Do Tax Incentives Affect Charitable Contributions? Evidence from Public Charities' Reported Revenues

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Abstract

This paper estimates the effect of the charitable contribution deduction on public charities' donation revenue. The effect is identified by exploiting variation in the change in tax incentives across US states following the federal Tax Reform Act of 1986. At the margin, a one percent increase in the tax cost of giving causes charitable receipts to fall by about four percent, a larger effect than has usually been found in the literature using household data. This result does not reflect intertemporal substitution and is robust to a variety of checks. Further analysis reveals that the effect is stronger for some sectors, notably health charities, and is driven by upper-income households. Tax reform proposals limiting upper-income households' charitable contribution deduction would sharply reduce some charities' contribution revenue.

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1 Introduction

Private nonprofit organizations provide many crucial services in the US. They grant 30 percent of bachelor's degrees, make 69 percent of hospital admissions, and supply nearly 100 percent of religious services. Private nonprofits make up 71 percent of museums and 89 percent of emergency shelters and soup kitchens. These organizations are supported in part by donors' gifts; in 2012, charitable giving was equal to 2.0 percent of gross domestic product.[1]

Without the nonprofit sector, many of these goods and services would likely be supplied by the government. Instead of direct state provision, American governments indirectly support nonprofits by exempting them from many income and property taxes that for-profit firms are obliged to pay. Additionally, organizations which serve particular causes can be registered as public charities under section 501(c)3 of the Internal Revenue Code.[2] Donations to public charities can be taken as itemized deductions on households' tax returns, reducing the donors' income tax.

This additional tax benefit to donors is meant to increase charitable giving (and avoid the need to supply more services via taxation). However, the effectiveness of this incentive is subject to debate. In the philanthropic world, it has become a stylized fact that charitable giving is fixed at about two percent of gross domestic product, regardless of tax rates.[3] Figure 1 plots the ratio of total estimated giving to GDP over time. Even as the top marginal tax rate fell from 91 percent at the close of the Second World War to 28 percent in 1988 (before rising to 39.6 percent today), total contributions have indeed remained steady at roughly two percent of GDP since 1955, and both major political parties have put forward proposals to increase tax revenue from high-income households by limiting the charitable contribution deduction.[4] Yet, a large empirical literature has found a range of behavioral responses to tax incentives in household data. Peloza and Steel (2005) analyze 70 studies of the

[1] Sources: U.S. Department of Education, National Center for Education Statistics, *The Condition of Education 2013*; American Hospital Association, *AHA Hospital Statistics*, 2012; Institute of Museum and Library Services, *Exhibiting Public Value: Government Funding for Museums in the United States*, 2008; U.S. Bureau of the Census, National Survey of Homeless Assistance Providers and Clients (1999); Giving USA (2013); Bureau of Economic Analysis.

[2] Public charities are a subset of nonprofit organizations. Other types of nonprofit organization enjoy a wide variety of tax subsidies, such as exemption from most income and property taxes paid by for-profit firms, while only public charities and private foundations can receive tax-deductible contributions. Examples of tax-exempt nonprofit organizations that cannot accept tax-deductible contributions include social welfare groups, political organizations, homeowners' associations, and some professional sports leagues. See Hopkins (2007, §1.2-1.3).

[3] See for example the June 17 2013 *Chronicle of Philanthropy*, "The Stubborn 2% Giving Rate," or Dec. 12 2012 *Wall Street Journal* "A Christmas Wish for Charities."

[4] An Obama administration budget proposal would have limited the rate for the contribution deduction to 28 percent, so that taxpayers in the top 39.5 percent bracket would still owe 11.5 percentage points (39.5-28=11.5) to the federal government on income given to charity (Bowley 2013, Donovan and Perry 2013). A counterproposal by Republican senators would have capped all itemized contributions at two percent of income, including charitable contributions Feldstein (2013).

tax elasticity of charitable giving, and tabulate estimates ranging from 0 to -7 (that is, from no effect to a very large effect), with a median estimate of about -1.2. The importance of the charitable contribution tax deduction to charities therefore remains an unsettled question.

This paper provides new evidence on this question using the Tax Reform Act of 1986 (TRA86), which completely overhauled the federal tax code, including a reduction of the top marginal income tax rate from 50 percent to 28 percent and the elimination or modification of several deductions. Tax rates determine the "price" of giving to charity, because giving $1 to a charity costs an itemizing taxpayer only $1–$\tau$ in after-tax personal consumption, where τ is the marginal tax rate.[5] A tax cut is therefore equivalent to a price increase in the cost of charitable giving, and can help to identify the importance of this incentive for donors.

Federal and state tax laws interact in myriad ways, such as states' reuse of federal tax definitions, or the deductibility of state tax from federal taxable income (and sometimes vice versa). I demonstrate that preexisting differences among state income tax laws resulted in substantial differences across states in the change in overall tax cost of giving following the radical revision of the federal tax code. For example, under 1986 tax law, donors in Kansas and in North Carolina both faced a tax cost of giving of about $0.67 ($1 minus a 33 percent average marginal tax rate). In 1988, after the TRA86 was fully phased in, the tax cost rose to $0.82 in Kansas, but to just $0.78 in North Carolina. The $0.04 differential is caused by differences in the state income tax systems preceding the federal reform. I show that changes across states in tax cost of charitable giving are uncorrelated with the tax cost of giving before the federal reform.

I exploit these tax cost changes using a panel of reported contributions from charitable organizations' Internal Revenue Service (IRS) filings, the federal form 990. I find that a one percent change in the tax cost of giving following the TRA86 causes about a four percent decline in charitable contribution receipts. Extensions of the analysis demonstrate that pre-trends in charitable giving or intertemporal shifting behavior do not drive these results. Further checks confirm that these results are not driven by sample selection bias, entry and exit of organizations, extensive margin outcomes, endogenous policy changes, or outliers. Such elasticities imply a larger tax-sensitivity of charitable giving than is apparent in the aggregate data or than has been reported by most studies using household data.

This greater tax-sensitivity can be explained by heterogeneous responses of donors and charities alike to tax

[5]For example, with a tax rate of 36 percent, an itemizing tax payer can give $1 to a public charity, or could pay the tax authority 36 cents and keep 64 cents for herself. So by reducing the top marginal rate from 50 percent to 28 percent, the TRA86 increased the federal tax cost of giving $1 to charity among top-bracket itemizing taxpayers from 50 cents to 72 cents, the amount of after-tax income the household could otherwise keep for personal use.

incentives, and differences in the composition of available data sources. Household tax data only permits analysis of returns with an incentive to report their contributions (generally, higher income households with sufficient deductions to file Schedule A). The IRS does not require some major charitable sectors, particularly churches, to file a form 990, and my identification strategy requires a focus on local rather than nationally prominent charities. The discrepancy between my estimates and the household literature is consistent with the prior literature on heterogeneous tax sensitivity by household income and by church/non-church charities. Further analysis of the form 990 sample reveals that the effect of the 1986 tax change on charitable contributions is more important for some charities than others, particularly health-related causes, and that the behavior of upper-income households appears to drive variation in giving.

It is the importance of upper-income households for charitable giving that explains the apparent stability of the contributions-to-GDP ratio over the postwar era. Even as tax rates have fallen, the share of national income going to the top earners has risen, offsetting the negative incentive effect with a positive income effect. In no decade were either of these trends as pronounced as in the 1980s. For some local, 990-filing charities, tax incentives to give are very powerful. Understanding the differences in incentive effects across donors and charities is important for interpretation of charitable giving elasticities and for predicting likely outcomes of future tax reforms.

2 Charitable Contributions and the US Tax System

The charitable contribution deduction was added to the federal tax code by the War Revenue Act of 1917. The federal government sharply increased the burden of the federal income tax on high-income households as the US prepared to enter the First World War, increasing the top marginal rate from 15 percent to 67 percent. An amendment to the 1917 tax act was introduced by Senator Henry F. Hollis of New Hampshire (who also happened to be a regent of the Smithsonian Institution), allowing up to 15 percent of income to be given without tax to "corporations or associations organized and operated exclusively for religious, charitable, scientific, or educational purposes, or to societies for the prevention of cruelty to children or animals" (Congressional Record v. 55 pt. 7 p. S6741). Charitable giving is a luxury good, Hollis argued, and "usually people contribute to charities and educational objects out of their surplus. After they have done everything else they want to do…they will contribute it to a college or to the Red Cross or for some scientific purpose." Therefore, at the margin, high-income households will maintain their own consumption first, and "when war comes and we impose these very

heavy taxes on incomes, [charity] will be the first place where the wealthy men will be tempted to economize" (C.R. v. 55 pt. 7 p. S6729).

Hollis's amendment was accepted quickly and unanimously. The brief Congressional debate on the matter, however, presaged a long scholarly one: is the Senator's fear that charitable contributions respond to taxation empirically relevant? The literature estimating individual donors' response to tax incentives is large and long, but a consensus on the effect the deduction has on charitable giving remains elusive. A meta-analysis by Peloza and Steel (2005) tabulates 70 peer-reviewed studies, most estimating a tax elasticity of charitable contributions between -4 and 0, with a median of about -1.2.

One problem with individual tax return data is correctly parsing observed changes in permanent giving and shifting of giving across years to maximize the tax benefit of anticipated rate changes. Using panel data, Randolph (1995) finds that most of the tax response is temporary shifting, with a permanent giving tax elasticity of about -0.5, while Auten et al. (2002) find a permanent elasticity of -1.2, with a small temporary response. Because a household's income and its tax rate are highly correlated, panel data analysis requires strong assumptions about the comparability of tax changes across time and across income groups; see the discussion of estimation issues in Andreoni (2006) and Bakija and Heim (2011). In addition to shifting of contributions across years, survey data with information on volunteering has found that tax subsidies do not drive away donors, but instead affect the substitution between commitments of time (volunteering) and money (Gruber 2004, Feldman 2010).

Individual tax filing data also measures actual charitable giving with error. Itemizers overstate their contributions to evade taxation (Slemrod 1989, Fack and Landais 2010), while non-itemizers have no incentive to report contributions at all, underreporting their donations (Dunbar and Phillips 1997, Duquette 1999). Survey datasets avoid the financial incentives to overstate or not report one's contributions, but can be costly to gather and may have their own errors and biases (*e.g.* if people do not recall their contribution amounts accurately, or overstate them to impress the survey-taker).

These problems with identification and measurement have motivated experimental approaches to the study of altruistic giving. Charitable giving experiments vary the cost of making a contribution through matching grants in a randomized fundraising campaign. For example, Karlan and List (2007) solicit donations from potential contributors with a randomized matching grant that will contribute an additional $1, $2, or $3 for every dollar contributed by the solicited donor (making the cost of a $1 contribution $0.50, $0.33, and $0.25, respectively) and find no effect on contributions from varying the match. Other experiments have found that varying a match does affect donations (Huck and Rasul 2011, Karlan et al. 2011), though as in studies of tax data, there is some

evidence that lowering the cost of giving through a match may just induce donors to shift their donations across time (Meier 2007) or across charities (Konow 2010) rather than increase total giving. Karlan et al. (2011) and List (2011) provide overviews of this literature.

By demonstrating the importance of factors like charitable solicitation and leading grants, experimental approaches have revealed much about altruistic decisions, but our understanding of the effects of tax rates (or other changes in cost) on charitable giving is still murky. I therefore propose a new approach to this question: how does a change in the tax cost of giving affect contributions reported by the charities themselves? The following sections answer this question by exploiting a federal tax reform that changed the average tax cost of giving differentially across US states. By using this plausibly exogenous variation to isolate the causal effect of tax incentives on charitable giving, I avoid problems arising from endogenous fundraising by the organizations, the taxable income response of individuals, and any unobserved changes correlated both with successful passage of tax legislation and with charitable giving. And by looking at charities, not donors, I avoid problems with unreported and overstated contributions in the individual tax return data.

In summary, my contribution is to use a difference-in-differences strategy to identify the effect of tax price on charitable contributions, and to combine a natural experiment with charities' reported contribution receipts data to estimate the effects of tax policy.[6] As described in the following section, I will pair contribution receipts reported from the charities' Internal Revenue Service (IRS) forms 990 with a state-level measure of average first-dollar tax cost of charitable contributions. By exploiting exogenous variation across states in the average tax cost of giving created by the Tax Reform Act of 1986, I estimate the effects on charities' contribution revenues of changing donors' tax cost.

3 The 1986 Tax Reform: Background and Data Sources

The classic problem in identifying the effects of tax rates on behavior is the confounding influence of income on tax rates — after all, marginal tax rate is a nonlinear function of income and other variables. Separating income and price effects therefore becomes a challenge, and the best available strategies can require, for instance,

[6] One paper by Yetman and Yetman (2013) uses form 990 data to estimate partial correlations of direct contributions with organization characteristics and a vector of time series, including last-dollar average tax cost, over the 1991-2007 period for major nonprofit subsectors. For the most part, however, economists have made use of 990 data to examine organizations' strategic behavior, not tax policy *per se*. Okten and Weisbrod (2000) and Andreoni and Payne (2003) use 990 data to show that nonprofits do not choose their fundraising intensity at a revenue-maximizing level, implying that a revenue-maximizing objective function is a poor description of these groups' behavior. Hines (1999) argues that charities pay unrelated income business tax — that is, they report non-tax-exempt income — only when their tax-exempt funding channels are insufficient to meet their needs (i.e. taxable income is sort of an inferior good). Marx (2012) finds that charities will *reduce* their income to avoid a tax compliance notch that requires greater administrative costs tracking their finances.

comparing tax rate changes among high-income groups with low-income groups, or other not-quite-ideal approaches.

This paper will take a different approach by comparing the average marginal tax cost of a charitable contribution for a fixed set of taxpayers across states and time. The crucial change is the Tax Reform Act of 1986 (TRA86). This large and complex federal tax reform not only overhauled the federal tax code, but interacted with state income tax codes such that the combined federal and state tax cost of giving changed differently across the states in ways unlikely to have been intended by legislators at either level of government. I use variation arising as an accidental byproduct of federal tax reform as plausibly exogenous variation in the tax cost of giving, and look for a difference in the changes in charitable giving across the states.

