THE RISE OF SCHOOL-SUPPORTING NONPROFITS

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Abstract

This paper examines voluntary contributions to public education via charitable school foundations, booster clubs, parent teacher associations, and parent teacher organizations. We use panel data on school-supporting charities with national coverage from 1995 to 2010, which we geocode and match to school districts. We document the meteoric rise of school-supporting nonprofits during this panel, and then estimate a series of regression models to examine the distributional consequences of voluntary contributions. We find relatively large districts have higher probabilities of receiving revenues from a school-supporting nonprofit but the level of per-pupil voluntary contributions declines with student enrollment. In addition, we find school districts with higher endowments have higher probabilities of being served by at least one school-supporting nonprofit and higher levels of per-pupil contributions. Finally, we find no evidence that impressive recent growth in the number and financial size of these school-supporting charities relates to reductions in the public financing of schools.

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1. INTRODUCTION AND RESEARCH QUESTIONS

The recent fiscal crisis triggered major changes in the funding of K–12 public education. State tax receipts—which account for between 40 and 50 percent of revenues flowing to public schools—have declined by 12 percent in real terms since the start of the Great Recession in 2008 and constitute the sharpest decline on record (Oliff, Mai, and Palacios 2012). The 2009 American Recovery and Reinvestment Act temporarily offset these reductions in state aid by allocating $50 billion in federal stimulus to public schools, but such infusions of federal funding are unlikely to continue in light of the current fiscal and political climate (Reschovsky 2014). Johnson and Leachman (2013) find that five years following the start of the Great Recession, state tax receipts remain 5 percent lower in inflation-adjusted terms than at the start. If federal and state aid to public education continues to decline, local government revenues will play an increasingly important role in offsetting these reductions and responding to pressures for increased levels of K–12 funding.

Property taxes currently generate over 80 percent of local own-source revenues for public schools (NCES 2013; Reschovsky 2014). Local governments, however, often are unable to increase the level of property tax revenues flowing to local public schools due to state-level policies, including property tax limitations, school finance equalization measures, and categorical funding requirements mandating the allocation of local revenues. These restrictions contribute to government failure, in which the level of public education spending in many school districts is lower than what many households are willing to pay. To increase school spending to desired levels, local governments often must rely on alternatives to the property tax, such as sales taxes or voluntary contributions.

This paper examines voluntary contributions to public education as an alternative to local revenues generated via the property tax. We use panel data on charitable contributions to public school districts to answer the following research questions:

(1) How have voluntary contributions to public schools changed from 1995 through 2010?
(2) What are the distributional consequences of voluntary contributions to public schools? We address this research question by modeling both the probability that a school district receives revenues from a school-supporting 501(c)(3) charity as well as the level of per-pupil voluntary contributions as a function of school district characteristics.
(3) To what extent does variation in public school revenues from federal, state, and local sources explain variation in voluntary contributions?

The remainder of the paper is organized as follows. In section 2, we position our paper within the prior literature and the current policy context. Section 3 describes our data sources. Sections 4, 5, and 6 address research questions 1–3, and section 7 concludes.

2. REVIEW OF THE LITERATURE

Voluntary Contributions to Public Services

The topic of voluntary contributions to public services is well explored. Brunner and Sonstelie (2003) provide an excellent review of several economic models of voluntary contributions. To summarize, these models include the "pure altruism" model in which an individual's voluntary contributions reflect the purely altruistic motivation to improve the provision of public goods (see Warr 1983; Roberts 1984; Bergstrom, Blume, and Varian 1986; and Olson and Zeckhauser 1966) and joint-product models in which voluntary contributions produce both public goods and private goods benefiting the benefactor, such as "warm glow" and prestige (see Sugden 1982; Cornes and Sandler 1984; Steinberg 1987; Andreoni 1988, 1989, 1990; Ledyard 1995; Glazer and Konrad 1996; and Harbaugh 1998). Brunner and Sonstelie (2003) empirically test and find evidence for their own model of partial cooperation in which some households free-ride off the voluntary contributions of others, and increases in voluntary contributions do not keep pace with proportional increases in the beneficiary base (i.e., the elasticity of donations with respect to the number of beneficiaries is less than one).

During economic recessions, voluntary contributions may arise to address government failure to provide the desired level of public services. Even in the best of times, demand heterogeneity is natural, and devolving the choice of public services to the median voter's preference (or, in the case of tax expenditure limitations and school finance equalization, to state legislative and Supreme Court decisions) leaves some citizens unsatisfied. Because they are fairly easy to form in the United States, nonprofit organizations provide a ready vehicle for collective action wherein communities can increase spending to desired levels (Salamon 1987; Young 2000; Matsunaga and Yamauchi 2004; Lecy and Van Slyke 2013). Voluntary contributions aimed at addressing government failure may be motivated via any of the economic models described above.

The overlapping fields of public and nonprofit management explain the voluntary sector's participation in public service provision primarily through the lens of coproduction. The study of coproduction or citizen coprovision of public services began in the 1980s, during another recessionary era (see Parks et al. 1981; Brudney 1987; and Warren 1987). Traditionally,

coproduction theory characterizes the citizen provision of public services as an activity in which citizens serve as both users and agents of service provision (Whitaker 1980; Parks et al. 1981; Brudney and England 1983). Historically, such activity has been explained via theories of government failure and cross-sectoral interdependence, which create the conditions for active government encouragement of charitable activity. Examples can also be seen in the philanthropic institutions that support many public libraries, parks, and emergency services. The discussion has been renewed in recent years (e.g., Brandsen and Karré 2011; Jetté and Vaillancourt 2011; Mizrahi 2011). For example, Matsunaga and Yamauchi (2004) and Lecy and Van Slyke (2013) examine how and where 501(c)(3) charitable entities form, and what relationship they have with the characteristics of their host communities; O'Toole and Meier (2004) and Cohen (2012) examine the impact of co-production on revenue streams and tax policy. Several studies in public and nonprofit management question whether voluntary contributions form a sufficient and sustainable solution to government failure. Irvin and Carr (2005) find that voluntary contributions are a "minor and highly variable source of revenue" and "an ill-suited replacement for broad-based tax revenue" (p. 33). Similarly, Lecy and Van Slyke (2013) argue that revenues from philanthropic sources do not constitute a stable source of funding for public institutions: "foundations can be fickle patrons as they may prefer to support new organizations, new programs, and themes that evolve over time and within a community" (p. 206).

