0.2847]
EARNED REVENUE	-0.025** (0.0123)	-0.2176*** (0.0791)
	[-0.0178]	[-0.1914]
FUNDRAISING EXPENSES	1.3601*** (0.1912)	1.5642*** (0.2092)
	[0.9663]	[1.3759]
PER CAPITA PERSONAL	0.000093 (0.000212)	0.000012 (0.00019)
INCOME	[0.000066]	[0.00001]
COVERAGE AREA	-0.000013 (0.000112)	0.000091 (0.000113)
	[-0.000009]	[0.00008]
NPR AFFILIATE[++]	-1.3041 (1.1862)	-1.5964 (1.2979)
	[-0.9265]	[-1.4042]
TV STATION[++]	-0.4696 (1.2349)	-0.089 (1.3459)
	[-0.3336]	[-0.0783]
TREND	0.1093 (0.3354)	
	[0.0776]	
N	400	91

* Significant at the .10 level.
** Significant at the .05 level.
*** Significant at the .01 level.
[+] Significant at the .17 level.
[++] Dummy variable
Source: Author's Calculations.

A simple simulation based on the full-sample regression results shows that crowding out begins when government funding per capita reaches about $106. This is illustrated in Figure 3.[4] At the highest rate of government funding in this sample of stations ($233 per capita), each dollar in public subsidies crowds out about 33 cents in private donations.

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[4] This simulation is conducted as follows. Say the regression yields $\hat{D} = \alpha + \hat{\beta}_1 G + \hat{\beta}_2 G^2 + X\hat{\beta}_3$. The rate of crowding out at any particular level of G is then $\frac{\partial D}{\partial G} = \hat{\beta}_1 + 2\hat{\beta}_2 G$. The levels of G in the simulation correspond to the range of values found in the sample.

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Figure 3. Crowding In or Crowding Out of Private Donations at Different Levels of Government Support Per Capita
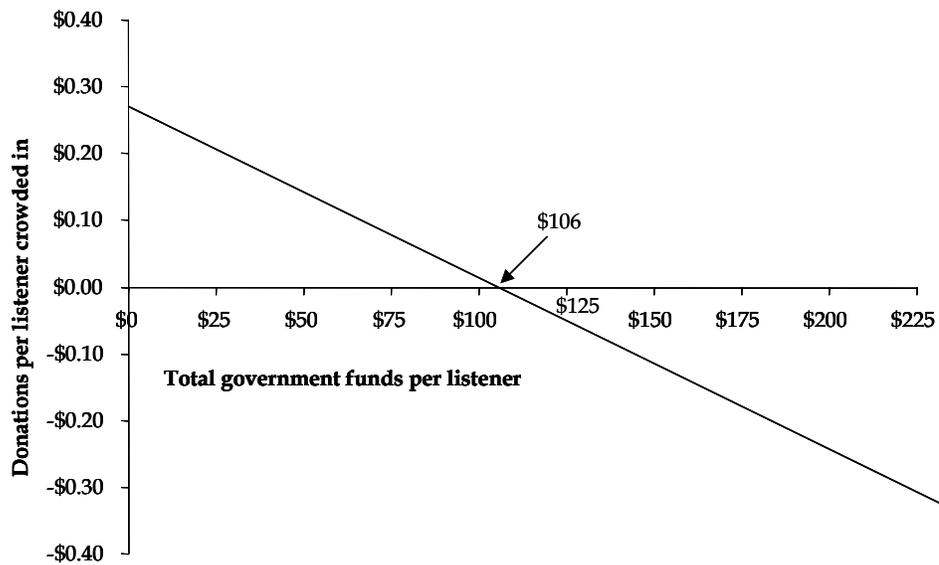
Source: Author's Calculations.

The other coefficients in the models are generally consistent with one another. In Model 1, a dollar increase in fundraising expenditure leads to an increase of 97 cents in donations, while it leads to $1.38 in Model 2. Earned revenue is significant in both models. In Model 1, an additional earned dollar displaces about 2 cents in donations per listener, whereas it crowds out about 19 cents in Model 2. Statistically insignificant variables in both models include coverage area, NPR and television affiliations, the time trend, and per capita personal income.[5]

From the standpoint of the nonprofit economics literature, the estimates in this paper indicate an unusual relationship between government funds and private donations, at least at relatively low levels of government funding. With the exception of a few studies such as that by Hughes and Luksetich (1999) and the work on social welfare nonprofits by Schiff (1990, 1985), crowding in is not a typical finding. The explanation for this surely lies in the unusually stringent matching-grant requirements for government money to public radio stations, which essentially "hardwire in" the crowding-in phenomenon.