3.1 The Tax Cost of Giving

I construct a measure of the first-dollar tax cost faced by donors from the IRS Public Use File (PUF) of individual income tax returns and from the TAXSIM calculator (Feenberg and Coutts 1993, Internal Revenue Service 2013). TAXSIM is a tax calculator maintained and hosted by the National Bureau of Economic Research which uses up to 198 different tax return variables to compute household federal tax liability for any year since 1960, or state tax liability for any of the fifty states or the District of Columbia since 1977.

Using a large, national cross-section of individual income tax returns from 1984, I set charitable contributions equal to zero and adjust all other dollar-valued variables for inflation, and calculate the combined federal and state tax liability of each return under the laws of each state and the District of Columbia, for each year. I then perform the same calculation, this time adding a small cash contribution to each return, and use the resulting change in tax liability to compute the first-dollar marginal tax cost of a cash contribution. I then take the average of the marginal tax costs, across all returns by state and year, weighted by total reported contributions, to obtain a measure of the tax cost of giving.[7] The detailed steps of this calculation and more information on the public use cross-section data are in the Appendix.

This approach creates a measure of the state-level effects of tax reform that is not influenced by states'

[7] In section 2, I noted that contributions reported on individual tax returns are reported with error. The data for 1984 are better than other years in terms of observing the giving of non-itemizers because of the presence of a modest above-the-line contribution deduction introduced by the Economic Recovery Tax Act of 1981 (and abolished by the TRA86), which allowed a limited deduction for the first $300 of charitable giving. This deduction does have limitations: 18.1 percent of non-itemizers claim the maximum allowable amount, and contributions by people not required to file, or who owed no tax against which to deduct their contributions, are still unlikely to be observed. On the other hand, the above-the-line deduction was not aggressively audited, giving both itemizing and non-itemizing taxpayers an incentive to overstate their donations and reduce their taxes in this year. (I prefer the 1984 data to the 1985 cross-section specifically because the $300 limit, which was raised in the following year, censors the dishonest as well as the generous; using 1985 data obtains very similar results, though.)

income distributions or economic trends — only by states' legal environments. This approach can be thought of as the reduced form of a common instrumental variables strategy exploiting policy variation across states. For example, Currie and Gruber (1996a,b) apply Medicaid eligibility laws by state and year to a constant, nationally representative sample of 300 children at each age from zero to fourteen to study the health effects of Medicaid reform. Health outcomes and insurance utilization are endogenous, but their state-level measure of insurance eligibility is not. Fishback and Kantor (1995) use changes in workers' compensation laws across states and time to construct a measure of the value of coverage. Feenberg (1987) uses variation across states for a fixed set of returns to identify individuals' tax cost of giving in a cross-section of 1977 returns. However, this is the first paper to use such a strategy to identify variation in the tax cost of a charitable contribution across states and years.

3.2 The 1986 Tax Reform as an Exogenous Shock

I focus on the changes implemented by the Tax Reform Act of 1986 (TRA86). The TRA86 is best known for its steep reduction in marginal rates — the top rate fell from 50 percent to 28 percent — but it also radically altered the tax base. The TRA86 was designed to be revenue-neutral within income deciles, and for each point shaved off a tax rate, somewhere else a deduction, rule, credit or policy had to be altered. It is the scope and complexity of these other changes — combined with the sudden reduction in marginal tax rates — that makes the TRA86 a credible natural experiment.

Figure 2a plots the tax cost of giving by state and year. The effect of the TRA86 on the tax cost of a cash donation is apparent; no other federal tax reform over the same period comes close to matching its magnitude. Figure 2b charts the log difference from year to year by state and demonstrates that the size of this change varied a lot *across* states. The state-level change in the log cost of a contribution from 1986 to 1988 ranged from 14 percent to 22 percent, with a median change of 18 percent. Again, the changes brought about by the TRA86 dwarf any federal or state tax change before or since. There is substantial interstate variation in the year-over-year change in the cost of giving following the TRA86, but only small, isolated changes among the states before and after; the shock of the TRA86 explains most of the change in the state-level tax cost of giving during the time period.

Not only is the change large, but the tax cost before the TRA86 does not predict the state-level change from 1986 to 1988. Figure 3 plots log state average tax cost of a contribution in 1986 against the change in average cost from 1986 to 1988. Each point is one state marked by its postal abbreviation, except for the point labeled

"NT" in the upper right region of the scatterplot, which marks the seven states with no state income tax.[8] A linear regression through this scatterplot yields only a weak relationship between change in average tax cost and the 1986 level:

$$\begin{array}{rll} \Delta_{`86-`88} \ln(TaxCost_p) = & 0.2115 & +0.0828 * \ln(TaxCost_{p,`86}) + \varepsilon_p \\ & (0.0495) & (0.1247) \end{array}$$

Where the log of the 1986 federal and state tax cost of giving in a state with policy p is denoted $TaxCost_{p,`86}$, and the change in the tax cost from 1986 to 1988 is denoted $\Delta_{`86-`88} \ln(TaxCost_p)$.Regression coefficients reported directly in the estimated equation, with standard errors in parentheses below. This weak fit is consistent with the explanation that state marginal rates do not monotonically drive the differences in average tax costs following the reform.

It may come as a surprise that the proportional change in the tax cost of contributions is not correlated with the level before 1986. The magnitude of the change is driven not by rates, but by complex interactions between state income tax laws and the changes to the federal code made by the TRA86. These interactions are a function of choices made by state legislators before the federal reform, and the resulting changes in state tax rates are an accidental byproduct of the federal reform. I will provide three examples, though these should not be taken as the only ways in which the TRA86 had differential effects across the states.

First, fourteen states allowed taxpayers to deduct their federal tax liability from their state taxable income. This means that a reduction in federal tax liability increased state taxable income and — to the extent that this increase moved taxpayers into higher-rate tax-brackets at the state level — also increased state marginal rates. In these states, the overall change in the cost of giving was dampened by the state response.[9]

Second, the states varied in the links made between their state systems and federal tax definitions. In the extreme case, four states used "piggyback" tax systems where state tax liability was a function of federal tax liability, meaning that when the federal government reduced its marginal rates, those states' marginal rates fell proportionally, amplifying the total change. Four states used the federal definition of taxable income (without a direct "piggyback" system), which meant that the reductions made by the TRA86 to credits, deductions and exemptions increased state taxable income as well, dampening the federal change. Nineteen states and the District

[8]Two states are omitted from this and other figures. West Virginia repeals its state charitable contribution in 1987, and is omitted from every analysis in this paper because of endogeneity concerns. North Dakota has incorrectly high state marginal rates in and is dropped.

[9]These states are Alabama, Arizona, Colorado, Delaware, Iowa, Kansas, Kentucky, Louisiana, Minnesota, Missouri, North Dakota, Oklahoma, Oregon, and Utah (ACIR 1986, table 54).

of Columbia used the federal definition of adjusted gross income and most federal deductions, and seven states used the federal definition of adjusted gross income only, which meant that some federal changes but not others passed through to the state level. Six states had no federal starting point in their state income tax laws.[10]

Third, states were affected to different degrees by the Alternative Minimum Tax (AMT). The AMT is a parallel tax system designed to prevent high-income households from paying "too little" tax through the legitimate use of certain deductions. Affected taxpayers have to calculate their federal tax liability under not just the normal rules, but under the AMT rules, and pay whichever is greater. By reducing the availability of itemized deductions, the TRA86 greatly reduced the number of AMT-eligible returns. In 1986, AMT taxpayers made up 1.3 percent of all federal returns, and 47.9 percent of returns reporting over $1 million dollars adjusted gross income. In 1987, these shares plunged to only 0.3 percent of all returns and just 6.6 percent of returns on over $1 million (Internal Revenue Service 1986–1987). Therefore, many high-income households who paid the AMT in 1986 saw marginal rates leap from the pre-1986 20 percent AMT rate to 28 percent or more, reducing rather than increasing their marginal tax cost of a charitable contribution. Because some state and local tax payments can be taken as itemized deductions, high-income households in states where the burden of these taxes was higher were more likely to have a greater share of AMT taxpayers, dampening the effect of the federal change.

Because its reforms spilled over into state tax incentives in a material and unexpected way, the TRA86 is a valuable opportunity to examine an exogenous shock to tax incentives. I will use data on charities' reported contribution income together with this exogenous change in tax price to estimate the effects of this incentive on charitable giving.

3.3 Associations Between Tax Cost Changes and Charitable Receipts

I compile a panel of charities' financial data from full-length IRS forms 990 collected in the Internal Revenue Service's Statistics of Income Data and cleaned and documented by the National Center for Charitable Statistics. The form 990 is a summary of income statements, balance sheets, and other data of interest many charities must file with the IRS each year. The 990 has been a public record since 1950, and the IRS Statistics of Income Division (SOI) has compiled machine-readable data files for a sample of 990s in 1982, 1983, and 1985 to the

[10]See ACIR 1986, table 52. In 1986, the "piggyback" states are Nebraska, North Dakota, Rhode Island and Vermont. The states using federal taxable income without a piggyback system are South Carolina, Idaho, Utah and Oregon. The states using federal AGI and most deductions are Maine, Delaware, Maryland, New York, Iowa, Kansas, Minnesota, Missouri, Georgia, Kentucky, Louisiana, Virginia, West Virginia, New Mexico, Oklahoma, Colorado, Montana, California, and Hawaii. The states using federal AGI only are Massachusetts, Illinois, Indiana, Michigan, Ohio, Wisconsin and Arizona. The states with no federal starting point are New Jersey, Pennsylvania, Alabama, Arkansas, Mississippi, and North Carolina. Connecticut, New Hampshire and Tennessee only tax capital income. Alaska, Florida, Nevada, South Dakota, Texas, Washington, and Wyoming have no state income tax.

present. These data files are designed to be stratified cross-sections within a year. They sample all organizations with over $10 million in assets and subsets of smaller organizations. The SOI data also try to follow the same organizations each year — making it feasible to use SOI 990 data files to construct a panel of nonprofit organizations oversampling large organizations.[11] My measure of charitable contributions is "direct public support," the sum of all contributions from taxable entities directly to the organization, which is overwhelmingly composed of individual donations.

My analysis begins by examining the relationship between reported contributions and tax cost in the raw data. Figure 4a plots the log change in tax cost from 1985 to 1988 against the 1985 to 1988 change in contributions for individual nonprofits filing in that state. A linear fit through the plot finds that a one percent increase in tax cost is associated with a 2.6 percent decrease in contributions; this slope estimate is statistically different from zero at the five percent level (state-clustered standard error = 1.27 on a coefficient of -2.6).[12]

However, the most salient feature of this plot is not the negative slope of the linear fit, but the variance of the changes in contributions. Several organizations report huge swings in contributions across years: 9.7 percent of organizations report log changes from 1985 to 1988 greater than 2 or less than -2. One Colorado organization at the bottom of the chart reports a log change in contributions of -11, receiving $6,260,000 in 1985 but just $1,210 in 1988. It seems like an astonishing plunge until one sees that this is the U.S. Olympic Foundation, which was still riding high on the 1984 summer games in Los Angeles.

Figure 4b accounts for this by averaging changes in contributions within bins by the state log tax change by hundredths (0.14 ± 0.05, 0.15 ± 0.05, …, 0.22 ± 0.05). The relationship between the tax rate change and contributions becomes more visibly negative. Our next question is whether these differences are *caused* by the tax change, or just associated with it. The following section develops a difference-in-differences strategy to isolate the causal effects of tax cost shifts.

4 Difference-in-Differences Estimates

Section 3 demonstrated that the TRA86 shifted the tax cost of charitable contributions differentially across US states, and that this interstate variation is associated with changes in organizations' donation receipts. Next, I

[11] The SOI provides cross-sectional but not sample weights, and the procedure for carrying over some organizations but not others from year to year is not documented; additionally, as described in section 6.2, organizations that ought to be observed every year are sometimes missing without explanation. For these reasons, all regressions in this paper are unweighted.

[12] If a linear fit is estimated for between this tax change and three-year contribution growth for 1982 to 1985, the slope is positive and statistically insignificant; estimates and similar scatterplots are available upon request.

will refine this analysis using a difference-in-differences strategy to determine whether the tax change *caused* the differences in charitable receipts.

Changes in tax policy may be correlated with other conditions that affect charitable giving. Therefore, it is important to examine unintended changes in tax rates to isolate a causal effect. I focus on the change in the combined tax cost of giving from 1986 to 1988 in each state. The large increase in average tax cost in all states — clearly visible in figure 2a — is a federal change that affects all organizations equally. But the state-level differences in this measure are particular to that state. Because these are caused by the complex federal tax changes unlikely to have been anticipated by state legislators, the differences in state average tax cost increases from 1986 to 1988 are a plausibly exogenous byproduct of the federal law, not an endogenous policy choice.

My treatment variable is the change in average tax cost of giving by state from 1986 to 1988. I will compare the changes in charitable receipts received by local organizations in the states with smaller tax cost increases, before and after the tax reform, with the charitable receipts received by organizations in the states with the larger tax cost increases, before and after. There are several reasons to think we should see charitable contributions change from 1985 to 1988, such as the federal tax change itself and shifts in economic growth and inflation expectations over that time. However, these national changes should effect all organizations. The gap between the change in this period for high-tax-cost-increase states and low-tax-cost-increase states — the difference in the differences — is therefore plausibly caused by the different tax shifts across states.

It is unlikely that state legislatures could have anticipated many of the changes of the TRA86, or that they would have adapted their tax policy for charitable contributions beforehand. Nor did state legislatures move swiftly to capture money left "on the table" by the federal government. Table 1 lists the states that changed their state deduction for charitable contributions or changed marginal tax rates during years 1986 to 1988. If anything, the states moved to reduce their own marginal rates as part of a broader movement of rate-reducing tax reform. Only one state, West Virginia, changes its charitable contribution deduction during this period (and is therefore dropped from the sample).[13]

The 1986 tax reform explains a huge share of variation in state-level tax cost of giving from 1977 to 2007. If I regress the average tax cost by state and year *only* on the change in tax cost after 1986:

$$\ln(TaxCost_{st}) = \alpha + \beta \left[\ln(TaxCost_{s,\text{`88}}) - \ln(TaxCost_{s,\text{`86}})\right] * Post86_t + \varepsilon_{st}$$

[13] In the TAXSIM system, there are five total changes to the deduction policies of states with income taxes in the 1982-2007 period. In addition to West Virginia's repeal of its deduction in 1987, Louisiana repeals theirs in 2003 and then restores it in 2007, and Massachusetts creates one in 2001 but repeals it in 2002.