Voluntary Contributions to Public Schools

Hansen (2008) lists a broad range of nongovernmental organizations, both nonprofit and for-profit, providing revenues to schools: "school-based organizations (parent associations, alumni associations, booster clubs), school foundations, local education funds, community foundations, local businesses, independent foundations, and corporations" (p. 315).[1] Research on voluntary contributions to public schools primarily focuses on nonprofits classified as "charities" under Section 501(c)(3) of the tax code, sometimes referred to in the school context as education support organizations (e.g., Lampkin and Stern 2003). Referred to in this paper using the vernacular term "nonprofit," these school-supporting charitable organizations include parent teacher associations (PTAs), parent teacher organizations (PTOs), alumni associations, booster clubs, school foundations, and local endowments that operate at the local school or district level and form the most prevalent examples of supplementary philanthropic activity in public education (Hansen 2008). These

1. Zimmer, Krop, and Brewer (2003) use slightly different categorizations to characterize the voluntary contributions of nongovernmental organizations to California public schools.

nonprofits obtain voluntary contributions via membership dues, earned income, philanthropic gifts, and other fundraising activities, and may use these contributions to support general school and district operations or to finance programs.

School-supporting nonprofits are distinct from local education funds, community foundations, and independent foundations, which do not necessarily support K–12 public education at the local level. Local education funds "operate on a district, regional, or statewide level and act independently of the schools and districts themselves" and aim to achieve systematic education reforms rather than to provide local support for specific schools or districts (Hansen 2008, p. 317). Community foundations operate grants-based programs intended to address a broad set of community concerns and do not limit their programs to the support of public schools. Independent foundations are private philanthropic organizations that support K–12 education; independent foundations usually do not operate at a local school or district level, and funding often is allocated toward research or advocacy (Hansen 2008).

As Greene (2005) and Hansen (2008) document, there are a number of challenges in estimating the level and distribution of voluntary contributions to public education. Some studies of voluntary contributions use financial data from tax-exempt nonprofit organizations, reported to the Internal Revenue Service (IRS) on Form 990 if nonprofit revenues exceed $25,000 per year.[2] For example, Brunner and Sonstelie (2003) use IRS data from 1994 to examine voluntary contributions to California public schools, supplemented with information on nonprofit mission and type obtained from the California Registry of Charitable Trusts. Though they find voluntary contributions exceeding $1,000 per pupil in some schools and districts, average district-level contributions were measured at $145 per pupil in districts containing at least one school-supporting nonprofit that filed a Form 990. The authors conclude that "contributions are not large enough to substantially undermine school finance reform" and "[e]ven when cooperation is substantial. . .voluntary collective action is a poor substitute for the taxing authority of local government" (p. 2159). Brunner and Imazeki (2005) update the California data through 2001 and find, among districts containing at least one school-supporting nonprofit that filed a Form 990, that average per-pupil net revenues ranged from $188 in high school districts, to $274 in unified school districts, and $489 in elementary districts. Averaging across all students in California public schools, they find that net revenues per pupil increased 62.5 percent, from $24 in 1992 to $39 in 2001. The authors reach a similar conclusion that "it seems

2. The filing threshold increased to $50,000 in gross revenues in 2010.

unlikely that contributions will ever be the source of wide-scale disruptions in the distribution of revenue across communities" (p. 51).

To estimate philanthropic giving to K–12 education nationally in 2002, Greene (2005) uses IRS 990 data reported by the 30 largest K–12 independent foundations as identified by the Foundation Center, supplemented with survey data obtained from the largest 100 U.S. public school districts. He finds that philanthropic contributions accounted for between $1.5 and $2 billion in 2002, as compared to overall K–12 spending of $427 billion. Greene concludes that "most current education philanthropy is just dumping buckets of water into the ocean of public school spending" (p. 74) and that private contributions to public schools "are simply too small to significantly raise the level of resources available to schools" (p. 49).

A significant body of research suggests that voluntary contributions to public education do not constitute a viable alternative to tax revenues and are not sufficiently sizable to overcome government failure. Despite this, the Great Recession precipitated large cutbacks in state aid to public schools and spurred renewed interest in revenues obtained from nongovernmental sources. Though sparse, more recent literature suggests voluntary contributions play a growing role in financing public education. Figlio and Kenny (2009) use data on voluntary contributions obtained from surveys of Florida elementary and middle school principals in 1999–2000, 2001–02, and 2003–04, and find that voluntary contributions in these years account for about 5 percent of K–12 revenues.[3] Another recent analysis by the Public Policy Institute of California finds that voluntary contributions to California public schools—as measured by revenues reported on IRS Form 990—increased from $70 million in 1989 to $1.3 billion in 2007 (Su 2012a). Unusually large voluntary contributions (such as the $100 million donation by social media billionaire Mark Zuckerberg to create the Foundation for Newark's Future in 2010) receive substantial attention in the popular press.

Recent studies in public finance also highlight the growing importance of voluntary contributions to public education. Dye and Reschovsky (2008) find that, on average, local school districts are able to offset a dollar reduction in state aid with just 37 cents in local property taxes; similarly, Alm and Sjoquist (2009) find that Georgia school districts are able to offset every dollar reduction in state aid with 40 cents in locally raised revenues. Voluntary contributions may help public schools fill in this gap.

3. Figlio and Kenny's (2009) survey data allow them to observe total voluntary contributions, including those from organizations that do not file a Form 990 (i.e., who have gross revenues less than $25,000).

Contribution

This paper makes a number of contributions to the literature on voluntary contributions to public education. First, the paper updates the literature over the last decade using a panel of data on voluntary contributions to public schools from 1995 through 2010, a period that spans substantial variation in recessionary trends. In contrast to prior research, the paper uses panel (rather than cross-sectional) data with national (rather than statewide) coverage. The data enable a comprehensive examination of the levels and distribution of voluntary contributions over time and across districts and states. Second, this paper models both the probability that a school district receives revenues from a nonprofit, as well as the level of per-pupil voluntary contributions as a function of school district characteristics. Third, the paper examines whether changes in public school revenues from federal, state, and local property tax sources explain variation in voluntary contributions. The latter analysis examines whether and how voluntary contributions address government failure by offsetting reductions in government funding for public education.

