

# When is Administrative Efficiency Associated With Charitable Donations?

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*Whether accounting measures of administrative efficiency affect donations is an important issue for nonprofit managers. Prior research is inconclusive. Some studies find a significant negative relation, whereas others find no significant relation. The authors investigate a variety of reasons for the prior divergent results. The evidence is consistent with donors reducing contributions to organizations reporting higher administrative expense ratios when the ratios are presumably most relevant and reliable. The authors suggest that certain prior studies failed to find significant associations largely because their samples contained many organizations for which the administrative ratios were unreliable or not helpful for donor needs. Model specification issues also affect prior studies but are less critical than sample composition. When the authors replicate prior studies on samples containing established, donation-dependent organizations with nontrivial amounts of fund-raising and administrative expenses, they generally detect a significant negative association.*

**Keywords:** *efficiency; financial ratios; donations; administrative expenses*

Many nonprofit organizations currently face a need to increase administrative spending. In some cases, the organizations have identified improvements in programmatic efficiency or effectiveness that require improved infrastructure (Urban Institute and the Center on Philanthropy at Indiana University, 2004b). In addition, recent legislative efforts at the state and federal levels to apply some of the internal control provisions of the Sarbanes-Oxley Act to nonprofit organizations, if implemented, will require increased administrative spending.

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If a nonprofit organization reports increased spending on administrative infrastructure, will it lose public support? This question is the focus of this article.

A prevailing assumption in the nonprofit field is that donors view administrative expenses negatively, as a diversion of funds from program expenses. Weisbrod and Dominguez (1986) argue that higher levels of administrative costs increase the "price" to the donor of obtaining a dollar's worth of program output. They suggest higher prices discourage donations to particular organizations, for the same reasons that higher prices in for-profit markets encourage consumers to seek out substitute products.

Donor fixation on ratios, if it exists, might induce dysfunctional behavior by managers. The Urban Institute and the Center on Philanthropy at Indiana University (2004b) warn that competition to show low administrative ratios "induces nonprofit managers to under-invest in good governance, planning, compliance, and risk management, collection of data for service performance evaluations and staff training" (p. 4). Another possible dysfunctional effect would be deliberate underreporting of administrative expenses. A recent paper by Krishnan, Yetman, and Yetman (2006) finds systematic underreporting of fund-raising expenses.

The amounts of public support at issue are sizeable. Each year, Americans make donations equal to about 2% of gross domestic product, which in 2004 amounted to more than \$248 billion (AAFRC Trust for Philanthropy, 2005). They give to a wide variety of causes, ranging from their local houses of worship to overseas relief for disaster victims. Donations are normally channeled from donors through nonprofit organizations to the ultimate recipients. Whatever cause a donor supports, the donor has a choice among numerous organizations serving that very cause because there were almost 1.4 million nonprofit organizations registered with the IRS in 2004 (National Center for Charitable Statistics [NCCS], 2006).

Surprisingly, there is little published empirical research directly on the association between reported administrative efficiency and donations. Most research on the association between donations and organizational efficiency has focused either on reported fund-raising ratios (defined variously as fund-raising expenses divided by total revenues, or by donations, or by total expenses) or on measures of price that encompass both fund-raising and administrative spending. As discussed below, some of the studies that directly address administrative efficiency found significant relations to donations, whereas others have not.

The differing descriptions of donors' reactions to reported administrative ratios are reminiscent of John Godfrey Saxe's (1963) poem, based on the fable about a group of blind men who encounter an elephant, touch differing parts, and come to different conclusions. In the case at hand, the divergent findings could be because of looking at different data sets or using different models to "touch" the research objective.

The purpose of this article is to not just perform one more study of the issue but to understand what factors in prior studies led to findings of

significance or insignificance. We examine a variety of potential factors that could explain insignificant results, including a true lack of a significant relation, econometric factors that could bias against finding significance even though a relation exists, and factors related to the existence of a relation in a particular sample.

Following accounting theory, we presume that donors only react to accounting disclosures that are “decision useful” and that necessary qualitative characteristics of decision-useful data include reliability and relevance. The idea of reliability includes the information’s faithful representation of the underlying construct, its verifiability, and its neutrality. Relevance encompasses concepts of timeliness, value in prediction, and value in assessing prior information (see FASB, 1980). Differences in information reliability and relevance across samples are predicted to affect decision usefulness and thus the measured association. Samples with unreliable or irrelevant data would have reduced likelihood of significant relations.

This article makes three contributions. First, we use standard accounting concepts to identify organizational characteristics associated with sensitivity of donations to reported administrative ratios. Second, by testing the robustness of our conclusions to a variety of models, including modifications of the Posnett and Sandler (1989) model, Greenlee and Brown’s (1999) model, and Frumkin and Kim’s (2001) model, we identify model characteristics that affect the measured sign and significance of the association. Finally, our replications of prior studies (both on a large recent set of NCCS data and on samples similar to those used in the original studies) help reconcile their findings.

The second section discusses prior research. The third section discusses factors that can cause empirical studies to fail to detect a significant relation. These factors guide our empirical testing. The fourth section describes the three data sets used for empirical testing. The fifth section presents the regression analysis. The sixth section concludes the article.

## PRIOR RESEARCH

During the past 20 years, the availability of IRS Form 990 data has enabled researchers to perform a variety of studies. Unfortunately, prior literature indicates the need for caution in using IRS data in empirical research. Steinberg (1983) noted an implausible number of organizations reporting zero administrative and/ or fund-raising expenses in data from the 1970s. Others expressing concern about the reliability of the reported data in later periods include Froehlich and Knoepfle (1996), Gordon, Greenlee, and Nitterhouse (1999), and the Urban Institute and the Center on Philanthropy at Indiana University (2004a). Recently, Krishnan et al. (2006) report that understatements of fund-raising expenses in IRS Form 990 filings are widespread and appear to be associated with managers’ incentives to appear more efficient, both to attract donations and to increase their own compensation.

Although there has been considerable research on the association between donations and reported efficiency measures, most such research has focused either on fund-raising ratios or on program expense ratios. Administrative expenses have been less thoroughly studied. In this section, we first discuss the general findings regarding other accounting variables and then discuss more specifically the prior studies of administrative efficiency measures. Parsons (2003) provides a more thorough literature review.