I obtain an R^2 of 0.79. This high explanatory power is consistent with the relatively small and clustered year-over-year changes in average tax cost in other years shown in figure 2b.

In short, the TRA86 not only changed federal marginal tax rates significantly, but made many other substantial changes to the federal tax system. Because the US states could not have anticipated the specifics of this reform, and because the states varied in the extent and manner of the links between state income tax systems and the federal tax code, the TRA86 created plausibly exogenous variation in the changes in the tax cost of charitable giving across states. It is this variation I will use to identify the effect of tax incentives on charitable giving.

4.1 Sample Selection

My research design exploits variation across states in donors' average tax cost of giving. However, because I am examining donors' responses as reported by the recipient organization, I do not directly observe donors' state of residence. I therefore retain an estimation sample only of organizations which plausibly receive almost all of their donations from donors in their state of filing, using multiple filters to exclude charities which might have geographically dispersed donor bases.

I start with the full IRS public charity data, which includes 296,318 observations on 31,779 different organizations in years 1982, 1983, and 1985-2007, altogether accounting for $1,388 billion in direct contributions over the period (in 2012 dollars). I then refine the sample by taking the following steps:

1. Discard all observations except for years 1982, 1983, 1985 and 1988-1990; only keep observations on organizations observed both before and after the 1986 reform. (Remaining: 24,561 Obs, 4,673 Orgs, $157.4 billion direct contributions.)

2. Discard organizations located in West Virginia (which repeals its contribution deduction in 1987) or North Dakota (which reports incorrect marginal tax rates in TAXSIM in 1986).[14] Remaining: 24,326 Obs, 4,632 Orgs, $157.0 billion direct contributions.

3. Discard organizations meeting any of several criteria suggesting they might have donors outside their filing

[14] For 22.0 percent of sampled returns, TAXSIM computes a state marginal tax rate in North Dakota greater than 50 percent in 1986. This is true for less than 0.0007 percent of observed returns in the other 49 states and DC, and because the same calculations are not observed after the TRA86, these high rates lead to a very large calculated change in North Dakota's cost of giving from 1986 to 1988. In 1986, North Dakota taxpayers could choose between a progressive rate schedule with a top marginal rate of nine percent, or a "piggyback" payment equal to 10.5 percent of federal income tax (ACIR 1987, table 51). Because the top federal rate in 1986 was 50 percent, high earners should not have faced North Dakota marginal rates greater than 5.25 percent (0.105 * 0.50), and certainly nobody should have been subject to marginal rates over nine percent. I do not yet know the reason for these high calculated marginal rates in North Dakota.

state.

(a) Organizations that change filing state at any time across all years in the IRS Statistics of Income (SOI) or Core data files files are presumed to provide non-local goods and are dropped. Remaining: 22,927 Obs, 4,356 Org, $140.4 billion direct contributions.

(b) Organizations which ever file a "group return" on behalf of a network of affiliated organizations are presumed to have branches in other states and are dropped. Remaining: 22,834 Obs, 4,356 Orgs, $138.6 billion direct contributions.

(c) For each tax ID in the data set, I use a script to scrape and clean the organization's Form 990 mission statement from GuideStar (http://www.guidestar.org). Organizations whose names or mission statements match key words implying a non-local orientation (*e.g.* "national" or "global") are dropped. Details of this data-scraping and string-matching process are provided in the Appendix. Remaining: 20,102 Obs, 3862 Orgs, $106.6 billion direct contributions.

(d) If an organization is ever among the 25 largest organizations by assets within its major sector (as classified by the National Taxonomy of Exempt Entities), I assume that it is nationally prominent and omit it from the sample. Remaining: 19,120 Obs, 3,684 Orgs, $74.5 billion direct contributions.

4. Finally, since my dependent variable is in logs, I omit organizations that ever report zero direct contributions in the observation period. As I show in section 6.1, the overwhelming majority of charities either always receive contributions, or never do. I omit the few that vary year to year so their patterns of occasional gifts do not introduce observation error. The final sample contains 16,882 observations on 3,273 organizations, $72.1 billion direct contributions in 2012 dollars.

Section 6 uses a series of robustness checks to demonstrate that results are not driven by this sample selection procedure. Alternatives to dropping organizations reporting zero contributions are checked in section 6.1. Only examining organizations observed before and after 1986 risks being confounded by organizations' entry and exit, and I show that this does not seem to be affected by tax reform in section 6.2. The robustness of my sample selection choices to create a data set of organizations with local donor bases is checked in section 6.4. Results obtained in these sections are consistent with my preferred sample and empirical approach.

4.2 Tax Shock as a Variable Treatment

Using the data described in the preceding section, I estimate the continuous difference-in-differences regression

$$\ln(\textit{Contributions}_{it}) = \alpha_i + \beta \Delta_{86-88} \ln(\textit{TaxCost}_{s(i)}) * \textit{Post86}_t + \delta_t + \mathbf{X}'_{\mathbf{st}}\boldsymbol{\gamma} + \varepsilon_{it} \quad (1)$$

where $\textit{Contributions}_{it}$ is real direct contributions reported by organization i in year t; $\Delta_{86-88} \ln(\textit{TaxCost}_{s(i)})$ is the change in the log mean tax price of giving ($1-\tau$) from 1986 to 1988 in state s; *Post86* is equal to 0 for years 1982-3 and 1985 and equal 1 for years 1988-1990; δ_t is a year effect; and α_i is an organization fixed effect. The coefficient of interest is β, which captures the difference in contributions between states with different changes in tax price following the TRA86. Since both the dependent and treatment variables are in logs, we can directly interpret β as an elasticity of contributions with respect to the average tax cost.[15]

Alternative specifications control for differential economic trends by including region-by-year effects $\delta_{r,t}$ that capture unobservable variation across time among the four Census regions, or a row vector of state-level macroeconomic indicators $\mathbf{X}'_{\mathbf{st}}$ to capture changes in the local economic environment over time.[16] State-year macroeconomic variables include state population, real gross state product, real per capita income, unemployment rate, and poverty rate, all measured in logs.

Estimates for this regression are reported in table 2. I obtain elasticities from -3.5 to -5. Column 1 reports the basic regression, which finds an elasticity of contributions of -4.5 with respect to the average tax cost of giving. I obtain similar elasticities using region-by-year effects (-5.0), macroeconomic controls (-4.0) or both (-3.5). Standard errors are reported in parentheses and clustered by state. All estimates are statistically different from zero at the five percent level.

These estimates of the average tax cost elasticity of charitable receipts for organizations stand in striking contrast to the tax elasticities of individuals estimated in the literature. As described in section 2, individuals' tax cost elasticity has usually been estimated to be between 0 and -3. In the following sections, I will show that these large estimates are not a fluke. Next, section 5 checks for differential pretrends, a common threat to difference-in-differences strategies, and for transitory effects driven by intertemporal shifting. Section 6 checks for threats to identification from other sources, specifically the effects of specific sample selection choices, extensive margin outcomes in receiving or not receiving contributions, organization entry and exit differentials across the states,

[15] This approach assumes that the effect of a tax change is log-linear; a more general specification dividing states into "treatment" and "control" groups by whether their tax change was above or below the median is presented in the Appendix, and yields similar results.

[16] Regional patterns are also shown in figure 5, which maps tax cost changes by state.

and influential outliers. In section 7, I will argue that the difference between elasticities measured using individual and charity data is a result of looking at receipts rather than donations, which draws on data sets which differ in crucial ways. Because donors and charities are heterogeneous, these questions can have different answers.

5 Persistence and Pretrends

The causal effects of a tax cost increase on contribution receipts estimated in section 4.2 suggest that a one percent increase in average tax cost of giving reduces contribution receipts by about four percent. This result is substantially larger than the effects usually estimated using individual donor data. We may therefore fear that an unobserved phenomenon correlated with the change in state average tax cost leads the effects to be overstated.

One possible explanation is that differential pretrends drive the results. If high-tax-cost-increase states happened to have a population of nonprofit organizations experiencing slower growth in contributions than low-tax-cost-increase states before the tax reform, then the difference-in-differences estimates would return a large estimate of the effect that was actually driven by this pretrend — a common threat to identification with difference-in-differences estimation strategies.

A second concern is that the estimated effect captures intertemporal shifting of contributions, so households can take full advantage of tax incentives. Recall that estimates of the *permanent* elasticity of charitable donations from individual data are often significantly lower because households "bring forward" gifts they plan to make anyway to the year preceding a tax rate cut (Randolph 1995). In section 4.1, I tried to account for this by dropping 1986 and 1987 from the analysis; however, if households brought forward contributions to 1986 from more than one year out, it may be that the differential decline in contributions seen in 1988-1990 is really just a difference in how aggressively donors brought forward several years of planned giving.

I will test for both of these conjectured problems simultaneously by extending the data sample to later years and allowing the estimated effect of the tax change variable to vary by year. I retain the sample described in section 4.1, but also add any observations with positive direct contributions in years 1986, 1987, and 1991-2007 to the panel. I then estimate an expanded version of equation 1

$$Contributions_{it} = \alpha_i + \delta_t + \mathbf{X'_{st}}\boldsymbol{\gamma} + \sum_{t \in 1982,`83,`86,`87,\ldots,2007} \beta_t(\Delta_{86-88} TaxCost_{s(i)}) * \mathbf{1}\{year = t\} + \varepsilon_{it} \quad (2)$$

The key difference from equation 1 is the flexible specification of TRA86 treatment effects, in practice a different

effect for the tax cost change β_t in all years. The path over time described by these coefficients shows the size of the gap by treatment dosage each year, relative to the gap in comparison year 1985. Because the treatment does not actually occur until 1986, we expect β_{1982} and β_{1983} to be equal to zero. If instead we observe $\beta_{1982} > \beta_{1983} > 0$, it could suggest that the difference-in-differences estimates are describing the continuation of a preexisting trend in contributions. And if we see that the β_t's after the policy change rapidly go back to zero, despite the permanent change in tax cost of giving shown in figure 2a, that would be consistent with the estimates describing a short-term shifting of intended contributions, rather than a permanent effect of the policy change on contributions.

Figure 6 charts the point estimates of β_t by year, with dashed lines marking pointwise 95 percent confidence intervals for test of $\beta_t = 0$ (that is, statistically indistinguishable from 1985).[17] The implications of these estimates for the two concerns raised above are clear. First, the estimates for 1982 and 1983 are statistically indistinguishable from zero and are, if anything, increasing over 1982-5. There is no evidence of a 1982-5 pretrend actually driving the difference-in-differences estimates. Second, the effect of the tax cost change is not only persistent, but if anything the gap between high-increase and low-increase states expands over the following 10-15 years. This is consistent with an effect that is not driven by tax-shifting but a permanent fall in the contributions to these organizations. Specifically, it suggests that donors respond with a lag — the instantaneous shift is less than the long-run effect of the policy.

Overall, these results confirm the validity of the difference-in-differences strategy. Two main threats to my estimates, differential pretrends and intertemporal shifting, are not indicated by the long-run effects or year-specific coefficients estimated. The results also describe an effect that is durable and persists for years.

6 Robustness

This section will investigate other possible explanations of the large estimated effects, including robustness to the sample selection decisions described in section 4.1, the possibility that organizations enter and exit differentially across states, and that the estimates are driven by outliers. None of these checks prompt a reinterpretation of the estimates obtained in prior sections; throughout, I find a robust, negative relationship between average tax cost of giving and charitable receipts.

[17] I also tabulate the coefficients in an appendix table.

6.1 Extensive Margin of Contributions

My sample selection process discards organizations with zero direct contributions in any of the years of interest. For the full 1982-2007 sample over 78 percent of organizations either *always* receive direct contributions, or *never* do. It appears there is a fundamental difference between organizations that do and do not finance their operations with contribution revenues. However, focusing on organizations that always receive contributions limits our ability to observe important behavior at the extensive margin, reflecting an endogenous decision to start or stop soliciting donations; perhaps changes in contribution receipts would look different if we accounted for organizations deciding endogenously to fire their fundraising staff after the TRA86.

A descriptive multivariate regression allows me to test this claim. Let $ReceivedCont_{it}$ be a binary variable equal to 0 if organization i received zero direct contributions in year t, and equal to 1 if it received strictly positive contributions. I estimate the linear probability model

$$ReceivedCont_{it} = \alpha_i + \mathbf{X_{it}'}\boldsymbol{\gamma} + \beta \ln(TaxCost_{s(i),t}) + \varepsilon_{it} \tag{3}$$

for the entire Statistics of Income sample (to year 2007), where $\mathbf{X_{it}'}$ is a set of firm financial variables and $TaxCost_{it}$ is the log average tax cost of a contribution. The estimates are reported in table 3, column 1. Although revenue from other sources is correlated with contribution revenue, the partial correlation on *TaxCost* is close to zero and not statistically significant.

To confirm that the problem is not at the margin of my sample, I repeat this analysis using data from years 1982, 1983, 1985 and 1988-90 for organizations which meet all other criteria to be included in the main sample, and instead of tax cost I use the continuous treatment variable, $\Delta_{86-88} \ln(TaxCost_{s(i)}) * Post86_t$. These estimates are reported in table 3, column 2, and again show no statistically significant relationship between the tax cost measure and the probability of strictly positive contributions.[18]

As an additional check, table 4 reports regressions identical to those in table 2, column 2, except uses as dependent variable the log of direct contributions plus a constant (since log of zero is undefined). My preferred additive constant is \$25,000, which is the minimum income requiring an organization to file a form 990, though columns 1 and 3 report results for an addition of \$10,000 and \$50,000 as well.[19] Column 4 of the table repeats

[18] Use of a logit instead of a linear probability model does not change either set of results.