3. DATA AND SAMPLE

Our primary data set contains 16,383 school-supporting nonprofit organizations that file annually with the IRS. We identified these organizations using the 2010 Core Public Charity files provided by the National Center for Charitable Statistics (NCCS) and maintained in the Guidestar nonprofit database, which provides subscription access to data on more than 1.8 million tax-exempt U.S. organizations. The Guidestar data include information on organization type, mission, and location, as well as Form 990 filing data and expenditure reports for nonprofits with annual revenues totaling $25,000 or more. We identified school-supporting nonprofits in the Guidestar database using keyword searches and National Taxonomy of Exempt Entities codes, developed by NCCS for classifying nonprofits according to mission.[4] We excluded from our data set any organizations that do not provide local support to schools or school districts (e.g., education nonprofits that support general education causes; private schools; serve multiple districts; or provide education services or resources at the regional, state, or national levels), organizations whose

4. Although the NCCS created the National Taxonomy of Exempt Entities (NTEE) coding protocols to provide a standardized means of identifying charitable organizations by their purpose, Guidestar assigns different codes and Gazley (2011) found that relying solely on select NTEE codes to identify these government-supporting entities was insufficient to capture all cases. In the absence of consistent identifiers, a keyword search was performed on the approximately 65,000 entities categorized under the NTEE code B for Educational Institutions (this category also includes libraries). Separately and in combination, keywords such as "friends," "education," "foundation," "school," "school district," "booster," "parent," "PTO," and "trust" were used to identify the school-supporting nonprofits.

missions do not support school or school district operations directly (e.g., organizations whose mission it is to provide college scholarships to graduating high school students), organizations without valid locational data, and organizations operationally miscategorized in Guidestar. Each organization was coded to identify whether it serves a school or school district, its type (PTA, PTO, booster, foundation, endowment, or other), and the type of school served by the organization (traditional public, magnet, charter, or private). In cases where nonprofit categorizations or addresses were ambiguous, we verified information by calling the organizations and/or cross-checking their Web sites by hand.[5]

We then linked each identified nonprofit organization to IRS panel data obtained from Form 990 filings for the years 1995 through 2010. Registered 501(c)(3) charities must file a Form 990 if their annual revenues exceed $25,000; charities with revenues falling below the filing threshold also may file a Form 990, but doing so is voluntary. Our IRS data include total revenues by year for any nonprofit that filed a Form 990. Note that we do not observe voluntary contributions to school-supporting nonprofits that do not file a Form 990, so our data most likely significantly under-report voluntary contributions to public education (Figlio and Kenny 2009).[6] We identify the presence of a school-supporting nonprofit in a given year if it reports revenues on its IRS Form 990.

Next, we used ArcGIS 10 software and school district boundary shapefiles obtained from the National Center for Education Statistics (NCES) to geocode and match 96.1 percent of the nonprofit sample to the correct NCES school district ID using the street address of the school or school district office supported by each charitable organization. Note that local education nonprofits may provide support at either the school or district levels. We are unable to precisely match nonprofits to individual schools using address data because

5. Our tabulation of school-supporting nonprofits differs from the NCCS tabulations. For example, we report 2,116 foundations in our data, compared with the NCCS estimate of 9,093 registered foundations in the education category. This discrepancy is due to definitional differences. The NCCS figures include education foundations spanning 29 categories of support, including management and technical assistance, single organization support, fundraising and fund distribution, libraries, parent teacher groups, and scholarships and student financial aid. A good example of how the NCCS data tabulations differ from ours is found within the B11 single organization support subcategory, which lists over 1,500 organizations and is composed mainly of athletic and music booster clubs. Our data tabulates these organizations separately and we do not include them within the count of school foundations. Further, the scholarships and student financial aid subcategory includes over 5,000 organizations. We exclude many of these organizations from our data set because they do not provide direct support for school or district operations (e.g., their stated missions are to provide college scholarships to graduating high school seniors).

6. Hansen (2008) notes that beginning in 2006 the U.S. Census Bureau's survey of school system finances requires school districts to report contributions and donations from private sources. Unfortunately, these data are not available for the full panel in our study and are not disaggregated by source.

school catchment zone shapefiles are not available nationally. As a result, we aggregate school-supporting nonprofit data at the school district level—even in cases where nonprofits in our data set support school-specific (rather than district-wide) activities. We view this aggregation as acceptable because revenues flowing to public schools are fungible within districts, in the sense that voluntary contributions made to particular schools may free up resources for other schools within the district.

We then used the NCES school district ID codes to merge the school-supporting nonprofit data set to national panel data on unified school districts obtained from the NCES Common Core of Data (CCD), which are available from 1999 through 2010. The CCD panel data include total enrollment, the percent of students enrolled in free and reduced-price meal programs (a measure of student poverty), and the percent of English learner students for each unified school district. We also constrain our analysis to school-supporting nonprofits that serve unified public school districts, due to difficulties in assigning nonprofits to districts in cases where district boundaries overlap (for example, in the case of overlapping elementary and high school districts) and due to differences in the funding of nonunified public school districts.[7]

We also merge our data set with NCES panel data obtained from the Local Education Agency (School District) Finance Survey (F-33) Data.[8] The F-33 data report total district revenues by funding source. We use these data to calculate state revenues per pupil, federal revenues per pupil, and property tax revenues per pupil in each year from 1999 through 2010. We use these variables to answer our third research question: To what extent does variation in public school revenues from federal, state, and local sources explain variation in voluntary contributions?

Finally, we merge our data set with panel data constructed from the school district tabulations of the 1990 Decennial Census, the 2000 Decennial Census, and the 2006–10 American Community Survey (ACS). We added the following district-level variables to our panel, intended to capture demand for school spending: the proportion of minority residents, the proportion of non-U.S. citizens, the proportion of residents above age 65, the proportion of female-headed households, the proportion of households below the poverty threshold, the unemployment rate, the proportion of the population with a bachelor's degree or higher, the homeownership rate, and the log of median household income. We used the 1990 and 2000 Decennial Censuses to

7. Charter schools are considered school districts in some states. We exclude charter school districts from our analysis due to differences in funding charter versus traditional public schools.
8. Though F-33 school finance data are available for the entire panel from 1995 to 2010, we only merge in school finance data for the years in which we also observe school district demographic data obtained from the NCES Common Core of Data (1999–2010).

Table 1. School-Supporting Nonprofits by Organization Type

Type	Number	Percent
Boosters	2,480	15.1
Foundations	2,116	12.9
Endowments	44	0.3
PTA	8,121	49.6
PTO	3,373	20.6
Other	249	1.5
Total	16,383	100.0

linearly interpolate variables to fill in data for years between 1990 and 2000. We then assigned the 2006–10, five-year ACS estimates to the year 2008 and linearly interpolated variable values between 2000 and 2008 using the 2000 Decennial Census and the five-year ACS estimates. We used the same method to linearly extrapolate data from the ACS 2008 estimates to 2009 and 2010.[9]

Due to these additional data requirements, our final analysis sample includes a total of 13,058 unique school-supporting nonprofits. We use the Consumer Price Index to transform all variables measured in dollars to inflation-adjusted 2000 dollars. To account for outliers, we winsorize variables at the 1 percent extreme values of the distribution.