Much research on the link between reported financial results and subsequent donations has followed the approach taken by Weisbrod and Dominguez (1986). They suggest that donations represent donors' demand for a nonprofit's services. Following standard economic reasoning, they argue that demand for charitable services (as expressed by donations) depends on the price of obtaining the services, the organization's fund-raising efforts, and its reputation for quality (proxied by organizational age). In this view, organizational spending on either fund-raising or administrative functions is seen by donors as a diversion of resources from programs and raises the price of program output to the donors. In their model, fund-raising efforts had both a direct, positive effect of making donors aware of the organization and a lagged negative effect of increasing the perceived price of inducing program spending.

Posnett and Sandler (1989) extended the model, including controls for other revenue sources that might "crowd out" donations, and Tinkelman (1999) added a size control. These price models all use log-linear specifications, in part to reduce heteroscedasticity. In these studies, the price of obtaining charitable output was assumed to increase based on the fraction of the organization's expenses diverted from program spending to either administrative or fund-raising purposes. Ignoring any tax benefits, Posnett and Sandler defined price as follows:

$$Price = \frac{1}{1 - f - a}$$

Here,  $f$  and  $a$  are the fractions of total expenses spent on fund-raising and administration. If all an organization's expenses are either fund-raising, administrative, or program, then algebraically price reduces to the inverse of the program expense ratio.

Although several studies have examined the price sensitivity of donations, none have separately studied the differential impacts of  $f$  and  $a$  while maintaining the other control variables. Several papers have found a negative association between donations and some type of fund-raising ratio (see Okten & Weisbrod, 2000; Tinkelman, 2004; Weisbrod & Dominguez, 1986). Although this relationship did not hold in the first-difference model used by Steinberg (1986), Tinkelman (1999) suggests that the lack of significance may have been because of the sensitivity of this type of model to data errors, combined with the prevalence of errors in the IRS data. Others have found a negative relation to both administrative and fund-raising ratios taken jointly or,

what is equivalent, a positive relation between donations and a program expense ratio (e.g., Callen, 1994; Khanna, Posnett, & Sandler, 1995; Marudas & Jacobs, 2004; Posnett & Sandler, 1989; Tinkelman, 1999).

Only four prior empirical studies have tried to identify the link between donations and administrative expense ratios. Only Greenlee and Brown (1999) unambiguously found the negative relation predicted by Weisbrod and Dominguez (1986). Two studies (Frumkin & Kim, 2001; Steinberg, 1983) did not find a significant negative relation at all, and one (Jacobs & Marudas, 2003) found a negative relation in some but not all samples tested. We discuss these studies in chronological order.

Steinberg (1983) found no significant relation between an administrative cost ratio and donations in IRS Form 990 data from the mid-1970s. Steinberg's empirical model is different than that used by most empirical researchers. Weisbrod and Dominguez (1986), and studies following their approach, use a log-linear model in the levels of the key variables. Steinberg's model uses first differences of donations and most explanatory variables. Unfortunately, first-difference models are not robust to data errors, and, as noted above, IRS data have many errors (see Tinkelman, 1999, regarding the lack of robustness of Steinberg's first-difference model in the presence of data errors).<sup>1</sup> We have chosen not to replicate Steinberg's work because of the age of the data tested and the lack of robustness of the model.

Greenlee and Brown (1999) found the predicted negative association in a study of Pennsylvania nonprofits. They separated the effects of fund-raising and administrative ratios using Pennsylvania regulatory data for approximately 700 regulatory filings each year from 1991 to 1994 but did not control for other factors used in the price model. Their empirical model omits controls for organizational age, crowding in, and current fund-raising efforts. Because they did not control for fund-raising expense levels, their fund-raising ratio variable does not distinguish between the positive direct fund-raising effect and the negative lagged effect suggested by Weisbrod and Dominguez (1986). They define the administrative ratio as administrative expenses divided by the sum of administrative and program expenses. Their model, which uses the semilog form, is:

$$\ln(\text{contributions}_t) = F(\text{administrative ratio}_{t-1}, \text{fund-raising ratio}_{t-1}, \text{total contributions}_{t-1})$$

Because their model requires 2 years of data, Greenlee and Brown (1999) separately performed regressions for 1992, 1993, and 1994. They did not attempt to subdivide their sample into different sectors of the nonprofit field. They consistently found coefficients on the administrative ratio to be negative and significant at the .001 level, with values ranging from  $-.117$  to  $-.156$ . They found significant positive coefficients for the fund-raising ratios, implying the positive impact of greater fund-raising levels outweighed the lagged negative impact of high fund-raising in raising the perceived price of donations.

In contrast to Greenlee and Brown (1999), Frumkin and Kim (2001) found no significant association between the administrative ratio (defined as administrative divided by total expenses) and donations for any of their six industry subsectors. Four of the regression coefficients were positive, and two were negative. They concluded that “nonprofits that position themselves as cost-efficient—reporting low administrative to total expense ratios—fared no better over time than less efficient appearing organizations in the market for individual, foundation, and corporate contributions” (p. 266).

Frumkin and Kim (2001) used IRS Statistics of Income (SOI) databases for the 11-year period 1985 to 1995. Thus, their sample was drawn from a national, rather than a state, base. They separated their sample into six subsectors (arts, education, health, human services, public benefit, and other) to control for possible different effects by sector. An important limitation to their work is that the SOI data are not representative of the nonprofit population. The IRS includes all organizations with more than \$10 million in assets, but only a stratified sample of smaller organizations each year. By requiring a balanced panel for an 11-year period, Frumkin and Kim skewed their sample even more toward larger organizations. In particular, education and health organizations make up 26% and 44%, respectively, of their sample, reflecting the large physical plants needed for universities and hospitals.

Frumkin and Kim (2001) used a single regression on a balanced panel of 2,359 organizations that appeared each year. In part to avoid serial correlation issues, Frumkin and Kim used a one-way generalized least squares approach. Frumkin and Kim’s empirical model was as follows:

$$\text{Contributions} = F(\text{administrative ratio, program expenses, level of fund-raising expenses, total revenues, government grants})$$

All independent variables are measured as of the prior year. All variables except the administrative ratio are measured in log form.

The choice of variables makes the results hard to interpret. Their model excludes a variety of other variables found to be significant in other research, such as the fund-raising ratio, organizational age, and other revenue sources. More importantly, because they control for program spending, it is unclear why donors should disfavor the administrative ratio; it no longer represents a diversion of funds from programs as it does in the two previously discussed models. However, donors may naively focus solely on administrative spending and ignore the actual levels of program spending.