[19] In the literature on individual contributions, it is common to include zeroes in the logged dependent variable by adding \$10. This is appropriate because the individual tax return data includes a large number of small, positive contributions: for example, in 1985, 11.9 percent of individual returns deducted a gift between \$1 and \$100. In contrast, very few charities in the sample ever report contribution receipts below \$10,000, and a change in logs from \$10 to \$525, the first percentile of positive observations in 1985, is greater than the

the regression with the added $25,000, but only for the same sample as in table 2. Adding the additional data and changing the dependent variable reduces the magnitude of the estimates somewhat, but qualitatively the result — a large, negative relationship between average tax cost and contribution revenue — is unchanged.

In summary, it is uncommon for charities to accept contributions in some years but not in others. Upon further examination, neither the extensive margin of receiving or not receiving contributions, nor the use of observations reporting zero contributions (by adding a constant before taking a log) suggest a different interpretation of the results in section 4.2.

6.2 Entry and Exit

Since the sample defined in section 4.1 only uses organizations observed before and after the tax change, another concern is that the effect of the tax cost is partly observed in the form of different rates of organization entry and exit.

There is no data source which observes charities' entry and exit directly. Though the IRS maintains a master file of registered nonprofit organizations, it is rarely updated and inappropriate for this type of quantitative analysis.[20] Nor are the Statistics of Income data appropriate for studying entry and exit, as firms are not observed every year: although charities with at least $10 million in gross assets ought to be observed one hundred percent of the time, major organizations are frequently missing for a year or two. For example, the University of Chicago is missing in year 1997; in 1996 Chicago's total assets were reported to be $3.1 billion, well above the threshold for mandatory sampling.

Those data limitations mean that I cannot answer the question definitively. As an alternative, I demonstrate what the available information hints about entry and exit of organizations by state. The form 990 includes a field for the date of the organization's letter from the IRS recognizing it as a tax-exempt public charity. The date of this letter marks the start of the IRS's recognition of the organization as a charity and defines a minimum age for the organization (which has to be at least as old as its exemption letter date). Therefore, if a state's population of charities tends to have more recent exemption letters on average than other states, that suggests that the turnover rate in the state must be higher (either organizations are being created more quickly than in other states, or old organizations exit more rapidly, or both).

I plot state-level shares of forms 990 filed by organizations with post-1986 exemption letters as of 1989

log increase from the median ($467,109) to the 95th percentile ($1,110,000). A larger additive constant than 10 is therefore necessary to use observed zeroes in approximate logs without underweighting the variance among positive observations.

[20] See (National Center for Charitable Statistics 2013, pp. 4–5)

against post-1986 tax rate (figure 7a) and 1986–1988 change in tax rate (figure 7b). I derive shares of organizations with recent exemption letters from the 1989 IRS Core Files, a dataset containing a limited set of form 990 variables for the universe of filing organizations (Internal Revenue Service 2011). Neither tax variable is highly correlated with state shares of recently exempted organizations. Post-1986 tax rate and recent exemption share have state-level correlation 0.061 (p-value = 0.6799), and tax cost change and recent exemption letter share have correlation 0.100 (p-value=0.508).

As an added check, I test whether the change in average tax cost is correlated with exit using prospective data. Let $LastOb_i$ be the last year up to 2007 in which organization i is observed in the Statistics of Income or Core Files data sets; though failure to observe an organization does not mean it has disappeared, a recorded 990 almost certainly means it still exists. Therefore the last year of observation should be highly (negatively) correlated with date of exit. For organizations observed in the 1986 Statistics of Income data, I regress

$$LastOb_i = \alpha + \mathbf{X_i'}\boldsymbol{\gamma} + \beta \ln(TaxCost_{s(i),\text{'86}}) + \delta \Delta_{86-88} TaxCost_{s(i)} + \varepsilon_i \tag{4}$$

where $\mathbf{X_i'}$ is a vector of organization i's financial variables, and the tax variables capture both the rate before the 1986 tax reform and the TRA86 state level tax change. The results of this regression are presented in table 5. Though income and assets are associated with a later end date, there is no significant association between last observation year and tax rates.[21] In summary, there does not seem to be a strong association between the TRA86 tax change and organization entry and exit.

6.3 State Law Exogeneity

Table 1 reports changes to state income tax rates over 1986–1988 reported by ACIR. As described in section 4.1, I drop West Virginia because of changes made to their state charitable contribution deduction during this period, and North Dakota because of implausibly high marginal tax rates. However, my main analysis does retain the tabulated states which changed their marginal tax rates during this period. As table 1 demonstrates, there does not seem to be a rush to raise marginal rates at the state level and undo the rate cuts at the federal level, nor is it likely that states would have changed their laws specifically to maintain a constant incentive to give to charitable organizations. Still, we may be concerned that the regression results are driven by states that change their own

[21] The channel through which income and asset variables are related to last observation year is ambiguous; organizations with more money are presumably less likely to exit for financial reasons, but are also more likely to be required to meet Form 990 filing requirements each year. It is likely that both causes are important.

tax laws, and that the effect of an exogenous tax change on charitable receipts is therefore not well-identified.

Therefore, table 6 replicates the difference-in-differences estimates of equation 1, but drops the sixteen states which changed their marginal rates over this period. The reported estimates indicate that, if anything, inclusion of those states attenuated the estimated elasticities toward zero; in the reduced sample, the estimates range from -4.7 to -6.2. State rate changes do not seem to be driving the results.

6.4 Sample Selection Checks

Section 4.1 described a series of steps taken to limit the sample to organizations for whom the average tax change in the state of filing plausibly describes average tax change for their pool of possible donors. My estimation strategy requires that a charity's donors be located in the state of the charity's 990 filing, or the attribution of all changes in donation behavior to particular state policies will tend to attenuate estimates toward zero. (For example, though the American Red Cross is headquartered in Washington, the tax law of the District of Columbia affects only a small share of its donors.) This section demonstrates that the result is robust to the choices made in that sample selection process.

First, I consider whether the sample is too narrow by estimating the difference-in-differences regression described in equation 1 without any limitation of organizations by likely "local-ness." Instead, I skip step 3 of the process outlined in section 4.1. I report the results of using this expanded sample in table 7. The obtained difference-in-differences estimates are not wildly altered, ranging from -2.8 to -3.8 and remaining statistically significant. The lower magnitudes are consistent with attenuation bias in the measure of average tax cost.

Second, I check whether use of an unbalanced panel distorts the obtained results. Because the Statistics of Income data only try to sample the largest organizations by assets every year, an unbalanced panel allows use of information about more and smaller organizations than otherwise; however, if the pattern of observation is correlated with the outcome of interest, then estimates from an unbalanced panel may be biased. Table 8 reports continuous difference-in-differences estimates using only organizations observed in all six years. The results are consistent with table 2, obtaining elasticities from -3.2 to -4.3; none are statistically different from the corresponding estimate in table 2. There seems to be no indication that an unbalanced panel is driving the results.

Third, we may be concerned that the filters used to eliminate organizations with broad donor bases are not *strict enough*. If the remaining interstate contributions are randomly distributed, this will tend to attenuate estimates toward zero. But if flows of donations across states are nonrandom, the estimates might be distorted

by these cross-border effects. I check for this in two ways. First, I check that the results are not driven by patterns of donation flows within interstate communities by repeating the analysis of table 2, but dropping organizations located in Census Metropolitan Statistical Areas that straddle state borders. For example, the Washington, DC metropolitan statistical area spreads over Maryland, Virginia, West Virginia, and the District of Columbia, each with their own state tax laws, and is therefore dropped. The estimates obtained with this restricted sample, reported in table 9, are not qualitatively or statistically different from those presented in table 2. Second, I do a placebo test for the possibility that national changes in giving patterns uncorrelated with donors' tax rates drive the results, by repeating the analysis in table 2 for charities that meet other sample selection rules, but are flagged as nationally prominent by sample selection step 3 in section 4.1. Table 10 reports these results; the coefficients on the tax treatment variable are positive, consistent with the explanation that it is tax changes, and not some other unobserved change, that drives the results.

Overall, these results suggest that my preferred sampling procedure is not creating a spurious association between tax changes and charitable contributions.

6.5 Outliers

Figure 4a not only plots a statistically significant linear relationship between state average tax cost change and log change in individual organizations' contribution revenue, but also makes clear that organizations can experience truly huge swings in their contribution revenue from year to year. One may be concerned that the difference-in-differences results may not be estimating an actual tax effect, but rather just the influence of a few outliers that experience huge changes in their contributions following the tax change, and that just happen to be located in high- or low-tax-change states.

Table 11 checks for this by omitting organizations with the largest and smallest volatility of log contribution revenue, measured by individual standard deviations over the observation period. Column 1 omits the most and least volatile one percent of organizations (two percent of organizations, total); column 2 omits the most and least volatile five percent.

The results are qualitatively consistent with table 2. Though the obtained point estimates are lower in magnitude, they describe a large negative association between tax cost change and contributions received (coefficients of -2.81 and -2.65), and both are statistically different from zero at the ten percent level. At the same time, both estimates are statistically different from the corresponding estimates in table 2 at the ten percent level as well (p-values of 0.0130 and 0.0521, respectively), suggesting that outliers may be important to the magnitudes

obtained in table 2.

7 Comparing Donors' and Charities' Tax Elasticities

The preceding sections have demonstrated that organizations with a large increase in tax cost of giving received lower contributions after the TRA86 than organizations in states where the tax cost increased less sharply. Interpreted as an elasticity, contributions fall by about four percent for a one percent increase in tax cost. This stands in striking contrast to the literature on individual donations, which finds a decline of about 1.2 percent in individual donations for a 1 percent increase in individual tax cost of giving.

The discrepancy between these two estimates is striking, but readily explained by differences in the two data sources and in the methods used to analyze them. First, both data sets are constructed from subsets of all donations in ways that are likely to make them unrepresentative of the whole, and different from each other. Analysis of household tax return data excludes a group of people likely to be more tax-sensitive than the population as a whole — non-itemizers — while the form 990 data excludes one of the least tax-sensitive sectors — churches and houses of worship. In addition to these compositional differences, the composition of observed values differs across the two samples: donors give the most dollars to churches (a low tax-sensitivity sector), while observed charities receive their largest contributions from the very wealthy (the most tax-sensitive group).

The sample examined in this paper is not representative of the charitable sector as a whole in two important ways. First, many charitable organizations do not file the form 990, including private foundations (which file the 990-PF), government entities (such as public universities), very small organizations, and churches. In 1985, the charities required to file the form 990 accounted for 41.5 percent of all public charities by contributions; giving to churches and other houses of worship made up over half of charitable giving. Second, the identification strategy used in section 4 requires a focus on local charities, whose donors may not respond to tax incentives in the same manner as donors to national charities. The charities observed in the Statistics of Income data represent 24.6 percent of all charitable giving in 1985; the observations retained following the data-cleaning procedure described in section 4.1 represent 10.7 percent of all charitable contributions.

Analysis of survey data has suggested that giving to churches is less tax-sensitive than other charitable giving (Giving USA 2013; Feldstein 1975). This is consistent with the volatility of aggregates: figure 8 plots year-over-year changes in charitable giving. Religious giving is the least volatile of any of the charitable sectors; over the

1982-1990 period, real annual change in aggregate religious giving had a coefficient of variation of 1.04, compared to a coefficient of 2.25 for total charitable contributions.[22] Because the form 990 data does not include churches, we therefore would expect estimates of tax-sensitivity to be of larger magnitude than if churches were included.

While churches are not observed in form 990 data, we can test for differences among the charities that are required to file the form. The NCCS 990 data report National Taxonomy of Exempt Entities (NTEE) sector codes for each organization. Table 13 reports the number of organizations and observations in the sample by each NTEE code. Retained organizations are not evenly distributed among the sector codes: health charities, mostly community nonprofit hospitals, comprise a plurality of observations, followed by education and human services, then by arts and culture charities and by grantmaking charities (such as United Ways and community foundations). No other NTEE sectors have more than 100 organizations observed in the sample.

To test for heterogeneity by charitable sector, I modify equation 1. For each nonprofit sector S of interest, I estimate

$$\ln(\textit{Contributions}_{it}) = \alpha_i + \beta\Delta_{86-88}\ln(\textit{TaxCost}_{s(i)}) * \textit{Post86}_t + \delta_t + \mathbf{X}'_{\mathbf{st}}\boldsymbol{\gamma} + \varepsilon_{it}$$
$$+\zeta\textit{Post86}_t * \mathbf{1}[\textit{Sector}_i = S] + \eta\Delta_{86-88}\ln(\textit{TaxCost}_{s(i)}) * \textit{Post86}_t * \mathbf{1}[\textit{Sector}_i = S] \quad (5)$$

where $\mathbf{1}[\textit{Sector}_i = S]$ is an indicator equal to 1 if organization i is in sector of interest S. Additional coefficients ζ and η allow for a different effect on organizations S than the rest of the sample. I report these coefficients, as well as β and p-values for the joint significance of the sector-S estimates, for the five most common sectors in table 14. The obtained results are consistent with different tax responses by charitable sector: the health and philanthropy sectors are significantly more tax-responsive than the rest of the sample, while the culture and education sectors are less tax-responsive. The human services sector is not statistically different from the rest of the sample. The magnitude of the obtained estimates is particularly striking for the Health sector, which not only has a large and highly significant coefficient (-7), but which appears to drive much of the results — the coefficient for the rest of the sample is much smaller (-0.7) and not statistically different from zero when health charities are allowed to be affected differently.

Tax responses vary by donor as well as by charity. Cross-sectional studies of upper-income households have found that donors' tax-sensitivity is "U-shaped" in income (Feldstein and Taylor 1976, Clotfelter 1985).[23] Be-

[22] Over this period, religious giving grew by a mean of 3.7 percent a year with a standard deviation of 3.9 percentage points; total giving grew by an average of 2.6 percent each year with a standard deviation of 5.8 percentage points.

[23] I replicate this finding for 1982-1990 individual return data in the Appendix.

cause non-itemizers, who tend to have lower incomes than itemizers, have no incentive to report their charitable giving in most years, they are generally excluded from analysis of giving in tax return data. However, from 1983 to 1986, non-itemizers were able to take a limited deduction for their charitable contributions, a provision repealed by the TRA86. Since non-itemizers saw their tax cost of contributions increase after 1986, omitting them from analysis of household data may mean focusing on a less tax-sensitive sample than the population as a whole.