4. THE RISE OF SCHOOL-SUPPORTING NONPROFITS

We first examine changes in voluntary contributions to public schools from 1995 through 2010 using our primary data set of 16,383 school-supporting nonprofits that file annually with the IRS. Table 1 displays school-supporting nonprofits by organization type. PTAs and PTOs constitute the majority (70.2 percent) of nonprofits in our data set. Booster clubs and local school foundations constitute an additional 15.1 and 12.9 percent, respectively, and school endowments and other organizations constitute a very small share (less than 2 percent).

Table 2 partitions the school-supporting nonprofits in our data set by the school type served. The vast majority of charities in our data set (93.8 percent) support traditional public schools or districts; an additional 2.6 percent of charities support public magnet schools, and 1.3 percent support public charter schools.[10]

9. As a robustness check, we also assigned the 2006–10 five-year ACS estimates to the year 2010 and re-ran all reported analyses. Results are qualitatively similar and available from the authors upon request.
10. Table 2 reports that 2.3 percent of charities in our data set support private schools. We exclude these charities from our analysis sample because they do not support public schools or districts.

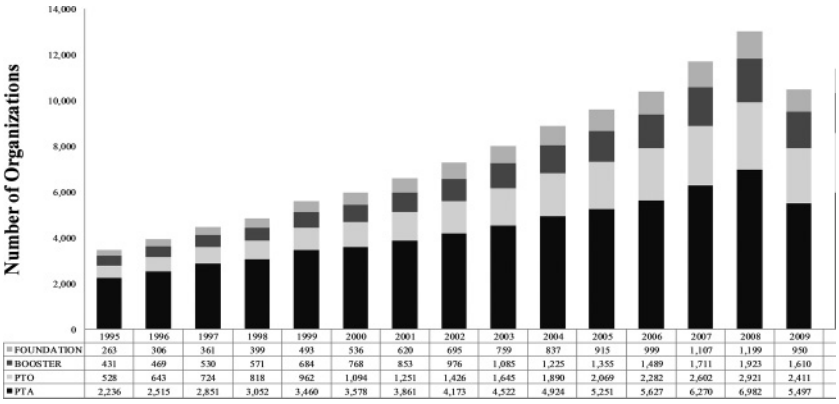
Table 2. School-Supporting Nonprofits by School Type

Type	Number	Percent
Public	15,364	93.8
Private	377	2.3
Public magnet	426	2.6
Public charter	207	1.3
Unknown	9	0.1
Total	16,383	100.0

Figure 1. Spatial Distribution of School-Supporting Nonprofits.

Figure 1 presents the spatial distribution of school-supporting nonprofits in our data set. School-supporting nonprofits in our sample have broad representation across the United States, and their geographic distribution is denser in areas with higher population density. Figure 2 illustrates tremendous growth in the number of school-supporting nonprofit IRS 990 filings from 1995–2010, overall and by organization type. Table 3 reports the corresponding percent increases in filings during the same time period, partitioned by organization type. Overall, the number of school-supporting nonprofits increased 230 percent, from 3,475 organizations in 1995 to 11,453 organizations in 2010. Further, over the same time period, the number of 990 filings increased by at least 100 percent, and the growth was more than 300 percent for PTOs, school foundations, and booster club filings.

Figure 3 illustrates the growth in total (gross) revenues reported by school-supporting nonprofits filing an IRS Form 990 from 1995 through 2010, overall and by organization type. Table 4 reports the corresponding percent increases in revenues during the same time period. Overall, school-supporting nonprofit



	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
FOUNDATION	263	306	361	399	493	536	620	695	759	837	915	999	1,107	1,199	950
BOOSTER	431	469	530	571	684	768	853	976	1,085	1,225	1,355	1,489	1,711	1,923	1,610
PTO	528	643	724	818	962	1,094	1,251	1,426	1,645	1,890	2,069	2,282	2,602	2,921	2,411
PTA	2,236	2,515	2,851	3,052	3,460	3,578	3,861	4,173	4,522	4,924	5,251	5,627	6,270	6,982	5,497

Figure 2. Time Series of School-Supporting Nonprofits by Organization Type. *Note:* The dropoff in number of filing organizations in 2009 and 2010 is most likely due to delays in filing Form 990 and to increases in the IRS Form 990 reporting threshold in 2010.

Table 3. Growth in School-Supporting Nonprofits, 1995–2010

	Organizations, 1995	Organizations, 2010	Percent increase in Organizations, 1995–2010 (%)
PTOs	528	2,601	392.6
LEFs	263	1,079	310.3
Boosters	431	1,761	308.6
Other	6	24	300.0
PTAs	2,236	5,963	166.7
Endowments	11	25	127.3
Total	3,475	11,453	229.6

revenues increased 347.7 percent—from about $197 million in 1995 to $880 million in 2010—and increased at a faster rate than nonprofit filings. Over the same time period, total revenues increased by at least 200 percent among PTOs, PTAs, school foundations, and boosters. PTOs and school foundations saw tremendous increases in total revenues, increasing over the time period by 527 and 485 percent, respectively.

Finally, table 5 reports growth in the representation of IRS-filing, school-supporting nonprofits in public school districts from 1995 through 2010. The percent of public school districts where at least one of these organizations operated increased from just 12 percent in 1995 to 29 percent in 2010. Over the same time period, the percent of school districts with a PTA or PTO increased from 9 to 20; the percent of school districts with a foundation increased from 2.2 to 8.5; and the percent of school districts with a booster club increased from 3.3 to 10.1.

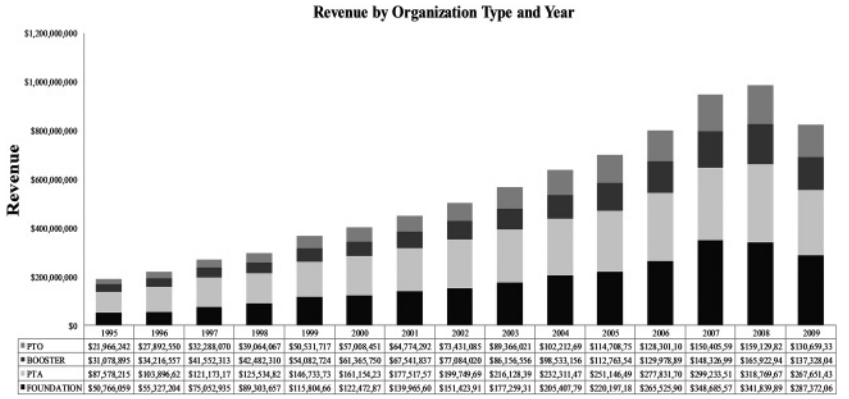


Figure 3. Time Series of School-Supporting Nonprofit Revenues by Organization Type.