Jacobs and Marudas (2003) reexamined Frumkin and Kim’s (2001) work using SOI data. They argue that a more proper model specification would use the log form of all the variables, including the administrative ratio. They find, using the logged administrative expense ratio, and a two-way random effects model, that 2 of the 6 sectors (education and other) would have significant negative associations, whereas in the other four sectors the association remains insignificant.

In summary, prior research on the administrative ratio's association with donations is inconclusive. None uses a large, recent national sample. The studies do not all find significance. The studies are difficult to compare because they use different samples and different models. None uses all of the control variables suggested by the literature relating donations to program expenses or the price of donations.

## INVESTIGATING THE CAUSES OF VARYING SIGNIFICANCE LEVELS

We take two separate approaches to investigating the reasons significance levels may vary. First, we consider the circumstances under which donors are most and least likely to consider administrative cost ratios useful in allocating donations among organizations. The Financial Accounting Standards Board (1980), in its project defining the conceptual framework of accounting, states that both reliability and relevance of data are critical to decision usefulness. We consider which attributes of organizations affect the perceived relevance and reliability of the administrative expense ratio and test whether results differ when our samples are restricted to organizations for which the data are more likely to be relevant and reliable. Second, we separately consider econometric issues that may cause a valid relation to fail to appear.

We follow prior research in considering what aspects of a given sample affect the relevance and reliability of the data to donors. In research on the price sensitivity of donations, Tinkelman (1999) identified four factors that affect the size and significance of the relation. Price sensitivity was lower for:

- Start-up organizations, defined as organizations younger than 4 years. Organizational performance in the start-up phase may be seen by donors as atypical and thus of limited relevance.
- Organizations that normally received less than 20% of their revenues from donations. For such organizations, the overall administrative ratios will predominantly reflect the costs of administering the parts of the organization that are supported by program fees or other revenue sources, not the donor-supported functions. Thus, donors are likely to regard organization-wide administrative expense disclosures as of limited relevance.
- Smaller organizations, not required to have audits. Unaudited results are likely to be perceived as less reliable. Tinkelman (1999) noted that New York required audits of organizations receiving more than \$100,000 in donations.
- Organizations with "implausible" data, defined as zero fund-raising or administrative expenses. Various observers have questioned whether it is plausible that more than half of all nonprofit organizations report spending nothing on fund-raising (see GuideStar, 1996; Urban Institute and the Center on Philanthropy at Indiana University, 2004a). Most recently,



Krishnan et al. (2006) find many instances of organizations reporting zero fund-raising in IRS filings when in fact they have fund-raising personnel, devote resources to soliciting funds and even report fund-raising costs in their audited financial statements. Donors may well discount extremely low fund-raising or administration ratios as unreliable.

Even if donors truly penalize organizations with high administrative ratios, a variety of econometric problems could potentially explain why any given study might fail to find a significant negative relation. Such problems include a lack of power, badly specified models, heteroscedasticity, multicollinearity, omitted variables, and the effects of outlying observations. To determine whether these problems affected prior research, we attempted to replicate the prior work, with and without corrections for these issues.

Statistical power is affected by several factors, one of which is sample size. We replicated the Frumkin and Kim (2001) and Greenlee and Brown (1999) studies both on samples that were similar to the original ones and on the much larger NCCS data set.

A variety of model specification issues can obscure a true statistical relation. As noted above, Jacobs and Marudas (2003) found Frumkin and Kim's (2001) results are sensitive to whether the administrative ratio is measured in the log form or as a simple ratio. We therefore test the various models for robustness to differences in form. Because the models differ in their form, among log-linear for price, semilog for Greenlee and Brown, and a combination of the administrative ratio and logs for Frumkin and Kim, we reran our major results for the NCCS sample using rank regression. This form of regression uses the ranks of the variables, rather than their raw values, and is robust to differences in form as long as the relationship is monotonic (see Lang & Lundholm, 1993).

Regression analysis assumes a relatively homogeneous population. If the data are heteroscedastic, conventionally computed *t*-statistics will be misleading. We have taken several steps to reduce the impact of heteroscedasticity, including the use of White's (1980) corrected *t*-statistics. We also examined whether the donations-administrative ratio changes signs at different levels of organization size, age, administrative spending, or administrative ratios. No such effects were detected.

Multicollinearity can cause a variety of problems in regression analysis, including unexpected signs of coefficients and a lack of robustness of results (Davidson & MacKinnon, 1993). We believe this issue is most likely to arise when a single model includes independent variables related to each of the three types of expenses—administrative expenses, fund-raising expenses, and program expenses—as the Frumkin and Kim (2001) model does. We examine this issue both by computing standard regression diagnostics and by testing models with and without variables believed to cause multicollinearity.



Omitting variables can bias regression results. Neither Frumkin and Kim's (2001) nor Greenlee and Brown's (1999) models include all of the control variables used in the price studies cited above. To address this, we test a price model with  $f$  and  $a$  listed separately:

$$\text{Direct contributions} = F(f, a, \text{fund-raising expenses, age, total assets, other revenues})$$

Following prior literature, all variables are measured in log form. All independent variables are measured as of the prior year. To avoid interactions between high fund-raising expenses and low administrative ratios, we follow Greenlee and Brown (1999) and define the administrative ratio as administrative expenses divided by the sum of administrative and program expenses.

To ensure that our results are not skewed by a few unduly influential observations, we routinely compute a SAS diagnostic statistic, the "leverage" statistic, and rerun regressions without highly influential observations. Normally, our results are robust, and we present them for all observations. Where a few observations do skew the results, we present the reported results without these observations.

## DATA

We test three samples. The largest and most recent is comprised of 182,373 observations from the NCCS/GuideStar database for 2000 and 2001 (NCCS sample). To replicate prior studies, which were conducted on data from the 1980s or early 1990s, we obtained two additional samples, one of 1992 to 1994 New York State regulatory data (NYS sample) and one of 1982 to 1994 IRS SOI data (SOI sample). The NCCS and SOI data were obtained from the NCCS.

The NCCS sample consists of Form 990 data for organizations with fiscal years ending in 2000 and 2001. It is a broad national sample, with a wide range of types and sizes of organizations. Generally, organizations with more than \$25,000 in total revenues must file 990s, although exemptions exist for churches and certain other organizations.