In addition to differences in data composition, because donors' behavior is heterogeneous, computing the elasticity of received donations asks a fundamentally different question than the elasticity of donors' contributions. As section 3.3 documents, voluntary contributions to charities can vary greatly from year to year; one important component of this variation is large one-time gifts. A charity might have many small-dollar donors that give regularly and are not particularly tax-sensitive, yet its overall contributions could be profoundly affected by tax rates.

I do a rudimentary test for the possibility that high-income households are driving the tax response by splitting the average tax cost measure into two pieces. Let $\Delta_{86-88} \ln(TaxCost_{s(i),q})$ denote the change in the average tax cost of giving from 1986 to 1988 for returns with adjusted gross income in fractile q of the distribution. (That is, follow the same procedure outlined in section 3.1, but assign zero aggregation weight to returns not in fractile q of the income distribution.) I split the average tax cost instrument into the portion explained by fractile q, and residual variation:

$$\begin{aligned} \Delta_{86-88} \ln(TaxCost_{s(i)}) =& \alpha_0 + \alpha_1 \Delta_{86-88} \ln(TaxCost_{s(i),q}) + u_{qs} \\ Residual_{qs} \equiv& \hat{u}_{qs} \end{aligned} \tag{6}$$

This divided variable is plugged into equation 1 to see whether the variation across states is better explained by fractile q or by the unexplained component of $\Delta_{86-88} \ln(TaxCost_{s(i)})$

$$\begin{aligned} \ln(Contributions_{it}) = \alpha_i + \delta_{r,t} + \mathbf{X'_{st}}\boldsymbol{\gamma} + \beta_1^q Residual_{qs} * Post86_t \\ + \beta_2^q \left(\Delta_{86-88} \ln(TaxCost_{s(i),q}\right) * Post86_t + \varepsilon_{qit} \end{aligned}$$

If β_2^q explains most of the variation regardless of income tier, that would be consistent with the interpretation that the change in tax policy common to all levels of the income distribution are most important for explaining

changes in charitable receipts. On the other hand, if only the top tiers of the income distribution are associated with differences in contributions across states, that would be consistent with the interpretation that it is the effects of the tax cut on high-income households drives the observed changes.

The estimates for coefficients on the income tier averages and residual pieces are presented in table 15. The results are consistent with the interpretation that the tax cut common to all households is not the driving force behind changes in contribution behavior: the residual, and not the income fractile component, is most strongly associated with the tax change for the first 8 deciles of the income distribution. On the other hand, for the top two deciles, the component explained by the income decile is highly statistically significant and negative while the residual piece is statistically indistinguishable from zero. Furthermore, because the size of the tax change for these deciles is larger, the estimates — negative 2.8 for the top tenth of the income distribution — are somewhat smaller than the corresponding estimate (-3.5) in table 2; this suggests that estimates in table 2 may be overstated because of scaling. That is, because upper-income households experienced larger tax cuts than the rest of the population on average, if they are the ones driving the results, then the tax change for the population as a whole will be too small in magnitude, overstating estimates.

There are good reasons to expect that public charity data would yield a different tax cost of giving elasticity than household tax returns. The two data sources are composed of particular kinds of charity and particular kinds of household that are not representative of all charities or all household: household tax return data does not observe non-itemizers' giving, while my regression sample omits national charities and churches. Moreover, because total household donations and total charitable receipts are aggregations of the contributions from particular donors to particular charities, we expect the measured responses to differ to the extent that the two variables aggregate the underlying heterogeneous responses in different ways.

8 Interpreting Trends in Aggregate Charitable Giving

The preceding sections have shown that tax policy can matter for charitable giving, at least for local, non-church charity, especially health charities. Recall, however, that the share of national income going to going to charitable contributions hardly changed following the TRA86, and is consistently about two percent of GDP over the postwar period even as tax rates changed substantially over this period. Far from witnessing a plunge in charitable contributions, charitable giving rose 10.1 percent in real terms from 1985 to 1988. A similar modest increase happened for sampled organizations as well: aggregate gifts to organizations in the regression sample in both

1985 and 1988 rose 4.7 percent over that period in real terms. If we believe that the tax cost elasticity of charitable contributions for these charities is really about -3 to -5, then we must also believe that had the TRA86 not reduced tax rates, charitable giving to these groups over this period would have risen sharply.

Such a surge is plausible. The contributions-to-GDP ratio in the postwar period masks two countervailing trends: the steady decline in marginal tax rates (which has decreased charitable donations by raising the tax cost of giving) and rising income of high-income households (which, because philanthropy is a luxury good, has increased charitable giving). The causes and implications of income inequality are a fiercely debated topic, and beyond the scope of this section. Instead, I will briefly provide two pieces of evidence that the constancy of the contributions-to-GDP ratio does not tell the entire story.

First, the TRA86 coincided with a rapid increase in real incomes at the top of the income distribution. Figure 9 charts the share of national wage and salary income redounding to households at the top of the income distribution from 1927 to the present. After a long decline, the top one percent of households saw their income share increase gradually beginning in the 1970s, with a particularly sharp increase over 1986 to 1988.[24] Yet this rapid increase in income did not translate into a surge in charitable contributions: figure 10 charts the share of pre-tax non-capital gains income contributed by households top income tiers. Vertical lines denote federal tax reforms; giving noticeably spikes in 1981 and 1986, preceding tax cuts, before falling to new rates; it then rises again following the tax hikes in 1990 and 1993.

This income surge explains why my difference-in-differences estimates can imply a large sensitivity of charitable receipts following the TRA86 without an accompanying plunge in aggregate giving: had income spiked as it did without a simultaneous tax cut, then charitable contributions would have surged in this period. Table 16 reports giving per household among high-income tiers of itemizing households in 1985 and 1988. Had itemizing households with more than $100,000 in real (2012) income contributed the same share of income in 1988 as they had in 1985, real personal charitable contributions would have risen by 30 percent over that period instead of 10 percent. Since this back-of-the-envelope estimate does not analyze possible changes in the giving behavior

[24]The rapid increase in observed personal income after 1986 was not necessarily only an independent of changes in federal tax law. Slemrod (1996) and Gordon and Slemrod (2000) observe that 1988 to 1990 was a brief period when the top tax rate on personal income was lower than the corporate income tax rate, and argue that much of the increase in personal income was really business owners moving the tax base from C-corporations to S-corporations, partnerships, and other forms of personal income. But if the falling share of personal income contributed to charities were explained by shifting of taxable income out of C-corporations, then we should expect corporate charitable contributions to rise following the TRA86 (shifting the tax benefit of charitable contributions from the individuals to corporations). Instead, corporate charitable contributions experienced a year-over-year decline every year from 1987 to 1991, both in absolute terms and as a share of corporate profits (Giving USA, §18). Furthermore, the inversion of personal and corporate tax rates ended with the 1990 tax increase, but the rising share of income redounding to the top of the distribution continued unabated (figure 9). It is therefore likely that long-run changes at the top of the income distribution are driven by real changes in the economy, and not solely by tax base shifting.

of non-itemizers or lower-income itemizers, who also saw their incentives to contribute reduced after 1986, this is a conservative estimate of the counterfactual increase in charitable contributions. Had the post-1986 surge in incomes happened without a tax cut, and without an accompanying decline in share of income donated, then a counterfactual surge in charitable contributions looks plausible.

Additionally, comparison of eras with similar income inequality, but differing marginal tax rates, tells a different story. Charitable giving in the interwar period — when marginal tax rates were below twenty percent for almost everybody, and the income share at the top of the distribution comparable to the late 1980's — was significantly lower than two percent of GDP. Figure 1 plots four different measures of the charitable contributions-to-GDP ratio for this earlier period from Andrews (1950) and Jones (1954), as well as itemized contributions from tax returns. Estimates of total interwar giving are consistent with a rate of contributions well below the lowest share of GDP observed in the postwar era — but rising rapidly in the 1940s as tax rates rose broadly for another war.[25]

With the benefit of longer historical perspective, there is no reason to believe charitable contributions are permanently anchored to two percent of GDP. Rather, the stability of charitable giving over the postwar period is consistent with a general decline in tax incentives for charitable giving happening concurrently with an increase in the top households' share of income. If the charitable contribution for upper-income households were to be curtailed by a future tax reform, it is entirely possible that charitable giving would fall.

9 Concluding Remarks

In conclusion, the evidence suggests that reducing upper-income households' charitable contribution tax incentive is not a "free lunch." Charitable contribution receipts are sensitive to the tax subsidy for individual income taxes; this sensitivity is driven by the very high-income households that tax reformers have recently proposed targeting. The size of the effect is remarkable in light of the consensus from the related literature on individual donors that finds a less sensitive elasticity of charitable contributions. However, the discrepancy is explicable because I am studying a different effect — the response of donations, not donors — and those who give the most tend to be the most tax-sensitive. My estimates imply that the tax cost of a charitable donation matters a

[25]Though marginal rates did rise under the New Deal, before the Second World War they did so more as a populist gesture than a serious tax reform; the Revenue Act of 1935 set a 75 percent top marginal rate on incomes over $5 million dollars, a tax bracket believed to have applied solely to John D. Rockefeller. In contrast, filers at the 99th percentile of income from 1932 to 1939 (ranging from about $74,000 to $138,000 in 2012 dollars) faced marginal rates of 10 to 15 percent. Marginal rates at the 99th percentile of income ranged from 39 to 62 percent, however, during the war (Piketty and Saez 2003, Tax Foundation 2013).

great deal, at least for some donors and some charities.

That these charities appear to be more tax-sensitive than household donations overall limits the external validity of these findings to the charitable sector as a whole, but it also implies that a focus on the average donor response ignores heterogeneous effects of changes to charitable tax incentives across donors and across charities. Upper-income households' contributions to particular charitable sectors are quite tax-sensitive. Proposed tax reforms that undermine these incentives could have large effects on provision of these services. As policymakers consider tax reforms, they should consider both the higher responsiveness to these incentives of upper-income households, and whether the charities most likely to be harmed by a change in tax incentives — rather than contributions in the aggregate — are worth the costs of the foregone tax revenue. Instead of raising revenue by limiting the existing deduction, legislators might prefer to consider narrowing eligibility for the deduction to sectors where the incentive has the largest effect.

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Tables

Table 1: Major State Individual Income Tax Changes Legislated 1986–1988

	1986	1987	1988
Eliminated Deduction for Contributions		WV*	
Reduced Marginal Tax Rates	DE, MI, PA, VT	CA, IA, NY, WI	OK, UT, VT
Increased Marginal Tax Rates	NM, UT	ID, IN, MT, ND*	AZ

Sources: ACIR 1987–89, table 49; Feenberg and Coutts (1993). (*) W. Virginia is dropped from all regressions because of this policy change. North Dakota has a state credit in the TAXSIM system until 1987 and is dropped.

Table 2: Continuous Difference-in-Differences

	(1)	(2)	(3)	(4)
	Log Direct Contributions			
$\Delta_{86-88} TaxCost_{s(i)} * Post86_t$	-4.450**	-5.016***	-3.990***	-3.503***
	(1.723)	(1.420)	(1.185)	(1.140)
Org. Effects	✓	✓	✓	✓
Year Effects	✓		✓	
Year*Region Effects		✓		✓
Macro Controls			✓	✓
Observations	16882	16882	16882	16882
R-squared	0.861	0.862	0.862	0.862
Number of Orgs	3273	3273	3273	3273

Dependent variable is log of real direct public support from a panel of IRS form 990 data for 1982–3, 1985, and 1988–90. $\Delta_{86-88} TaxCost$ is the change from 1986 to 1988 in the first-dollar marginal tax cost of a charitable contribution in state s, averaged over a fixed set of individual income tax returns. *Post86* is equal to 1 after 1986 and zero before. "Macro Controls" are a set of macroeconomic variables observed in each state and year: log gross state product, log state population, log unemployment rate, log poverty rate, and log per capita income. See the discussion in section 4.2 for more detail. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

Table 3: Extensive Margin (Probability of Positive Contributions)

	Pr(Receiving Contributions)	
	(1)	(2)
	All Observations	Main Sample
Log Assets	0.00150	0.00238
	(0.00131)	(0.00637)
Log Gov. Grants	0.00506***	0.00752**
	(0.00133)	(0.00341)
Log Program	0.00617***	0.00164
Service Revenue	(0.00148)	(0.00365)
$TaxCost_{st}$	-0.0745	
	(0.0888)	
$\Delta_{86-88} TaxCost_{s(i)}$		0.366
$*Post86_t$		(0.349)
Org. & Year Effects	✓	✓
Observations	296161	21314
R-squared	0.729	0.512
Number of Orgs.	31772	4125

Dependent variable is equal to 1 if a charity receives at least one dollar in direct support in year t, zero otherwise. *TaxCost* is the marginal first-dollar tax cost of a charitable contribution, averaged over a fixed set of individual tax returns, in state s and year t. Log of assets is observed at the beginning of the year. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

Table 4: Continuous Difference-in-Differences (With Reported Zeroes)

	(1)	(2)	(3)	(3)
	Log Real Contributions +$10,000	Log Real Contributions +$25,000	Log Real Contributions +$50,000	Log Cont +$25,000 Main Sample
$\Delta_{86-88} TaxCost_{s(i)}$	-3.160*	-3.052**	-2.870**	-3.794***
$*Post86_t$	(1.664)	(1.431)	(1.262)	(1.385)
Org. Effects	✓	✓	✓	✓
Year Effects	✓	✓	✓	✓
Observations	21318	21318	21318	16882
R-squared	0.835	0.851	0.862	0.890
Number of Orgs	4125	4125	4125	3273

Dependent variable is log of real charitable contributions plus a constant, in 2012 dollars. Independent variables are described in notes to table 2. The sample includes organizations reporting zero direct support in some years. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