Table 4. Growth in School-Supporting Nonprofit Revenues, 1995–2010

	Revenue, 1995 ($)	Revenue, 2010 ($)	Percent Increase in Revenue, 1995–2010 (%)
PTOs	21,966,242	137,713,636	526.9
LEFs	50,766,059	296,959,231	485.0
Boosters	31,078,895	148,900,391	379.1
PTAs	87,578,215	287,860,297	228.7
Other	2,736,032	5,545,986	100.7
Endowments	2,452,346	3,146,526	28.3
Total	196,604,789	880,126,067	347.7

Research on school-supporting nonprofit 990 filings has not been updated since a study by Brunner and Imazeki (2005) that relied on tax filing data available through 2001. The time trends reported in figures 2 and 3 indicate that the majority of growth in 990 filings and revenues has occurred since 2001, in the latter portion of the panel. The figure also reflects a peak in nonprofit filings and revenue levels in 2008, although the subsequent drop in tax filings and revenues observed in 2009 and 2010 may be artificial and temporary and should be interpreted with care. First, organizations that requested an extension in their filing deadline in 2009 or 2010 may not appear in our data set for those years. Second, the IRS increased the Form 990 filing threshold to $50,000 in gross revenues in 2010. As a result, nonprofit organizations with revenues falling between the 2009 threshold of $25,000 and the 2010 threshold of $50,000 may not have filed a Form 990 in 2010.[11] We address

11. In 2008 the IRS began to adjust, over three years, the threshold reporting requirements for charities to file a Form 990 or 990EZ. The most significant change for our analysis is that registered charities

Table 5. Growth in School-Supporting Nonprofit Representation, 1995–2010

Proportion of School Districts with a School-Supporting Nonprofit, by Organization Type and Year					
Year	**Any**	**PTA/PTO**	**Foundation**	**Booster Club**	**Endowment**
1995	0.1207	0.0899	0.0218	0.0326	0.0010
1996	0.1317	0.0997	0.0253	0.0353	0.0010
1997	0.1452	0.1094	0.0295	0.0391	0.0012
1998	0.1556	0.1150	0.0330	0.0424	0.0012
1999	0.1729	0.1253	0.0400	0.0488	0.0014
2000	0.1816	0.1314	0.0437	0.0545	0.0014
2001	0.1946	0.1385	0.0506	0.0584	0.0017
2002	0.2112	0.1493	0.0564	0.0653	0.0016
2003	0.2256	0.1604	0.0614	0.0714	0.0019
2004	0.2397	0.1703	0.0668	0.0780	0.0020
2005	0.2530	0.1781	0.0726	0.0848	0.0020
2006	0.2692	0.1879	0.0785	0.0909	0.0022
2007	0.2920	0.2034	0.0868	0.1004	0.0023
2008	0.3109	0.2161	0.0938	0.1090	0.0024
2009	0.2718	0.1930	0.0754	0.0943	0.0020
2010	0.2885	0.2007	0.0849	0.1014	0.0023

this sample truncation issue by excluding observations from 2010 in our subsequent empirical analyses.

5. DISTRIBUTIONAL CONSEQUENCES OF NONPROFIT CONTRIBUTIONS

In this section, we examine the distributional consequences of voluntary contributions to public schools. The presence of school-supporting nonprofits and the level of voluntary contributions to public schools are not uniform. The uneven distribution of charitable resources enables us to examine demand heterogeneity across school districts and associated equity implications, including whether the distribution of nonprofit revenues results in funding inequalities. To answer these questions, we use panel data on school-supporting nonprofits linked to a complete panel of unified school district data for the years 1999 through 2009, in which we observe school district data obtained from the NCES CCD, the Local Education Agency (School District) Finance

with annual gross receipts of $25,000 or more and assets of $1,250,000 or more were required to file a 990 or 990EZ in 2009. That threshold changed to $50,000 in receipts or $500,000 in assets in 2010. All else equal, a higher reporting threshold will deflate the growth in revenues and in numbers of school-supporting charitable organizations reported in our trend data.

Survey (F-33), the Decennial Census, and the ACS. Excluding observations from 2010 in our sample due to changes in 501(c)(3) IRS filing requirements, our final analysis sample includes 13,058 unique school-supporting nonprofits that meet the criteria for sample inclusion described in section 3.

Empirical Strategy

We first model the probability that a unified school district receives revenues from a school-supporting 501(c)(3) charity as a function of time-varying school district characteristics: the log of state revenues per pupil, the log of property tax revenues per pupil, the log of federal revenues per pupil, the proportion of English learner students, the proportion of students enrolled in free and reduced-price meal programs, the log of district enrollment, the proportion of minority residents, the proportion of non-U.S. citizens, the proportion of residents above age 65, the proportion of female-headed households, the proportion of households below the poverty threshold, the unemployment rate, the proportion of the population with a bachelor's degree or higher, the home-ownership rate, and the log of median household income.

We begin with the following reduced form model:

$$Y_{dt} = \beta X_{dt} + \eta_t + \varepsilon_{dt}. \tag{1}$$

The dependent variable is a dichotomous variable indicating whether district d receives any revenues from a school-supporting 501(c)(3) charity in year t (i.e., whether any organization files an IRS Form 990 in the district in a given year), X is a set of time-varying district characteristics, η denotes year fixed effects and captures systematic differences in IRS filings over time, and ε denotes the random error term. The coefficient β is the average effect of that district characteristic on the probability of the district having at least one school-supporting nonprofit in a given year. The model coefficients β are descriptive and not causal, because unobserved district characteristics are likely to be correlated with both the observed district characteristics (X) and with whether any organization files an IRS Form 990 in the district (Y). Thus, omitting these variables is likely to bias estimates of the effects of district characteristics on our dependent variable of interest. We estimate a linear probability model using ordinary least squares (OLS) and robust standard errors to account for heteroskedasticity resulting from the application of OLS techniques to limited dependent variables. We also cluster standard errors by district in all models to correct for within-district serial correlation of the errors; we assume independence of between-district errors.