The NYS sample was obtained from the New York Department of State. It roughly parallels the Pennsylvania data reviewed by Greenlee and Brown (1999). It is a much larger sample (approximately 10 times the size), allowing us to subdivide the results by sector. As in Pennsylvania, all organizations soliciting more than \$25,000 annually in the state were required to file, unless they qualified for an exemption, and organizations raising more than \$100,000 in donations were required to submit audited filings. Religious organizations and many schools were exempt. The format of the filings

largely followed generally accepted accounting practices and was consistent with the IRS Form 990. New York classified organizations into 11 mutually exclusive categories, including a catchall “other” category. For brevity, we only present data for 1993 for the New York sample. The 1994 data are similar and were used for robustness tests on all our main results.

The SOI sample parallels Frumkin and Kim’s (2001) sample and consists of information for seven types of organizations from the IRS SOI databases for the years 1982 to 1984 and 1986 to 1994. No SOI data were produced in 1985 (for a discussion of SOI databases, see Gordon et al., 1999; NCCS, 2004). Because SOI databases include mainly large organizations, we believe using SOI data for Pennsylvania for 1992 to 1994 does not provide an appropriate basis for replicating Greenlee and Brown’s work.

Following Weisbrod and Dominguez (1986), Okten and Weisbrod (2000), and Tinkelman (2004), we selected the following types of organizations: libraries, art museums and zoos, services to the poor, hospitals, services to the handicapped, scientific research, and higher education. If two observations in the same year of the SOI database had the same employer identification number, we eliminated the second observation. We also screened out observations with missing data for either the year tested or the prior year, inconsistent data for the end of the prior year and the beginning of the current year, or obviously erroneous registration dates. Because this sample extends over more than a decade, all financial data were adjusted by the consumer price index. Unlike Frumkin and Kim (2001), we chose not to create a balanced panel containing only those organizations with observations in every year, because of our concerns regarding skewing the sample toward large organizations.

Table 1 indicates the selection criteria used to arrive at the samples used in the empirical analysis. The initial numbers of firm-year observations were 469,525 for the NCCS sample, 10,289 for the NYS sample, and 22,266 for the SOI sample. After eliminating observations with missing data, implausible ages, or data for periods not tested, the samples used for analysis are 182,373 organizations in the NCCS sample (38.8% of the initial firm years obtained), 7,380 in the NYS sample (71.7%), and 7,404 in the SOI sample (33.3%). By excluding organizations that do not have consecutive observations, we may be biasing our sample toward excluding smaller organizations. This is especially true for the SOI data, which were collected by the IRS using a stratified sampling procedure based on organizational size.

In our analysis, we compare results for the overall samples to results for “restricted” samples. These samples are restricted to those organizations meeting the criteria posited to relate to data relevance or reliability as discussed above. The organizations must report administrative and fundraising expenses of more than \$1,000. The organizations must be at least 4 years old, must have received more than \$100,000 in donations in the prior year, and must have received donations equal to at least 10% of prior year total revenues.

**Table 1. Sample Selection**

	NCCS (2000-2001)	NYS (1992-1994)	SOI (1982-1994)
Initial data obtained	469,525	10,289	22,266
Less: missing data or implausible ages	(100,850)	(1,721)	(13,854)
Less: data for inapplicable periods	(186,302)	(1,188)	(1,008)
Total "overall sample"	182,373	7,380	7,404
Less: fund-raising or management expense < \$1,000	(136,676)	(4,012)	(4,934)
Less: other restrictions	(18,095)	(1,406)	(1,097)
Total "restricted sample"	27,602	1,962	1,373

*Note:* NCCS = National Center for Charitable Statistics; NYS = New York State; SOI = Statistics of Income. The NCCS data were obtained from the NCCS/GuideStar database of organizations filing Form 990 for 2000 and 2001. The NYS data were obtained from the New York Department of State databases of filings in 1992 to 1994. The SOI data, obtained from the NCCS, represent an extract of data from the IRS SOI tapes for certain categories of nonprofit organizations from 1982 to 1983 and 1985 to 1994. The criteria used to select organizations from the overall samples for the restricted samples are: fund-raising and administrative expenses must both exceed \$1,000, age must exceed 3, prior year donations must exceed both \$100,000 and 10% of total prior year revenues.

There is a temptation, when considering the relation of donations to spending ratios, to assume that most organizations are like our restricted sample organizations—established organizations raising significant donations and reporting nontrivial administrative and fund-raising expenses. That is not the case. If our criteria are taken individually, approximately 12% of the full NCCS sample organizations fail the age criterion, 53% rely on donations for less than 10% of revenues, 67% have less than \$100,000 in donations, and 75% report implausibly low administrative or fund-raising expenses. As indicated in Table 1, more than 70% of each full sample fails at least one of these criteria, leaving restricted samples of 27,602 (15% of the full sample) for the NCCS data, 1,962 (26%) for the NYS sample, and 1,373 (19%) for the SOI data. The full samples are largely composed of organizations either that are young, that are not reliant on donations, or that do not report significant nonprogram spending. As indicated in Table 2, the median fund-raising expense in each of the three full samples is zero. Even if there is in truth a relation between nonprogram spending and donations for donor-reliant organizations, including the many non-donation-reliant organizations in the samples tested may obscure the relation.

Table 3 presents the sample composition by category. The largest category in the NCCS sample is human services, which composes approximately 36% of the full sample and 33% of the restricted sample. The composition of the full NCCS sample is similar to the restricted NCCS sample.<sup>2</sup> In contrast, the compositions of the full and restricted SOI samples are different. The full SOI sample is dominated by hospitals (59%), but hospitals tend not to be heavily reliant on donations, so they only compose 20% of the restricted sample. The