Table 5: Last Year Observed Regressed on Financial and Tax Variables

	(1)	(2)
Data Year	1986	1989
Log Assets	0.245***	0.331***
	(0.0453)	(0.00846)
Log Total Income	-0.139**	0.0159
	(0.0610)	(0.0191)
Log Contributions +Grants	0.155***	0.108***
	(0.0154)	(0.00670)
Log Program Service Revenue	0.0228	0.0536***
	(0.0144)	(0.00835)
Log Tax Price	-1.469	-0.912
	(2.390)	(2.177)
$\Delta_{86-88} TaxCost_{s(i)}$	-1.177	-0.202
	(2.198)	(0.801)
Constant	2000***	1998***
	(0.713)	(0.497)
Observations	6644	135808
R-squared	0.043	0.055

Dependent variable is the last year for which the organization is observed in the Statistics of Income or IRS Core Data files of form 990 filings, up to year 2007 — so column 1 regresses the last year in which organizations present in the 1986 data are observed, while column 2 regresses last year observed for organizations present in the much larger 1989 Core data set. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

Table 6: Continuous Difference-in-Differences (Excluding Rate-Changing States)

	(1)	(2)	(3)	(4)
	Log Direct Contributions			
$\Delta_{86-88} TaxCost_{s(i)}$	-6.164***	-6.263***	-4.731***	-3.977***
$*Post86_t$	(1.633)	(1.592)	(1.342)	(1.371)
Org. Effects	✓	✓	✓	✓
Year Effects	✓		✓	
Year*Region Effects		✓		✓
Macro Controls			✓	✓
Observations	10422	10422	10422	10422
R-squared	0.860	0.860	0.860	0.861
Number of Orgs	2024	2024	2024	2024
Difference test (p-value)	0.018	0.0019	0.1847	0.0235

See notes to table 2 for description of variables. Sample excludes states in table 1 observing a rate change in years 1986–8. "Difference test" reports a p-value for difference between this subsample and the main sample used in table 2. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

Table 7: Continuous Difference-in-Differences (Nonlocal Organizations Included)

	(1)	(2)	(3)	(4)
	Log Direct Contributions			
$\Delta_{86-88} TaxCost_{s(i)}$	-3.153**	-3.729***	-2.760***	-3.048***
$*Post86_t$	(1.562)	(1.273)	(1.022)	(0.996)
Org. Effects	✓	✓	✓	✓
Year Effects	✓		✓	
Year*Region Effects		✓		✓
Macro Controls			✓	✓
Observations	21653	21653	21653	21653
R-squared	0.880	0.880	0.880	0.880
Number of Orgs	4146	4146	4146	4146
Difference test (p-value)	0.0007***	0.0000***	0.0004***	0.0003***

See notes to table 2 for description of variables. Sample does not exclude non-local organizations. "Difference test" reports a p-value for difference between this larger sample and the nested sample used in table 2. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

Table 8: Continuous Difference-in Differences (Balanced Panel)

	(1)	(2)	(3)	(4)
	Log Direct Contributions			
$\Delta_{86-88} TaxCost_{s(i)}$	-3.686*	-4.716**	-3.673**	-2.962**
$*Post86_t$	(2.074)	(1.778)	(1.507)	(1.453)
Org. Effects	✓	✓	✓	✓
Year Effects	✓		✓	
Year*Region Effects		✓		✓
Macro Controls			✓	✓
Observations	10449	10449	10449	10449
R-squared	0.854	0.855	0.855	0.855
Number of Orgs	1765	1765	1765	1765
Difference test (p-value)	0.3672	0.8352	0.8606	0.6277

See notes to table 2 for description of variables. Sample is restricted to organizations observed in 1982, 1983, 1985, 1988–1990. "Difference test" reports a p-value for difference between this subsample and the main sample used in table 2. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

Table 9: Continuous Difference-in-Differences (Excluding Interstate Metropolitan Areas)

	(1)	(2)	(3)	(4)
	Log Direct Contributions			
$\Delta_{86-88} TaxCost_{s(i)}$	-4.415**	-4.922***	-4.058***	-3.776***
$*Post86_t$	(1.757)	(1.312)	(1.201)	(1.144)
Org. Effects	✓	✓	✓	✓
Year Effects	✓		✓	
Year*Region Effects		✓		✓
Macro Controls			✓	✓
Observations	14297	14297	14297	14297
R-squared	0.863	0.864	0.864	0.864
Number of Orgs	2812	2812	2812	2812
Difference test (p-value)	0.663	0.7835	0.8134	0.8517

See notes to table 2 for description of variables. Data excludes charities sited in Census Metropolitan Statistical Areas that encompass portions of more than one US state. "Difference test" reports a p-value for difference between this subsample and the main sample used in table 2. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

Table 10: Continuous Difference-in-Differences (Placebo Test, National Organizations)

	(1)	(2)	(3)	(4)
	Log Direct Contributions			
$\Delta_{86-88} TaxCost_{s(i)}$	1.987	1.654	2.736**	2.277*
$*Post86_t$	(1.732)	(1.418)	(1.294)	(1.202)
Org. Effects	✓	✓	✓	✓
Year Effects	✓		✓	
Year*Region Effects		✓		✓
Macro Controls			✓	✓
Observations	4771	4771	4771	4771
R-squared	0.915	0.915	0.915	0.915
Number of Orgs	908	908	908	908

See notes to table 2 for description of variables. The sample *only* includes charities excluded for violating one of the rules for dropping non-local charities, but otherwise meeting the conditions outlined in section 4.1. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

Table 11: Continuous Difference-in-Difference (Excluding Outliers)

	(1) Drop top and bottom most volatile 1 percent	(2) Drop top and bottom most volatile 5 percent
$\Delta_{86-88} TaxCost_{s(i)}$	-2.810**	-2.654*
$*Post86_t$	(1.262)	(1.374)
Org. Effects	✓	✓
Year Effects	✓	✓
Observations	16508	15162
R-squared	0.874	0.892
Number of Orgs	3169	2901
Difference test (p-value)	0.013**	0.0521*

See notes to table 2 for description of variables. The sample excludes charities with variance in charitable contributions during the sample years above or below percentile thresholds. "Difference test" reports a p-value for difference between this subsample and the main sample used in table 2. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

Table 12: Probability of Donation by Income and Cause

	Coeff. ln(Income)	Share Contrib.		Coeff. ln(Income)	Share Contrib
Religious	0.0248	68.9%	Environment	0.0703***	10.2%
	(0.0355)			(0.0236)	
Community	0.0480***	7.17%	Education	0.146***	26.6%
	(0.0178)			(0.0318)	
Cultural	0.0717***	10.41%	International Peace	0.0331*	7.39%
	(0.0218)			(0.0190)	
Youth	0.0960***	16.48%	Combined Purpose	0.172***	45.68%
	(0.0278)			(0.0351)	
Health	0.126***	30.6%	Other	0.00360	9.65%
	(0.0348)			(0.0242)	
For Needy	0.101***	45.68%			
	(0.0371)				

Data are taken from the PSID/COPPS survey of charitable contributions. The first column shows the coefficient on log income, where the dependent variable is equal to 1 if the household reported a contribution to the particular cause in that year and 0 otherwise (*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$). The second column reports the raw share of observations with a contribution reported. See section 7 for more detail.

Table 13: Distribution of Charities by Sector

NTEE Sector	Example	Orgs.	Obs.
A - Arts, Culture, and Humanities	San Diego Museum of Art	182	824
B - Education	Hendrix College	1027	4984
C - Environmental Quality, Protection, and Beautification	Aspetuck Land Trust	18	81
D - Animal-Related	Humane Society of Marin County	15	60
E - Health	Children's Medical Center of Dallas	1390	6860
F - Mental Health, Crisis Intervention	Philadelphia Psychiatric Center	46	197
G - Diseases, Disorders, Medical Disciplines	Dana-Farber Cancer Institute	14	72
H - Medical Research	Hermann Eye Fund	33	157
I - Crime, Legal Related	Mass. Society for Prevention of Cruelty to Children	14	65
J - Employment, Job Related	Blind Industries and Services of Maryland	15	65
K - Food, Agriculture, and Nutrition	Jackson County Meals Service	3	16
L - Housing, Shelter	Presbyterian Retirement Homes of Birmingham	25	116
M - Public Safety	Tacoma Mountain Rescue	5	16
N - Recreation, Sports, Leisure, Athletics	The Fresh Air Fund	18	81
O - Youth Development	Boys and Girls Clubs of Metro Atlanta	26	131
P - Human Services - Multipurpose and Other	YWCA of Walla Walla	428	2047
Q - International, Foreign Affairs, and National Security	Asia Foundation	3	13
R - Civil Rights, Social Action, Advocacy	Anti-Defamation League	1	6
S - Community Improvement, Capacity Building	Junior League of Detroit	12	49
T - Philanthropy, Voluntarism, and Grantmaking Foundations	United Way of Santa Clara County	165	808
U - Science and Technology Research Institutes, Services	University City Science Center	18	87
V - Social Science Research Institutes, Services	Center for Advanced Study in the Behavioral Sciences	2	10
W - Public, Society Benefit - Multipurpose and Other	Hebrew Free Loan Association of San Francisco	7	35
X - Religion Related, Spiritual Development	Upper Peninsula Bible Camp	23	98
Y - Mutual/Membership Benefit Organizations, Other	Lower Marion Township Police Pension Association	1	4
Total		3491	16882

Table 14: Regressions Testing Differential Tax Effects By Sector

Major Sector	$\Delta TaxCost_s$ $*Post86$	$Post86$ $*SectorS$	$\Delta TaxCost_{s,q}$ $*Post86$ $*SectorS$	Sector Joint Test
A- Culture	-3.774***	-0.914	6.173*	0.001***
	(1.411)	(0.627)	(3.342)	
B - Education	-4.493**	-0.379	3.421	0.000***
	(1.809)	(0.406)	(2.199)	
E - Health	-0.715	1.047**	-7.273***	0.000***
	(1.285)	(0.521)	(2.803)	
P - Human Services	-4.093***	-0.996	5.260	0.267
	(1.450)	(0.623)	(3.371)	
T - Philanthropy	-3.496**	0.336	-0.704	0.004***
	(1.416)	(0.646)	(3.523)	

Sample is identical to the one used in table 2. All regressions include controls for organization fixed effects, region-by-year effects, and state-level macroeconomic variables. Additional interaction terms with sectoral indicators are reported; see specification of equation 5 in section 7. "Joint test" reports p-values for the hypothesis that both sector interaction coefficients equal zero. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

Table 15: Continuous Difference-in-Differences, Split by Income Quantiles

Income Group	$\Delta TaxCost_{s,q}$ $*Post86$	$Residual$ $*Post86$	Income Group	$\Delta TaxCost_{s,q}$ $*Post86$	$Residual$ $*Post86$
Bottom 10%	-3.271**	-3.560	6th	-1.084	-6.536***
	(1.416)	(2.495)		(1.904)	(1.985)
2nd	-3.274**	-1.460	7th	-2.097	-5.217**
	(1.273)	(2.796)		(1.316)	(2.080)
3rd	-4.651**	-6.459**	8th	-2.178*	-4.784*
	(2.208)	(2.850)		(1.125)	(2.552)
4th	-0.697	-3.436**	9th	-2.755***	-0.517
	(1.691)	(1.517)		(1.046)	(3.887)
5th	1.514	-6.103***	Top 10%	-2.760***	3.086
	(2.261)	(1.716)		(0.899)	(3.686)
Top 5%	-3.104***	0.652	Top 1%	-2.876*	-4.872*
	(1.049)	(3.217)		(1.528)	(2.498)

All regressions are on the main sample and include organization effects, region-by-year effects, and state-level time-varying macroeconomic variables (population, unemployment, per capita income, poverty rate, and gross state product). See the description in section 7 and in the data appendix for further explanation. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

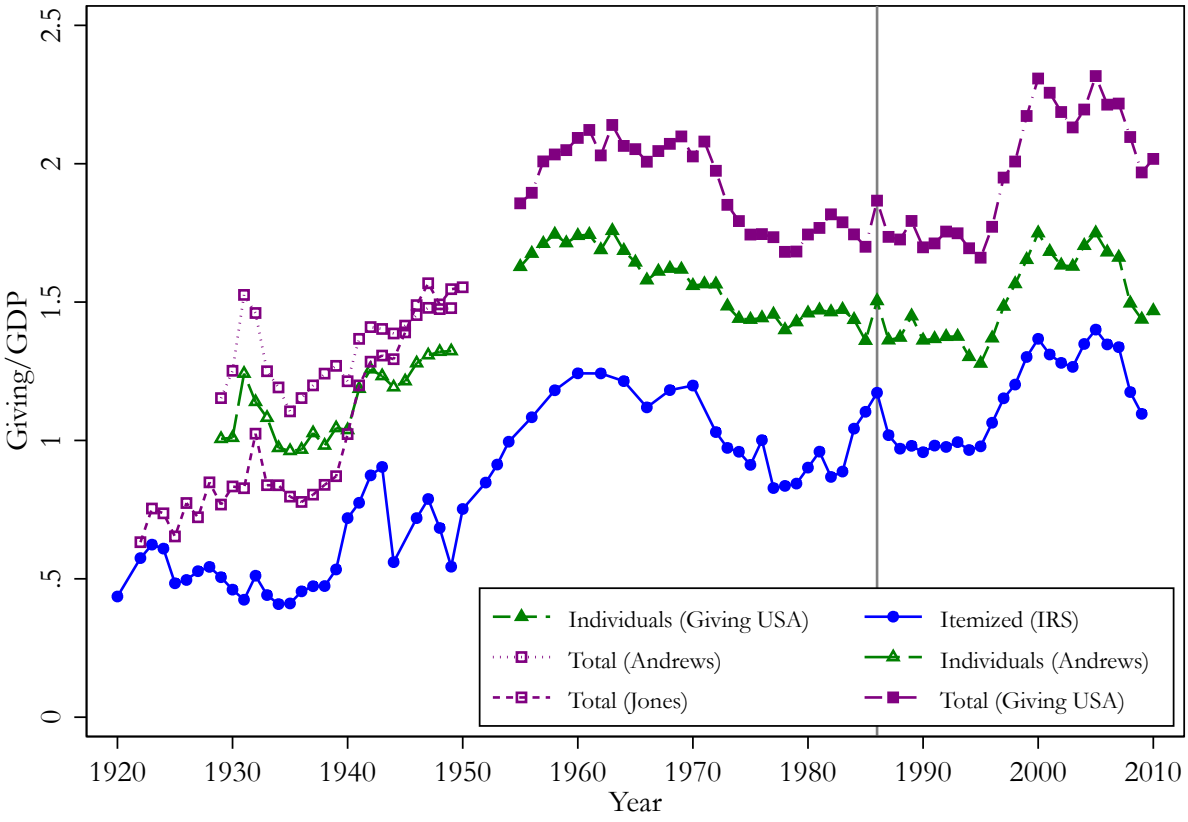
Table 16: Real Counterfactual Contributions, 1985-88