A major benefit of using panel data for our analysis is that it enables us to reduce bias in our estimated coefficients by including a rich set of fixed effects

to control for time-invariant observed and unobserved variation nested within units. Our data have broad national coverage and span eleven years, so we are able to modify equation 1 to include additional fixed effects:

$$Y_{dt} = \beta X_{dt} + \gamma_d + \eta_t + \varepsilon_{dt}. \quad (2)$$

In equation 2, γ denotes a set of fixed effects, which may be specified at either the state level s or at the school district level d. The fixed effects model reduces bias associated with time-invariant observed and unobserved differences in states (districts) that may be correlated with both the time-varying district characteristics and our dependent variable. Although this model reduces bias due to systematic differences in district characteristics across states (and in district characteristics over time), the estimated β coefficients may still be biased due to time-varying unobservables at the state (district) level. The inclusion of school district fixed effects in equation 2 requires that the β coefficients are estimated using within-district variation in district characteristics, and net of time trends. Such a parameterization reduces bias but is likely to yield relatively imprecise estimates of β. Alternatively, a less restrictive parameterization with fixed effects at the state level will yield β estimates that are more precise but relatively biased.[12]

Results: Probability of Receiving Revenues from a School-Supporting Nonprofit

Table 6 reports results from our linear probability regressions modeling on whether a unified school district receives revenues from a school-supporting 501(c)(3) charity. Model I displays the reduced form estimates, model II displays results including state fixed effects, and model III displays results including school district (rather than state) fixed effects.

Coefficients on the year fixed effects confirm the descriptive trends in table 5. In the district fixed effects model, the probability that a school district receives revenues from any school-supporting nonprofit increases monotonically from 1999 through 2008, before dropping off in 2009, and the probability is 0.088 higher in 2008 as compared to the 1999 baseline year.[13]

In the reduced form, state fixed effect, and district fixed effect models, the probability that any school-supporting nonprofit files an IRS Form 990 is significantly higher in districts with higher property tax revenues per pupil,

12. Linear probability models are prone to problems arising from unbounded predicted values. As we observe in our models, estimated coefficients may take on values that are greater than one and less than negative one. However, we prefer the OLS specification to the standard logit or probit specification because it is not prone to the incidental parameters problem encountered when using maximum likelihood techniques in combination with fixed effects. In untabulated results, we run probit specifications without fixed effects to test the robustness of our reduced form estimates to nonlinear transformations. We obtain qualitatively similar results.

13. As we discuss in section 4, part of the decline in 2009 may be due to delays in IRS tax filings.

Table 6. The Distribution of School-Supporting Nonprofits and Revenue

	DV: Any Organization			DV: Log of Per-Pupil Voluntary Contributions		
	I	II	III	IV	V	VI
	Reduced Form	State FE	District FE	Reduced Form	State FE	District FE
Log of state revenues per pupil (in $100)	−0.010	0.025*	−0.009	−0.398***	−0.018	0.005
	(0.011)	(0.012)	(0.009)	(0.050)	(0.058)	(0.040)
Log of property tax revenues per pupil (in $100)	0.019**	0.048***	0.024**	−0.230***	0.115*	0.051
	(0.007)	(0.009)	(0.008)	(0.043)	(0.056)	(0.055)
Log of federal revenues per pupil (in $100)	−0.015	−0.007	−0.003	0.128*	0.126*	0.050
	(0.009)	(0.009)	(0.006)	(0.053)	(0.049)	(0.027)
Proportion of English learner students	0.333***	0.267***	0.094*	0.322	−0.054	−0.013
	(0.056)	(0.062)	(0.040)	(0.429)	(0.439)	(0.230)
Proportion of free/reduced lunch students	−0.042	−0.088*	−0.037	0.466	−0.035	−0.252
	(0.038)	(0.040)	(0.029)	(0.278)	(0.287)	(0.164)
Log of enrollment	0.181***	0.183***	0.167***	−0.283***	−0.307***	−0.618*
	(0.004)	(0.005)	(0.030)	(0.025)	(0.027)	(0.250)
Proportion minority	−0.001**	−0.001	0.002	−0.008***	−0.012***	0.006
	(0.000)	(0.000)	(0.001)	(0.003)	(0.003)	(0.007)
Proportion aged 65 and over	0.010***	0.009***	0.006	0.053***	0.053***	−0.005
	(0.001)	(0.001)	(0.004)	(0.009)	(0.009)	(0.022)
Proportion female head of households	−0.003**	−0.001	−0.002	−0.003	0.019*	0.003
	(0.001)	(0.001)	(0.002)	(0.008)	(0.008)	(0.009)
Proportion below poverty line	0.001	0.002	0.003*	0.019*	0.023**	−0.007
	(0.001)	(0.001)	(0.001)	(0.009)	(0.009)	(0.012)
Proportion unemployed	−0.001	−0.003**	0.000	−0.029***	−0.025***	0.010
	(0.001)	(0.001)	(0.001)	(0.006)	(0.006)	(0.009)
Proportion non-U.S. citizens	−0.002	−0.003**	−0.003	0.009	0.017	0.010
	(0.001)	(0.001)	(0.002)	(0.009)	(0.009)	(0.015)
Proportion with bachelor's degree or higher	0.006***	0.007***	0.005***	0.024***	0.022***	0.007
	(0.001)	(0.001)	(0.001)	(0.003)	(0.003)	(0.007)
Proportion homeowners	−0.004***	−0.002***	−0.000	−0.008*	−0.004	−0.009
	(0.001)	(0.001)	(0.001)	(0.003)	(0.004)	(0.009)
Log of median household income	0.240***	0.200***	0.079	0.837***	0.902***	0.844*
	(0.040)	(0.045)	(0.058)	(0.235)	(0.256)	(0.406)
2000	−0.011	0.001	0.004	0.023	0.048	0.083**
	(0.006)	(0.005)	(0.005)	(0.035)	(0.031)	(0.030)
2001	−0.019**	−0.008	0.005	0.048	0.066	0.143***
	(0.007)	(0.007)	(0.007)	(0.039)	(0.038)	(0.038)
2002	−0.003	−0.000	0.019*	0.042	0.093*	0.200***
	(0.009)	(0.009)	(0.009)	(0.047)	(0.046)	(0.053)
2003	−0.003	−0.001	0.030**	0.085	0.137*	0.272***
	(0.010)	(0.011)	(0.011)	(0.055)	(0.056)	(0.069)