Table 2. Descriptive Statistics–Full Samples

	Mean			Median			Standard Deviation		
	NCCS	NYS	SOI	NCCS	NYS	SOI	NCCS	NYS	SOI
<i>Revenues</i>									
Donations	519	1,205	1,540	18	105	154	6,676	7,131	6,582
Programs	2,722	2,653	38,732	13	7	12,986	47,039	22,999	107,718
Government	336	710	1,722	0	4	0	4,913	6,563	12,358
Other	529	533	2,992	9	14	814	16,100	5,761	9,618
Total	4,178	5,101	45,290	229	448	16,864	55,880	28,577	114,952
<i>Expenses</i>									
Fund-raising	44	154	124	0	0	0	628	1,120	375
Administrative	465	623	5,474	19	62	1,538	5,731	3,986	10,277
Program	3,162	4,045	36,479	152	313	12,498	44,573	24,156	100,893
Total	3,713	4,821	42,157	197	427	15,385	49,860	27,440	105,031
<i>Expense ratios</i>									
Administrative (%)	13.8	18.7	18.1	8.6	13.6	13.4	19.2	18.9	18.6
Fund-raising (%)	2.4	6.4	1.4	0.0	0.1	0.0	8.1	14.3	4.6
Total assets	7,432	7,641	58,109	259	345	22,782	129,965	121,532	145,529
Age	18.3	14.7	31.5	14.0	10.0	34.0	15.2	11.7	16.3
N	182,373	7,380	7,404	182,373	7,380	7,405	182,373	7,380	7,405

Note: NCCS = National Center for Charitable Statistics; NYS = New York State; SOI = Statistics of Income. All dollar figures are in thousands. The administrative (fund-raising) ratios are defined as (administrative expenses) ÷ (total expenses) and (fund-raising expenses) ÷ (total expenses). Age is the number of years after the organization registered with either NYS or the IRS, depending on the sample. NCCS donation data are from 2001, and other data are from 2000. NYS data are from 1993. SOI data are from 1982 to 1994, except 1985.

Table 3. Sample Composition by Organization Category

	Full Sample		Restricted	
	n	%	n	%
<i>NCCS sample</i>				
Arts	19,235	10.5	3,730	13.5
Education	29,834	16.4	3,861	14.0
Environment	6,538	3.6	1,511	5.5
Health	27,237	14.9	3,683	13.3
Human services	65,268	35.8	9,045	32.8
Other	34,261	18.8	5,772	20.9
<b>Total</b>	<b>182,373</b>	<b>100.0</b>	<b>27,602</b>	<b>100.0</b>
<i>SOI sample</i>				
Libraries	78	1.1	19	1.4
Museums/zoos	422	5.7	227	16.5
Services to poor	173	2.3	38	2.8
Hospitals	4,373	59.1	271	19.7
Aid to handicapped	370	5.0	80	5.8
Scientific research	622	8.4	174	12.7
Higher education	1,366	18.4	564	41.1
<b>Total</b>	<b>7,404</b>	<b>100.0</b>	<b>1,373</b>	<b>100.0</b>
<i>NYS sample</i>				
Health	929	12.6	284	14.5
Social welfare	1,935	26.2	306	15.6
Civic	617	8.4	134	6.9
Arts/cultural	1,584	21.5	458	23.3
Animals/environmental	218	2.9	76	3.9
Social/fraternal	289	3.9	70	3.5
Support	720	9.8	255	13.0
Hospitals	251	3.4	35	1.8
Public policy	557	7.5	265	13.5
Foreign relations	87	1.2	51	2.6
Other	193	2.6	28	1.4
<b>Total</b>	<b>7,380</b>	<b>100.0</b>	<b>1,962</b>	<b>100.0</b>

*Note:* NCCS = National Center for Charitable Statistics; NYS = New York State; SOI = Statistics of Income. The categories used for the NCCS sample follow the National Taxonomy of Exempt Entities system. The older SOI sample was categorized based on the IRS activity codes used in the 1980s and early 1990s. The NYS sample is categorized based on New York's classification system.

higher education institutions compose 18% of the full sample, but the removal of so many hospitals raises the share devoted to education institutions to 41% of the restricted SOI sample. The NYS sample, because of different regulatory requirements applicable to colleges and hospitals, has relatively fewer colleges and hospitals.

Table 2 contains key statistics for each full sample. Each sample shows a high degree of variation, as demonstrated by relatively large standard deviations for the various financial variables. In a number of ways, the NCCS

and NYS samples are fairly similar, especially when compared to the SOI sample, which is deliberately skewed by the IRS toward large organizations, such as hospitals and colleges. For example, the mean total revenues for the full NCCS and NYS samples are \$4,178,000 and \$5,101,000, much smaller than the SOI mean total revenues of \$45,290,000. The mean total assets of the NCCS and NYS organizations are \$7,432,000 and \$7,641,000, compared to \$58,109,000 for the SOI sample. The SOI organizations, with a mean age of 31.5 years, are significantly older on average.<sup>3</sup> The SOI sample organizations are also, on average, less reliant on donations, with mean donations of \$1,540,000, less than 4% of mean total revenues, compared to 12% and 24% for the NCCS and NYS samples. Not surprisingly, the SOI organizations report spending proportionately less on fund-raising than the other samples.

Each sample reports significant administrative expenses. The mean administrative cost ratios were 13.8% (*Median* = 8.6%) for the NCCS sample, 18.7% (*Median* = 13.6%) for the NYS sample, and 18.1% (*Median* = 13.4%) for the SOI sample.

Table 4 contains summary data for the restricted samples. Organizations in the restricted samples are on average more donation reliant than those in the full samples. Comparing Tables 2 and 4, donations as a percentage of total revenues increase from 12% to 39% for the NCCS sample, from 24% to 54% in the NYS sample, and from 3% to 23% in the SOI sample. Because they are more donation reliant, the restricted samples have higher mean fund-raising ratios than the full samples. Because many large hospitals and colleges are eliminated because of their low reliance on donations, the mean organizational size in the SOI sample falls both in terms of revenues and total assets. In the other two samples, which did not start with as high a proportion of hospitals or colleges, the impact of the restrictions was to increase mean size measures because organizations with less than \$100,000 in donations were eliminated.

There are significant differences between mean and median values in both Tables 2 and 4, suggesting skewed distributions. The effect is more pronounced in Table 2, in part because of the large numbers of organizations reporting very small values for a variety of variables. Our empirical tests attempt to control for this issue in several ways. First, we compare results for the full and restricted samples. Second, we transform data into logs to reduce the effect of the dispersion. Third, we use White's procedure for computing *t* tests, which is robust to heterogeneous populations.