Real Income Tier	1985 Real Income ($ bil.)	1985 Real Contrib. ($ bil.)	1985 Contrib. / Income	1988 Real Income ($ bil.)	1988 Real Contrib. ($ bil.)	1988 Contrib. / Income	1988 Income x 1985 Share Contributed
$100-200K	1140	27.70	2.43%	1180	28.00	2.37%	28.67
$200-500K	342	10.40	3.04%	470	12.10	2.57%	14.29
$500-1000K	89	4.51	5.08%	184	4.50	2.45%	9.36
≥$1000K	96	7.71	8.03%	322	10.80	3.35%	25.86
Remainder	3340	72.05	*2.16%*	3600	80.48	*2.24%*	80.48
Total	5007	122.37		5756	135.88		158.66
Change						11.04%	29.66%

Table notes: All dollar values are inflated to real 2012 dollars using the Consumer Price Index. Data for high-income households is taken from the IRS public-use cross-sections. "Contributions" defined as the sum of current-year cash and non-cash contributions. "Income" is the sum of: wages and salaries, dividends, interest income, alimony, business income, Schedule E income, pensions and annuities, farm income, unemployment insurance, capital gains, and other income. Each income tier excludes tax returns which did not file itemized deductions. "Remainder" is total real contributions estimated by Giving USA, less the sum of itemized contributions from high-income itemized returns, estimated to be $122.37 billion in 1985 and $135.88 billion in 1988 (Giving USA 2013, Table 18).

Figures

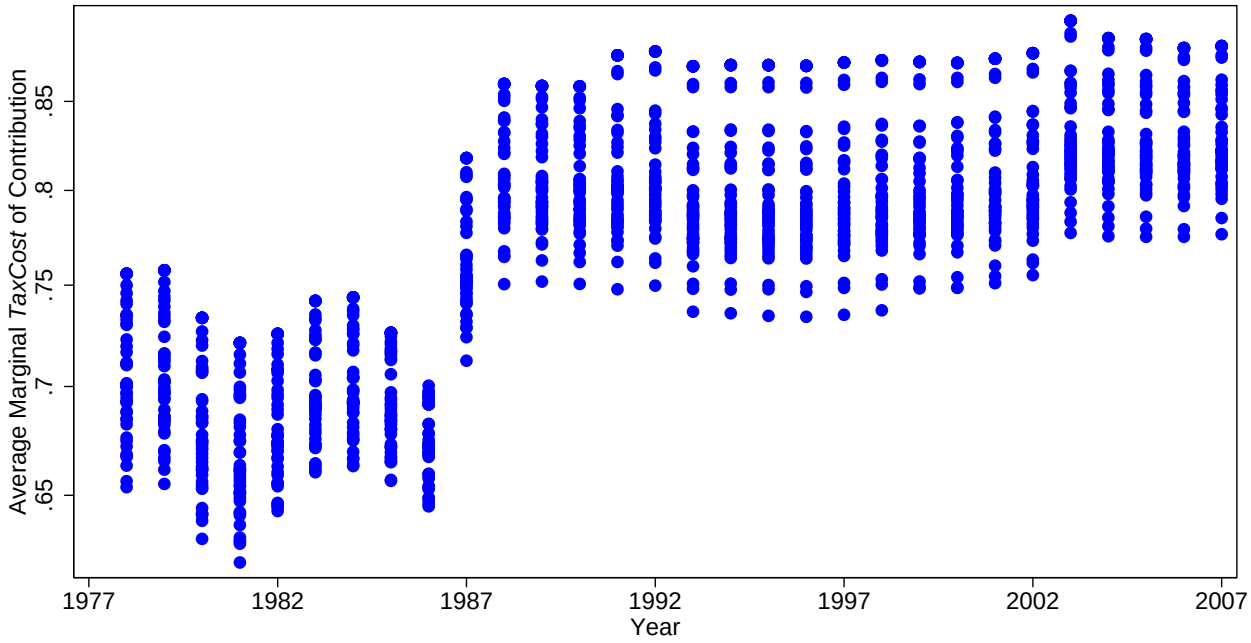
Figure 1: Contributions/GDP, 1919-2010



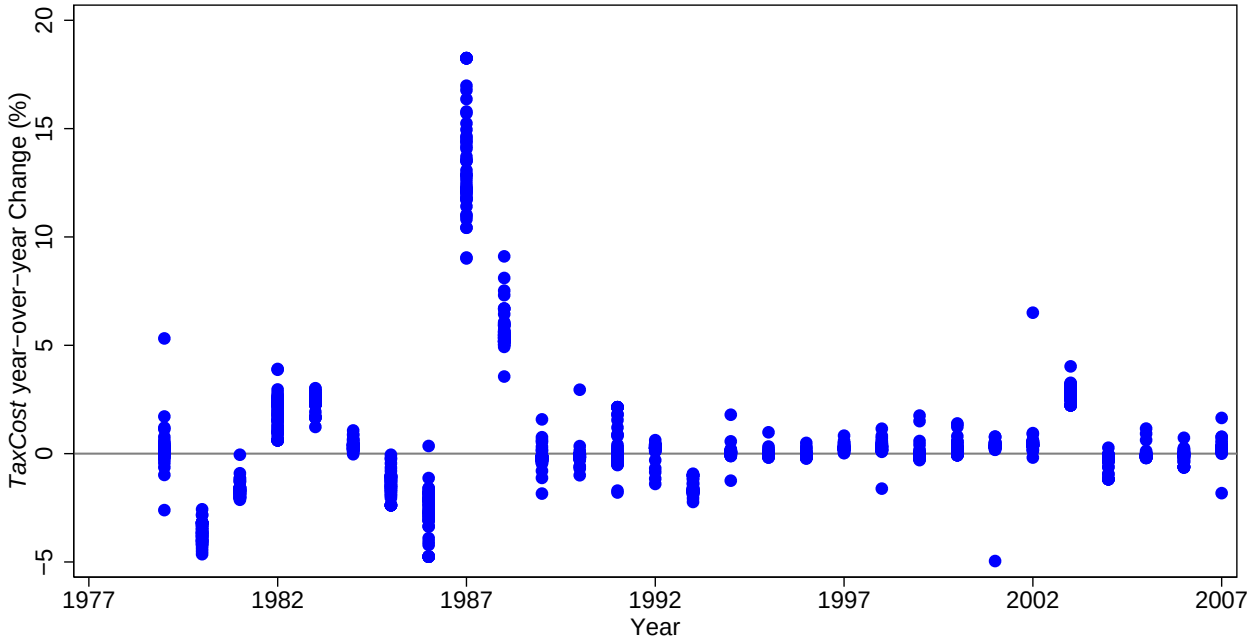
Sources: Andrews (1950) estimates personal contributions for itemizers and non itemizers from Survey of Current Business and Statistics of Income; Jones (1954), totals from Statistics of Income aggregates; Giving USA 2013 from various sources; Itemized contributions from Statistics of Income; nominal GDP from Bureau of Economic Analysis and from Carter et al., eds (2006, Table Ca9-19). Total contributions includes charitable giving not out of living persons' income, including bequests, gifts out of foundations, and corporate contributions.

Figure 2: Tax Cost of Giving

(a) Tax Price by State and Year

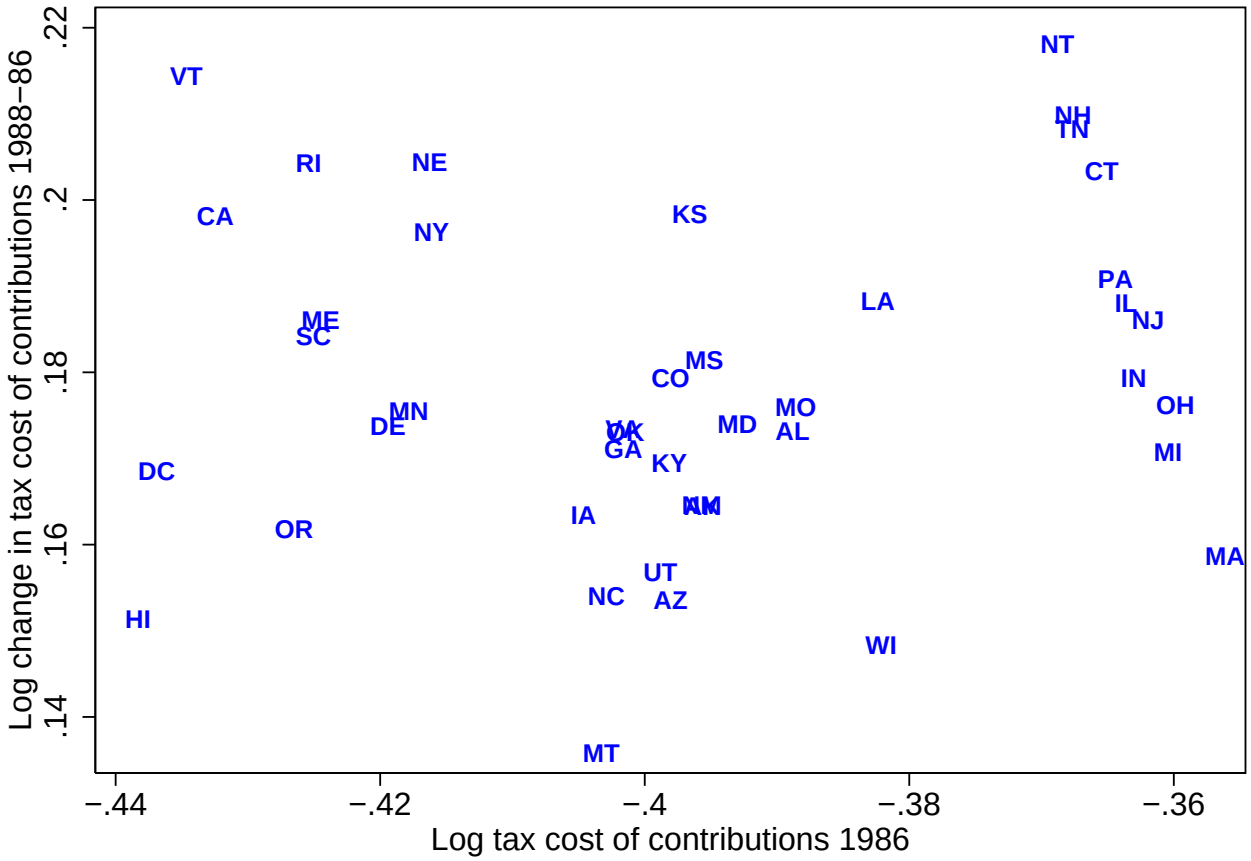


(b) Change in Tax Price by State and Year



Notes: Each dot in panel (a) represents the marginal tax cost of giving, averaged over a fixed sample of returns, in one state in one year. Each dot in panel (b) represents the year-over-year percentage change in tax cost. Tax cost of giving is calculated using the NBER TAXSIM calculator for a nationally representative cross-section of 1984 tax returns and weighted by reported contributions. See the Data Appendix for details of the calculation.

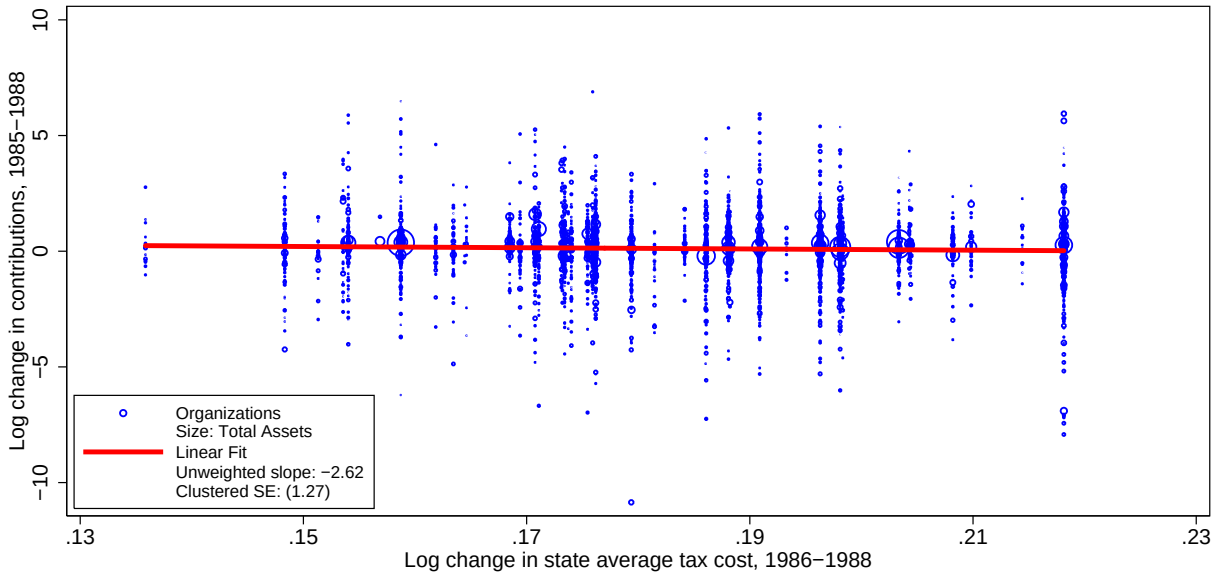
Figure 3: Change in Tax Price vs. pre-TRA86 Tax Price