Table 6. The Distribution of School-Supporting Nonprofits and Revenue

	DV: Any Organization			DV: Log of Per-Pupil Voluntary Contributions		
	I Reduced Form	II State FE	III District FE	IV Reduced Form	V State FE	VI District FE
2004	0.001	−0.000	0.038**	0.178**	0.205**	0.360***
	(0.012)	(0.013)	(0.013)	(0.065)	(0.067)	(0.086)
2005	−0.001	−0.003	0.042**	0.236**	0.230**	0.430***
	(0.014)	(0.015)	(0.016)	(0.077)	(0.080)	(0.104)
2006	0.000	−0.001	0.053**	0.301***	0.300**	0.513***
	(0.016)	(0.017)	(0.019)	(0.087)	(0.091)	(0.121)
2007	0.009	0.010	0.073***	0.344***	0.342***	0.594***
	(0.018)	(0.020)	(0.021)	(0.099)	(0.104)	(0.139)
2008	0.009	0.016	0.088***	0.327**	0.325**	0.623***
	(0.021)	(0.023)	(0.024)	(0.114)	(0.120)	(0.157)
2009	−0.041	−0.037	0.034	0.131	0.184	0.460**
	(0.024)	(0.026)	(0.027)	(0.131)	(0.136)	(0.171)
Constant	−3.483***	−3.736***	−2.162**	0.468	−6.273*	−1.981
	(0.431)	(0.503)	(0.701)	(2.407)	(2.692)	(4.575)
Observations	37,886	37,886	37,886	13,938	13,938	13,938
Pseudo-R^2	0.445	0.463	0.079	0.272	0.331	0.213
R^2	0.444	0.463	0.079	0.271	0.328	0.211

Note: Standard errors in parentheses. DV = dependent variable; FE = fixed effect.
***Statistically significant at the 1% level; **statistically significant at the 5% level; *statistically significant at the 10% level.

higher enrollments, higher proportions of English learner students, and higher shares of residents with at least a bachelor's degree. The probabilities generally are less variable within districts over time, as we observe in the more restrictive district fixed effects model; estimated coefficients remain positive and statistically significant, however.

Coefficients on other school district characteristics are less consistent across model specifications. For example, the share of senior residents and district median household income levels are associated with significantly higher probabilities of receiving revenues from a school-supporting nonprofit, but only in the reduced form and state fixed effects models; within-district variation may not be sufficiently large over time to identify the effect precisely in the district fixed effects model. State revenues per pupil are associated positively and significantly with the probability of receiving revenues from a school-supporting nonprofit in the state fixed effects model. In the district fixed effects model, higher shares of residents living below the poverty line

also are associated positively and significantly with the probability of a district being served by a nonprofit organization. The proportion of female-headed households is associated with significantly lower probabilities of receiving school-supporting nonprofit revenues in the reduced form model but the effect is not statistically significant in the state or district fixed effects models. Finally, the share of students in poverty (as measured by enrollment in free- and reduced-price meal programs), the proportion of non-U.S. citizens, the unemployment rate, and the homeownership rate are associated with significantly lower probabilities of receiving school-supporting nonprofit revenues in the state fixed effect models, but the effects are not statistically significant in the reduced form or district fixed effects models.[14]

Taken together, the results indicate that relatively large districts with higher property tax (local, own-source) revenues per pupil, higher state revenues per pupil, relatively educated and wealthy residents, lower unemployment, and lower shares of students in poverty, female-headed households, and non-U.S. citizens, have higher probabilities of receiving revenues from a school-supporting nonprofit. The coefficient estimate signs, magnitudes, and statistical significance are consistent with the theory that communities with larger endowments exhibit a greater capacity to co-produce public services and address government failure.[15]

Results: Modeling the Level of Per-Pupil Voluntary Contributions

We next turn to modeling the level of per-pupil voluntary contributions at the district level as a function of school district characteristics. We adapt the reduced form and fixed effects specifications in equations 1 and 2, changing the dependent variable *Y* from a dichotomous outcome to a continuously defined measure of the log of nonprofit revenues per pupil, calculated using total revenues across all nonprofits in the school district and dividing by the total number of enrolled students. We estimate our models using OLS. Because our dependent variable is no longer dichotomous, we no longer encounter problems in interpreting unbounded predicted coefficients. In addition,

14. In untabulated results, we also model separately the probabilities that school districts receive revenues from any PTA/PTO, booster club, or school foundation. Results from the reduced form, state fixed effect, and district fixed effect specifications are qualitatively similar to those reported in table 6, especially for the set of regressions modeling the probability that school districts receive revenues from any PTA/PTO (the most ubiquitous form of school-supporting nonprofit organization in our data set). Results are available from the authors upon request.

15. It is more difficult to interpret the positive coefficient on the proportion of English learners in all model specifications, the positive coefficient on the share of senior residents in the reduced form and state fixed effects models, the positive coefficient on the share of residents below the poverty line in the district fixed effects regression, and the negative coefficient on homeownership rate in the reduced form and state fixed effects regressions. These variable relationships generally are not associated with greater capacity, and additional research on demand heterogeneity is needed to explain these results.

heteroskedasticity is of less concern with a continuously defined dependent variable (though we continue to use robust standard errors in our models and to cluster the errors by district to correct for serial autocorrelation).

We run our district-level models of per-pupil revenue conditional on the sample of districts that received revenues from a school-supporting organization (i.e., the sample of districts for which the dependent variable was equal to one in our first set of regressions in table 6). This specification raises two issues. First, our data are left-censored because we do not observe revenues from school-supporting nonprofits that do not file with the IRS, and so (1) our analysis sample is likely to be truncated and (2) we are likely to underestimate total per-pupil nonprofit revenues (Figlio and Kenny 2009). We are unable to use a Tobit specification to account for this censoring, however, because the likelihood estimator for fixed effects is biased and inconsistent. Second, the selection of school districts into our sample is nonrandom and will lead to biased coefficient estimates, but we are unable to use the results from our first set of regressions in table 6 in a standard Heckman selection model because we do not observe variables in our data set that form a valid exclusion restriction. Therefore, coefficient estimates should be interpreted with caution as descriptive rather than causal.

Table 6 also reports our results modeling the log of per-pupil voluntary contributions. Model IV displays the reduced form estimates, model V displays results including state fixed effects, and model VI displays results including school district (rather than state) fixed effects. Coefficients on the year fixed effects confirm the time trends reported in table 4. Per-pupil voluntary contributions increase monotonically in each year from 1999 through 2008 (and decline slightly in 2009). Notably, the time trends are the most sizable and statistically significant in the district fixed effects regression, suggesting that time trends within districts explain large differences in voluntary contributions. The district fixed effect regression suggests that within districts, average per-pupil voluntary contributions increased by 62.3 percent from 1999 through 2009.