## REGRESSION ANALYSES

As discussed above, we expected that donors are less likely to penalize organizations for high administrative ratios (or reward them for low ones) when the administrative ratios convey less reliable or relevant information. We test this expectation by comparing regression results, using each of the

**Table 4. Descriptive Statistics–Restricted Samples**

NCCS	Mean			Median			Standard Deviation		
	NYS	SOI	NCCS	NYS	SOI	NCCS	NYS	SOI	NCCS
<i>Revenues</i>									
Donations	2,307	3,167	4,746	398	660	1,891	14,452	10,365	12,641
Programs	1,640	1,048	9,949	29	13	25,929	19,993	5,803	42,226
Government	522	694	2,173	0	0	160	8,417	4,950	12,160
Other	1,318	979	3,147	37	68	1,122	24,876	6,271	7,607
Total	5,983	5,887	20,287	937	1,221	7,940	56,557	17,971	69,023
<i>Expenses</i>									
Fund-raising	234	433	441	43	88	227	1,523	1,496	680
Administrative	511	581	1,965	101	155	900	3,494	1,763	3,672
Program	3,696	4,346	14,948	585	824	5,148	32,859	13,806	59,661
Total	4,477	5,361	17,357	779	1,134	6,825	36,820	15,978	61,195
<i>Expense ratios</i>									
Administrative (%)	15.7	15.9	19.1	12.8	12.8	14.7	12.3	12.4	16.6
Fund-raising (%)	8.3	11.0	4.9	5.4	7.6	3.2	10.0	12.2	5.8
Total assets	15,685	10,443	48,206	1,160	1,122	18,493	18,152	50,824	137,979
Age	25.0	19.1	36.4	21.0	15.0	40.0	16.7	12.4	15.0
N	27,602	1,962	1,373	27,602	1,962	1,373	27,602	1,962	1,373

*Note:* NCCS = National Center for Charitable Statistics; NYS = New York State; SOI = Statistics of Income. All dollar figures are in thousands. The administrative (fund-raising) ratios are defined as (administrative expenses) ÷ (total expenses) and (fund-raising expenses) ÷ (total expenses). Age is the number of years after the organization registered with either NYS or the IRS, depending on the sample. NCCS donation data are from 2001, and other data are from 2000. NYS data are from 1993. SOI data are from 1982 to 1994, except 1985. The samples are restricted to meet the following criteria: age is 4 or greater, prior year fund-raising expenses and administrative expenses each exceed \$1,000, prior year direct contributions exceed 10% of total income, and direct contributions in the prior year exceed \$100,000.



three major models, for our full samples to the results for our restricted samples. The restricted samples are composed of those organizations where the ratios were least likely to be irrelevant or unreliable. Organizations in the restricted samples are beyond the start-up phase, reported more than \$1,000 each of prior year fund-raising and administrative expenses, and relied on donations for at least 10% of prior year revenues. Regressions were performed on an overall basis for each sample and separately by the categories listed in Table 3.

We concentrate most of our analysis on the NCCS sample, which is both the largest and the most recent. For the NCCS sample, direct contributions for 2001 were regressed on explanatory variables from 2000 using our price model and the original specifications of the two prior models. Tables 5 and 6 present the regression results for the full and restricted samples.

In general, the results for the control variables in both tables are consistent with prior research. Donations are positively related to organizational size, whether measured as log of total assets (the price model), total contributions (Greenlee & Brown, 1999) or total revenues (Frumkin & Kim, 2001). Other revenue sources had relatively small coefficients, reflecting some minor amount of crowding out or crowding in.

Research since Weisbrod and Dominguez (1986) indicates that fund-raising efforts have both a direct positive effect on donations, by stimulating public awareness, and an indirect, smaller, lagged negative effect, through the fund-raising ratio, because donors who perceive prior year fund-raising expenses as too high may penalize the organization. As expected, the fund-raising expenditures are strongly positively associated with donations. In the price model, where the prior year fund-raising expense is separated from the fund-raising ratio, the coefficient for the fund-raising ratio is significantly negative, reflecting the secondary, negative effect. In Greenlee and Brown's (1999) model, where the only variable reflecting fund-raising efforts is the fund-raising ratio, it has a positive relation with fund-raising, which is consistent with the direct positive effect outweighing the indirect secondary negative effect.

The program expense variable, included only in Frumkin and Kim's (2001) model, is positively related to donations in their model. If this variable is added to the other two models, regression diagnostics indicate a substantially higher degree of multicollinearity, which would affect the reliability of all the regression coefficients.

The coefficient of age varies between samples. It is 0.28 for the full NCCS sample and -0.14 for the restricted NCCS sample. Tinkelman (1999) found a similar change in sign when comparing audited and unaudited NYS organizations. He suggests that although normally high age may proxy for high organizational quality, as suggested by Weisbrod and Dominguez (1986), in samples where organizational quality is controlled for in some other way, low age may indicate the organization deals with a more topical cause.

Table 5. Regressions of Direct Contributions–Full NCCS Sample

	Price Model		Greenlee and Brown (1999) Model		Frumkin and Kim (2001) Model	
Intercept	4.37*	(53.47)	8.11*	(466.06)	1.37*	(18.06)
Administrative ratio <sup>a</sup>	−0.11*	(11.38)	0.14*	(2.28)	3.26*	(59.82)
Fund-raising ratio <sup>a</sup>	−0.07*	(9.01)	11.15*	(70.49)		
Ln (fund-raising)	0.45*	(148.52)			0.47*	(193.01)
Ln (total assets)	0.16*	(20.67)				
Ln (government grants)	0.06*	(28.42)			0.04*	(17.14)
Ln (program revenue)	−0.11*	(51.01)				
Ln (other income)	0.00	(0.69)				
Ln (age)	0.30*	(21.63)				
Lagged contributions (in millions)			0.07*	(42.44)		
Ln (total revenue)					0.05*	(7.38)
Ln (program expense)					0.33*	(121.33)
N	147,639		149,954		182,373	
Adjusted R <sup>2</sup>	.24		.05		.37	

Note: NCCS = National Center for Charitable Statistics. The table lists the coefficients and the absolute values of *t*-statistics for regressions of the variables shown on the log of direct contributions. All independent variables are measured as of the prior year. The administrative ratio used for the Frumkin and Kim model equals administrative expense divided by total expenses. For the price and Greenlee and Brown models, the administrative ratio equals administrative expenses divided by the sum of program and administrative expenses.

a. For the price model, both the fund-raising and administrative ratios are used in log form.

\*Significant at 5% or better.

The results for the key variable of interest, the administrative ratio, using the price model, are consistently negative and robust in the two NCCS samples. The regression coefficients for the price model were −0.11 for the full sample in Table 5 and −0.06 for the restricted sample in Table 6, both highly significant. The results remain robust with further variations in the sample composition, presented in Table 7. The coefficients are negative and significant in the price model in both the full and restricted NYS and SOI samples, with coefficients ranging from −0.06 to −.011. Negative significant coefficients are found in some of the subsamples by category; positive significant coefficients are not found.