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[5] The insignificance of this last variable is mildly surprising, given the typical finding that income correlates strongly with giving (Steinberg 1997). However, the measure of personal income is an average figure for a station's

While this paper's tax effect is consistent with Kingma's (1989) public radio study, the crowding-in finding is not. This may be attributable to the fact that his estimations employed quite different data—those on individual donations (instead of aggregate donations to stations) from nine years earlier than my data. In addition, Kingma's measure of public support contained all sources (government and private) of income besides station memberships, and as such measured a somewhat different relationship than that here. From a public administration perspective, however, separating out government subsidies is critical for understanding the specific impact of this policy tool.

Implications for Public Administrators and Nonprofit Managers

To summarize the central findings, the data suggest the following for public radio stations:

1. Low levels of public funding to stations have a leveraging impact on private giving, but this impact rapidly decreases as the magnitude of government subsidies increases. At high levels of government funding, public dollars displace private donations.

2. Increases in state tax rates correspond with more in donations per capita to public radio.

It is appropriate in this paper to remain agnostic as to whether, on balance, public radio is a *good* or *bad* thing from an economic or political perspective. Indeed, such discussion would have to delve into whether public radio functions as a public good, as well as the proper role of government in the provision of public goods and services (Kingma and McClelland 1995). The introduction to this paper pointed out that some argue that public radio serves an important positive social purpose, while others argue just as strongly that it destroys private-sector value and tends to promote a particular political viewpoint. These issues are outside the scope of this article. Instead, this research sheds light on the effects of policy tools on public radio's finances, for good or ill.

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state, which is quite imprecise and perhaps not especially characteristic of the income of public radio donors. This

For most nonprofit organizations, direct government funding is a mixed blessing. As previously noted, crowding out is ubiquitous across the sector, meaning that in the short term, most nonprofits sacrifice part of their private support when they accept public support. In the long term, the problem may be even worse, if crowding out adversely affects habits in charitable giving. For public radio, however, this wouldn't appear to be a problem (except at extraordinarily high funding levels). As a matter of fact, these results may lead one to speculate that long-term giving habits might possibly be fostered by moderate levels of government support for public radio.

It appears that these direct government leveraging effects are a function of the matching-grant structure of public radio funding. As such, policies to build partnerships between governments and other types of nonprofits might ameliorate problems with crowding out through similar schemes. This is especially germane to current discussion about the federal government's initiatives to partner with faith-based nonprofit organizations for the provision of social and human welfare services.

Note that governments can structure their funding to social service nonprofits in a way that matches each private dollar (although not necessarily one-for-one), but still expends the same amount of resources as at present. If the current subsidy to a nonprofit is S and the expected level of donations is $\hat{D}$, the match per dollar to keep expenditures even should be $\dfrac{S}{\hat{D}}$. Naturally, calculating this matching rate requires an accurate prediction of donations, but ample data on the nonprofit sector exist to make a reasonable attempt at such a prediction.

The effects of income tax changes on donations to public radio are similar to the impacts on other types of nonprofit organizations. All else constant, higher tax rates lead to more donations via government paying a larger part of the gift. However, it doesn't necessarily follow that public radio proponents should automatically despair from tax cuts at the federal or state

variable might simply not be of high-enough quality to capture real existing correlation.

level. The tax rate coefficients estimated in the regressions look at taxes in isolation, whereas in reality a tax cut would radiate through other variables of interest in determining donation levels. Most notably, while income is statistically insignificant in my models, this result is unusual. Steinberg (1990) found that on average, a 10 percent increase in income led to a 6.5 percent increase in charitable giving. Thus, if a tax cut spurs work incentives and increases income, it may lead to more in contributions, not less. In addition, public radio proponents would likely find it hard to sell tax increases to state legislators merely for the indirect benefits they provide to public radio stations.

Finally, while the conclusion in Model 2 about the impact of fundraising expenditures should be encouraging for nonprofit managers who spend a good deal of their time on donor development, it should be interpreted with a degree of caution. Other work on arts and culture nonprofits has suggested that the impact of fundraising can vary dramatically according to organization size (Brooks 1997). Future research on public radio (and other nonprofits) could examine such scale effects in greater depth.

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