Our results also provide support for Brunner and Sontelie's (2003) model of partial cooperation, which posits that the marginal price of voluntary contributions increases with the number of students enrolled in the district. Using California data, Brunner and Sonstelie (2003) find a negative cross-sectional relationship between per-pupil donations and enrollment, and Brunner and Imazeki (2005) confirm this relationship using an updated panel data set but without additional controls. In our data set, which includes national panel data from 1999 through 2009, we find a sizable and statistically significant negative relationship between per-pupil voluntary contributions—as measured by the revenues reported by nonprofits filing IRS Form 990—and the log of district enrollment in our reduced form and fixed effects models.

In our models of per-pupil voluntary contributions, coefficients on the remaining time-varying district characteristics shed additional light on the distributional consequences of nonprofit contributions. In all specifications, we find a positive and statistically significant relationship between median household income and the level of per-pupil voluntary contributions; we also find the share of residents with at least a bachelor's degree positively and significantly predicts per-pupil voluntary contributions in both the reduced form and state fixed effects specifications. In the reduced form and state fixed effects specifications, we also find the unemployment rate and the share of minority residents negatively and significantly predict per-pupil voluntary contributions. These coefficient estimates also are consistent with the theory that communities with larger endowments exhibit a greater capacity to coproduce public services and address government failure.[16]

Interestingly, the reduced form model finds state revenues per pupil and property tax revenues per pupil negatively and significantly predict per-pupil voluntary contributions, and federal revenues per pupil positively and significantly predict per-pupil voluntary contributions. The coefficient on state revenues per pupil is insignificant in both the state and district fixed effects models, however, whereas the coefficient on property tax revenues per pupil becomes positive and statistically significant in the state fixed effects model, and the coefficient on federal revenues per pupil remains positive and statistically significant in the state fixed effects model. In other words—after accounting for time-invariant, cross-state differences in local, state, and federal contributions to public schools—we find school districts with higher local own-source revenues and higher federal funding on a per-pupil basis generate larger average voluntary contributions. Within districts, however, increases in property tax revenues and federal revenues over time do not predict variation in per-pupil voluntary contributions.

Summary of Main Results

Taken together, the results indicate substantial growth in both the presence of school-supporting nonprofits and in the level of per-pupil voluntary contributions from 1999 through 2009. We also find that school districts with higher endowments—as measured by property tax revenues per pupil, the share of individuals with a bachelor's degree or more, median household income, and relatively low unemployment rates—have higher probabilities of

16. It is more difficult to interpret the positive coefficients on the share of senior residents and on the share of residents below the poverty line in the reduced form and state fixed effects models, the positive coefficient on the share of female-headed households in the district fixed effects regression, and the negative coefficient on homeownership rate in the reduced form model. These variable relationships generally are not associated with greater capacity, and additional research on demand heterogeneity is needed to explain these results.

being served by at least one school-supporting nonprofit and higher levels of per-pupil contributions. We also find that while school districts with relatively high student enrollments have higher probabilities of being served by a school-supporting nonprofit, the level of per-pupil voluntary contributions declines with enrollment.

We also find no evidence that voluntary contributions offset reductions in the public financing of public schools. In fact, we find the opposite in our state and district fixed effects models: School districts with higher levels of per-pupil state and property tax revenues have a higher probability of being served by a school-supporting nonprofit, and school districts with higher per-pupil revenues from property tax and federal sources generate higher average levels of per-pupil voluntary contributions. Collectively, these findings imply voluntary contributions do not constitute an efficient or stable substitute for the financing of K–12 public education. Rather, they serve to enhance spending in school districts that already receive significantly larger per-pupil revenues.

6. ARE VOLUNTARY CONTRIBUTIONS STILL BUCKETS INTO THE SEA?

We now revisit the question of whether the rise in voluntary contributions is sufficiently substantial to change the distribution of funding across school districts. We first aggregate total school-supporting nonprofit revenues across all unified public school districts in the United States and divide this figure by total student enrollment in these districts. At the beginning of our panel in 1995, per-pupil voluntary contributions in the United States were $3.67; by 2010, the amount increased to $20.31. Conditioning on only those unified school districts with at least one school-supporting nonprofit, we find average per-pupil voluntary contributions of $8.02 in 1995, a figure that grew to $28.38 in 2010.[17] Despite this tremendous growth, voluntary contributions to public schools—as measured by IRS Form 990 filings—remain a small fraction of total per-pupil dollars spent on public education. In 2010, U.S. K–12 public schools spent an average of $10,615 per student (Dixon 2012).

Unfortunately, the 2010 changes in IRS Form 990 filing requirements will complicate future attempts to examine changes in voluntary contributions to public schools using a consistent source of data. However, relatively new sources of data on voluntary contributions, such as the U.S. Census Bureau's survey of school system finances that began in 2006, may reveal significantly higher levels of voluntary contributions than are observed when relying on IRS Form 990 data.[18]

17. We report all dollar figures using inflation-adjusted 2000 dollars.
18. Figlio and Kenny (2009) discuss the limitations of IRS Form 990 data in producing accurate estimates of voluntary contributions to public schools.

Finally, our low average levels of per-pupil voluntary contributions belie the influential effect of school-supporting nonprofit activity *within* districts, where voluntary contributions may have sizable effects on the particular students or programs that benefit disproportionately from such funding.[19] Recent anecdotal evidence suggests school districts are concerned increasingly with the uneven distribution of nonprofit revenues across schools. For example, California's Santa Monica-Malibu, Manhattan Beach, and Palo Alto school districts recently adopted policies to pool voluntary contributions at the district level for redistribution across all schools (Su 2012b).

7. CONCLUSION

In recent years, considerable scholarly and practitioner discussion has focused on the role of coproductive and philanthropic activity in public service provision. Our trend data make it clear that communities depend increasingly on philanthropic revenue to support public education. From 1995 to 2010, nonprofit revenues increased nearly 350 percent and totaled $880 million in 2010. Our findings also generally indicate relatively large districts have higher probabilities of receiving revenues from a school-supporting nonprofit but the level of per-pupil voluntary contributions declines with student enrollment. In addition, we find school districts with higher endowments—as measured by property tax revenues per pupil, the share of individuals with a bachelor's degree or more, median household income, and relatively low unemployment rates—have higher probabilities of being served by at least one school-supporting nonprofit and higher levels of per-pupil contributions. Finally, we find no evidence that impressive recent growth in the number and financial size of these school-supporting charities relates to reductions in the public financing of schools. Instead, we find school districts that generate higher revenues from federal and property tax sources also generate higher revenues from voluntary contributions.

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19. Low average levels of per-pupil funding also may belie the influential effect of school-supporting nonprofit activity *across* districts that may only be observed in a less parametric context (e.g., in quintile regressions). We leave this possibility to future research.

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