However, the choice of samples has a critical impact on the other two models. In the NCCS full sample results in Table 5, the administrative ratio coefficients are positive and significant: 0.14 for Greenlee and Brown’s (1999) model and 3.26 for Frumkin and Kim’s (2001). However, for the restricted sample regressions in Table 6, whereby our reasoning donors would be more likely to consider the ratios relevant and reliable, the coefficients change sign to become significantly negative (−1.15 and −0.21, respectively).

Table 6. Regressions of Direct Contributions–Restricted NCCS Sample

	Price Model		Greenlee and Brown (1999) Model		Frumkin and Kim (2001) Model	
Intercept	1.12*	(9.43)	13.00*	(702.16)	1.56*	(17.00)
Administrative ratio <sup>a</sup>	−0.06*	(4.68)	−1.15*	(14.74)	−0.21*	(2.64)
Fund-raising ratio <sup>a</sup>	−0.54*	(34.24)	1.02*	(8.71)		
Ln (fund-raising)	0.77*	(58.53)			0.25*	(32.67)
Ln (total assets)	0.19*	(20.04)				
Ln (government grants)	−0.02*	(15.08)			−0.03*	(18.52)
Ln (program revenue)	−0.04*	(22.62)				
Ln (other income)	−0.00	(0.53)				
Ln (age)	−0.15*	(10.1)				
Total contributions (in millions)			0.03*	(44.54)		
Ln (total revenue)					0.59*	(49.51)
Ln (program expense)					0.04*	(5.37)
N	27,496		27,602		27,580	
Adjusted R <sup>2</sup>	.40		.08		.41	

Note: NCCS = National Center for Charitable Statistics. The table lists the coefficients and the absolute values of *t*-statistics for regressions of the variables shown on the log of direct contributions for the restricted samples described in Tables 1, 3, and 4. All independent variables are measured as of the prior year.

a. For the price model, both the fund-raising and administrative ratios are used in log form. Results for the Frumkin and Kim model are shown after deleting 22 high-leverage observations. \*Significant at 5% or better.

Table 7 presents additional robustness testing. For the NYS and NCCS samples, Table 7 finds that negative significant coefficients are more likely in the restricted samples. The last column indicates the impact of restricting the NCCS sample by organization category. Although in the full NCCS samples, 2 (3) categories had positive (negative) significant coefficients in the Greenlee and Brown (1999) model and 6 (0) had positive (negative) coefficients in the Frumkin and Kim (2001) model, in the restricted regressions the coefficients were overwhelmingly negative. Six sectors had negative coefficients using the Greenlee and Brown approach, and three had them using the Frumkin and Kim approach, with only one reporting a positive significant coefficient under the Frumkin and Kim analysis. Similarly, in the NYS data, negative coefficients are more likely in the restricted samples. A positive significant coefficient for the Frumkin and Kim model becomes negative significant in the restricted sample.

The results for the SOI data do not indicate a negative significant relation. For the Greenlee and Brown (1999) model, we found insignificant positive coefficients using both models. For the Frumkin and Kim (2001) model, we found insignificant coefficients in the full model, which is consistent with

**Table 7. Regression Coefficients of Administrative Ratio by Sample**

<i>Model</i>	<i>Sample</i>	<i>Overall Results</i>	<i>Number and Sign of Categories With Significant Results</i>
<i>NCCS data</i>			
Price	Full	-0.11*	1+, 4-
	Restricted	-0.06*	0+, 3-
G&B	Full	0.14*	2+, 3-
	Restricted	-1.15*	0+, 6-
F&K	Full	3.26*	6+, 0-
	Restricted	-0.21 <sup>a</sup>	1+, 3-
<i>NYS data—1993</i>			
Price	Full	-0.10*	0+, 5-
	Restricted	-0.10*	0+, 3-
G&B	Full	-0.69*	0+, 5-
	Restricted	-1.93*	0+, 7-
F&K	Full	0.61*	1+, 1-
	Restricted	-0.70*	0+, 2-
<i>SOI data</i>			
Price	Full	-0.07*	
	Restricted	-0.06	
G&B	Full	0.38	
	Restricted	0.90	
F&K	Full	0.08	
	Restricted	0.74*	

*Note:* NCCS = National Center for Charitable Statistics; NYS = New York State; SOI = Statistics of Income; G&B = Greenlee and Brown (1999); F&K = Frumkin and Kim (2001). The overall results column presents regression coefficients for administrative ratios for three models applied to the full and restricted samples (described in Tables 1, 2, and 4). The last column summarizes the number and sign of significant administrative ratio coefficients for separate regressions by the organization categories per Table 3 for the NCCS and NYS samples. Because of sample size considerations, results by category are not presented for the SOI sample. Models: The price model follows Posnett and Sandler (1989) and Tinkelman (1999) but decomposes price into a logged administrative and a logged fund-raising ratio.

a. A small number (22) of high-leverage observations were deleted.

\*Significant at 5% or better, based on a White (1980) *t* test, for the NCCS and NYS samples. For the SOI panel, a Fama-MacBeth (1973) procedure was used.

Frumkin and Kim's original findings. When we applied their model to the restricted data, we found a positive significant coefficient of 0.74.

Comparing the NCCS, NYS, and SOI results, we believe that sample characteristics are a major cause of the difference in significance found by Greenlee and Brown (1999) and the insignificant results found by Frumkin and Kim (2001). When both models are applied to the restricted NYS data, both have negative significant coefficients. However, when applied to the SOI samples, which are far less donation-reliant, neither model detects a significant negative relation.

The results for the SOI data should be interpreted with some caution. To avoid distortions caused by using OLS on a panel of data, we employed the

Fama and MacBeth (1973) procedure. We considered, but rejected, using a random effects model because of the known presence of data errors in this sample. Marudas (2005) found that the presence of substantial measurement error in a similar panel of SOI data “implies that obtaining valid results from testing error components (fixed and random effects) models using this panel database is unlikely.” The SOI organizations, even in the restricted sample, are less likely to be those for which administrative ratios are relevant to donors. As Table 4 indicates, the restricted SOI sample is, on average, less dependent on contributions than the other two samples. In contrast, both the overall and the restricted NYS samples are more heavily dependent on donations than the others, which may explain why the largest negative coefficients are found with this sample.

Our tests considered several potential econometric issues. In general, standard multicollinearity tests did not indicate significant problems. However, when we tried adding program expense variables to the price model (not tabulated), regression diagnostics (variable inflation factors) indicated significantly increased multicollinearity. Logically, donors may get equivalent signals from high program expenses and low administrative and fund-raising ratios, so it is not surprising that including all those variables in the same regression induces multicollinearity. Multicollinearity can induce a variety of distortions, including unexpected reversals of signs. We found numerous cases where, when a program expense variable was added to the price model, the administrative ratio changed signs.

Both restricting the sample and using the log rather than the raw ratio help address potential heteroscedasticity issues. White’s specification test did not indicate significant remaining specification problems in these regressions. Each regression model contains a size control.

Two of our samples (the NCCS data and the NYS data) are only regressed for a single year, so the problems that can arise with panel data are not applicable to them. We employed the Fama-Macbeth (1973) procedure to the SOI data.

Robustness analysis (not presented) indicates that when each of the four restrictive criteria (organization age, nontrivial administrative and fund-raising spending, donations more than \$100,000 and more than 10% of revenues) is taken alone in the NCCS sample, the administrative ratio coefficients remain significant and in a narrow range of  $-0.06$  to  $-0.11$ .

Elimination of highly influential observations (using the leverage statistics computed by SAS) from the regressions had little effect, except for the results shown for the Frumkin and Kim (2001) model using the restricted NCCS data set. Although the finding of a negative coefficient for the administrative ratio was robust to excluding or including such observations, the significance level was not. If no observations are excluded, the coefficient would not be significant. The results shown in Tables 6 and 7 exclude 22 of the 27,580 observations. Varying the cut-off “leverage value” will affect the reported significance.

Our basic results are fairly, but not completely, robust to changes in functional form or variable definitions. Substituting Greenlee and Brown's (1999) definition of the administrative ratio for Frumkin and Kim's (2001) had little effect. In our NCCS sample, we noted these two measures were very highly correlated. We reran our major results for the NCCS sample using rank regression, with all variables divided into 50 ranks. As discussed above, this nonparametric form of regression is robust as long as the variables' relations are monotonic. Our results were qualitatively the same for each model. However, we also found, consistent with Jacobs and Marudas (2003), that using the log of the administrative ratio in Frumkin and Kim's model, rather than the ratio itself, was somewhat more likely to result in negative significant associations for certain categories of SOI organizations.

## CONCLUSION

Is administrative efficiency related to donations? Our results suggest "it depends" on how one encounters the complex "elephant" of the nonprofit sector.

Not surprisingly, the relevance and reliability of accounting data matter. Weaker associations exist when the data are from smaller (presumably unaudited) organizations, when the organizations are in an (unrepresentative) start-up phase, when the administrative or fund-raising ratios are too low to be plausible, or when the overall organizational figures are unlikely to reflect the donor-supported segment of the organization. Prior research, by not controlling for data relevance and reliability, may have underestimated the association between high-quality data and donations. When the samples are restricted to organizations that have fewer data quality issues, we find negative significant associations between the administrative ratios and donations, using our suggested model, as well as two different regression models used in prior research.

We believe the lack of significance in Frumkin and Kim's study, and the mixed results found by Marudas and Jacobs, are largely because of the special character of the SOI data they tested. The SOI databases are largely composed of organizations that are not donation dependent. When the same models are tested on the larger and more recent NCCS sample (or on the more donor-dependent NYS sample), restricted to organizations where the data are more likely to be relevant and reliable, negative significant associations are found.

Other econometric issues can also skew the analysis. In particular, including a control for program spending, in addition to administrative and fund-raising ratios, in some models induces significant multicollinearity.

Our study has focused on whether donations *are* associated with administrative ratios. Whether rational donors *should* focus on these ratios is another question entirely. There are reasons donors should be cautious in applying

them. First, as noted by the Urban Institute and the Center on Philanthropy at Indiana University (2004b) and others, cost allocation is subject to error and abuse, affecting the reliability and comparability of the ratios. Second, current accounting data, including the administrative expense ratio, are simply not designed to indicate organizational effectiveness in providing high-quality services to beneficiaries. Accounting expenses measure the resources the organization allocates to certain functions, not the outputs produced, nor the impact of the organization's work. Finally, the administrative expense ratio is computed using an organization's total administrative expenses and total expenses for a year and thus indicates average performance.

Basic economic theory indicates that rational donors should be concerned with the organization's use of a future marginal dollar, not its past average spending. A recent working paper (Roberts, Smith, & Taranto, 2005) suggests that marginal administrative spending may differ from past average ratios and that the behavior of the marginal administrative spending may be asymmetric to changes in total spending. In our samples, we noted that the year-to-year incremental administrative ratios (defined as the change in administrative expenses divided by the change in total expenses) were very poorly correlated with the base year administrative ratios.

Should nonprofit managers worry that extra administrative spending may result in reduced public support? The results suggest that, if the organization is primarily donation dependent and reports nontrivial administrative and fund-raising costs, donors may indeed use administrative ratios as a factor in making donation decisions. In such cases, managers need to justify to donors that the administrative spending does not detract from programs. Conversely, where the organization is primarily supported by program fees or other sources of revenues, the overall administrative ratios may be unrepresentative of how donated moneys are spent and may be ignored by donors.

## Notes

1. An intuitive explanation for the high sensitivity of first difference models to data errors, especially the incorrect recording of a balance as 0, follows. Assume that three consecutive observations should be 100, 101, and 102. The mean is 101. The first differences between the first and second observations, and between the second and third, are both 1, and their mean is 1. Now assume that the third observation was mistakenly recorded as 0. If we compare the three raw observations, they are now 100, 101, and 0, with a mean of 67. The mean is understated by about 34% from the true value of 101. The relative impact on the first differences is much higher. The two first differences are now 1 and -101, with a mean of -50, which is understated by 5,100% from the true mean of 1. The standard deviation of the first differences would also be inflated.

2. As a robustness test, we replicated our major results, using the price model, on a version of this sample that excludes certain types of organizations that have been omitted in prior studies: mutual benefit organizations, philanthropies, medical research organizations, and athletic organizations. The results were robust.



3. The age values shown are a truncated proxy for true organizational age. They represent the number of years the organization has been registered with New York State or the IRS. New York began registering organizations in 1954.

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