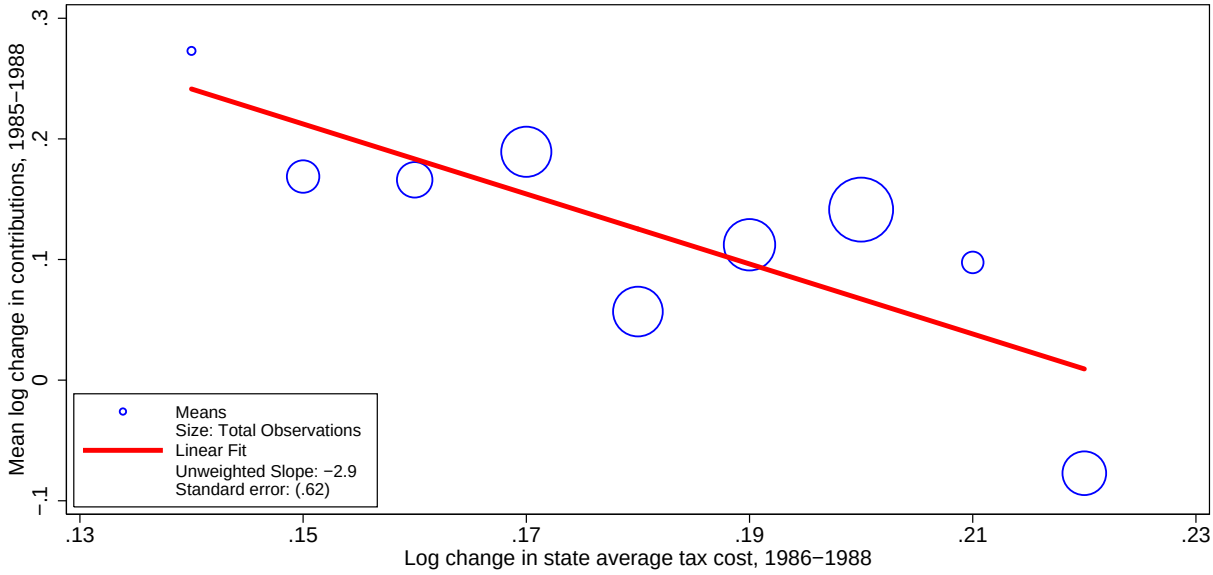
Each point represents total change in a measure of average tax cost of giving for one state income tax policy. The point labeled "NT" represents states with no state income tax. All other points are labeled using state postal abbreviations. The horizontal axis plots the log average cost of giving ($\ln(1 - \textit{marginal tax rate})$) in 1986. The vertical axis plots change in log average cost of giving ($\ln(1 - mtr_t) - \ln(1 - mtr_{t-1})$) from 1986 to 1988. See the Data Appendix for a precise description of the average tax cost variable's calculation.

Figure 4: 1985-8 change in Contributions vs. Change in Avg. Tax

(a) Individual Public Charities

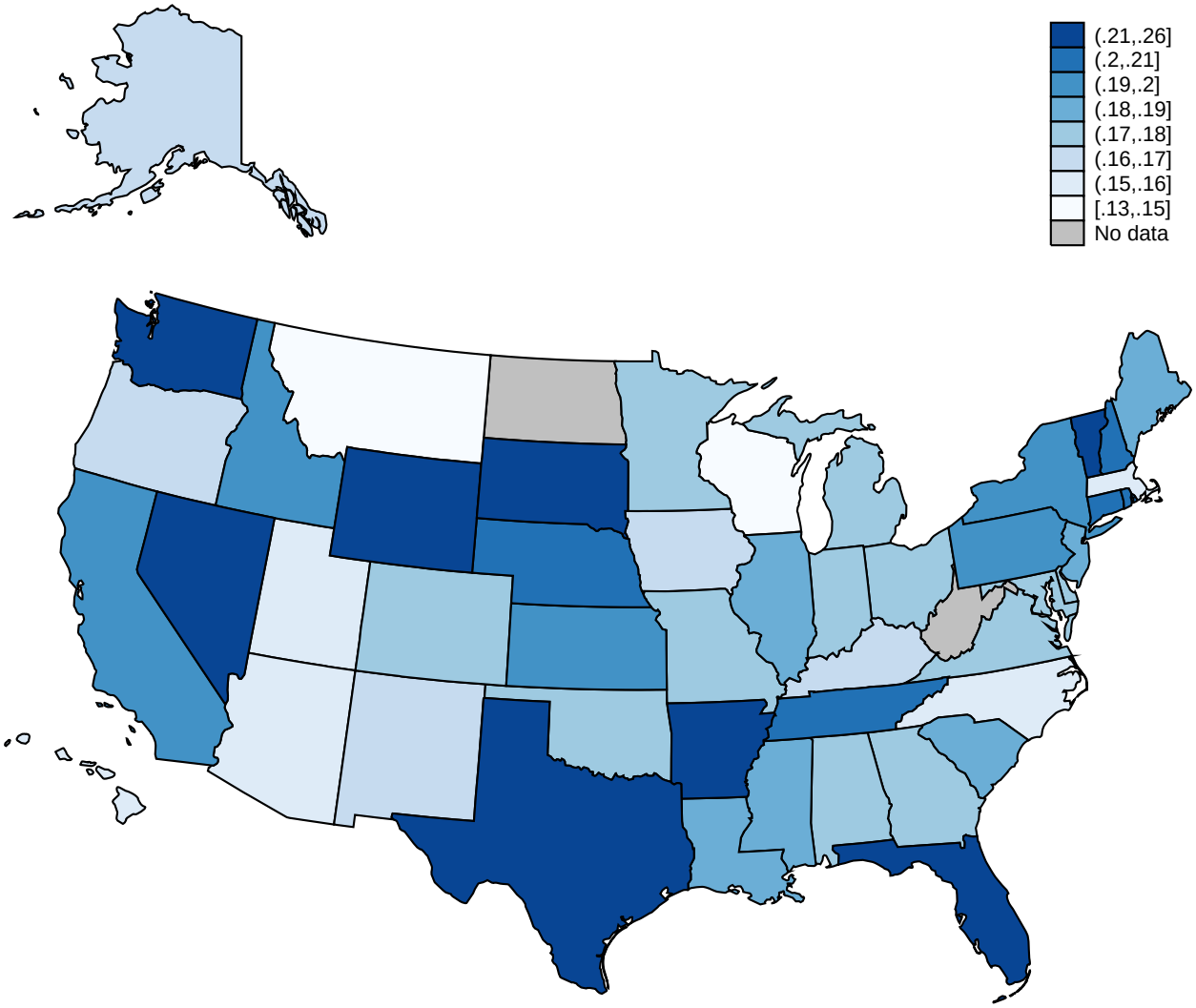


(b) Mean Change by Tax Bin



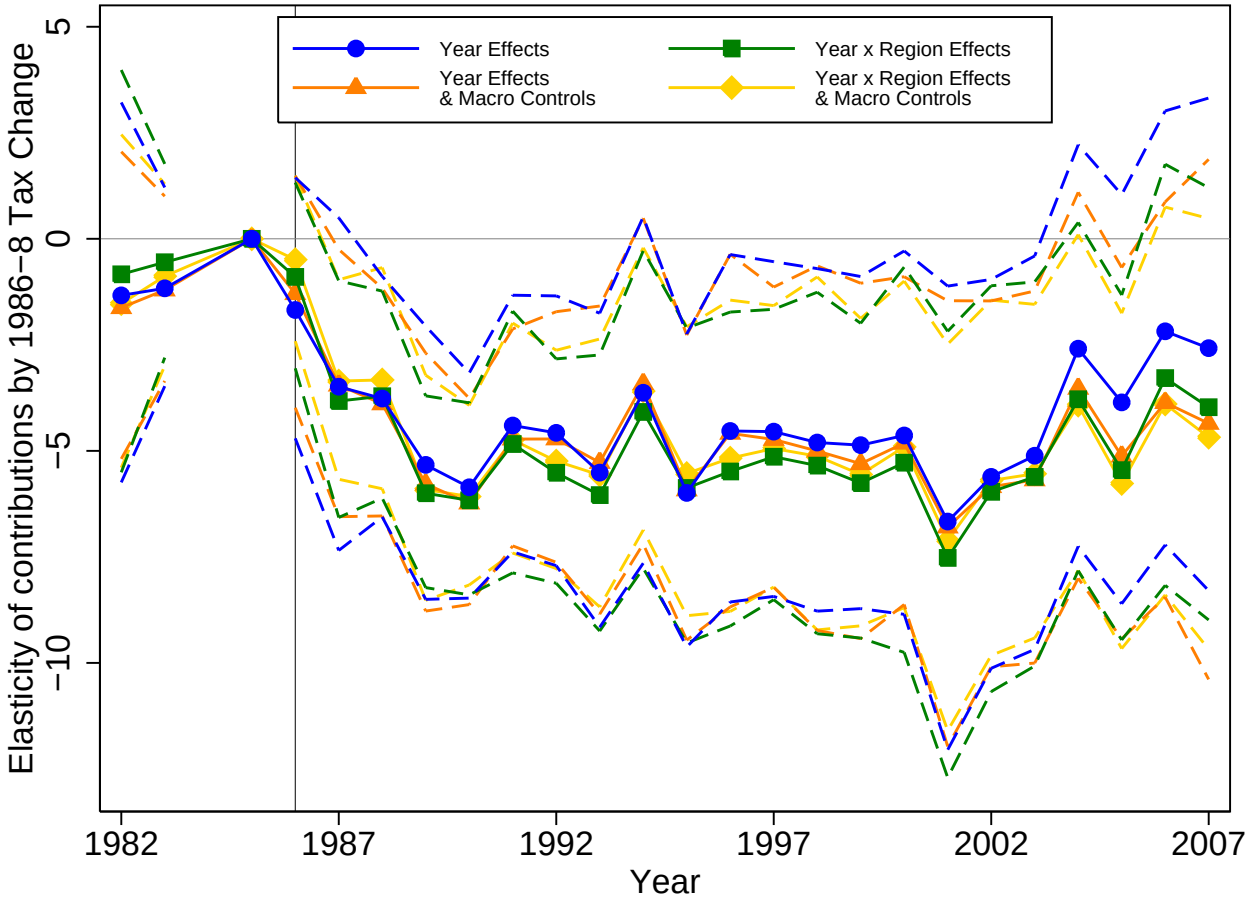
Panel (a) plots the log change direct public support for individual public charities from 1985 to 1988 (on the vertical axis) against the log change in average tax cost of a charitable contribution from 1986 to 1988 (horizontal axis). Blue markers represent individual charities and are scaled by gross assets at the end of fiscal 1988. A red line marks the unweighted linear fit through the plotted charities. Direct public support data are taken from the 1985 and 1988 Statistics of Income Form 990 data set; all charities reporting strictly positive contributions in both years and filing in states other than North Dakota and West Virginia are plotted. Panel (b) aggregates the data from panel (a) for easier display. Blue circles represent the unweighted mean of log tax changes for all the organizations in states with log tax changes closest to even hundredths. (That is, bins are 0.14 ± 0.05, 0.15 ± 0.05, …, 0.22 ± 0.05.) Blue marker size represents total observations by tax bin.

Figure 5: Tax Cost Treatment Variable by State



Notes: Darker states had greater increase in the log average cost of a charitable contribution from 1986 to 1988. See the Data Appendix for details of the calculation of the average tax cost variable.

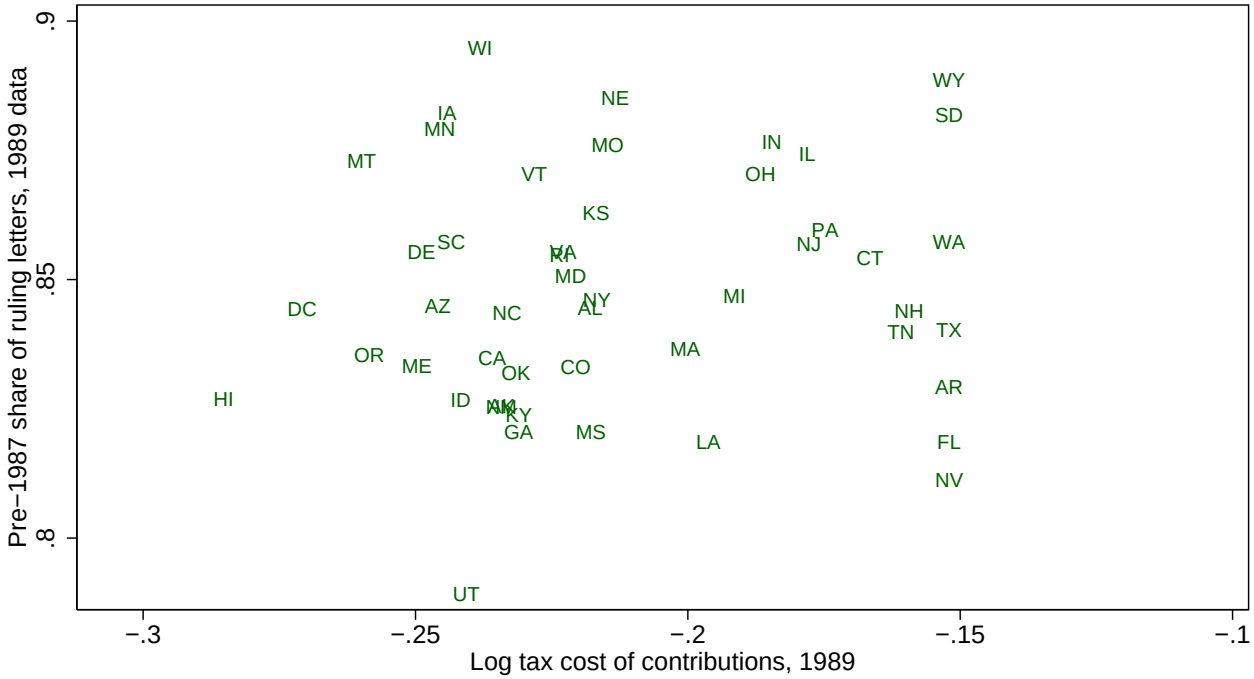
Figure 6: Time-varying Coefficients on Tax Change Treatment



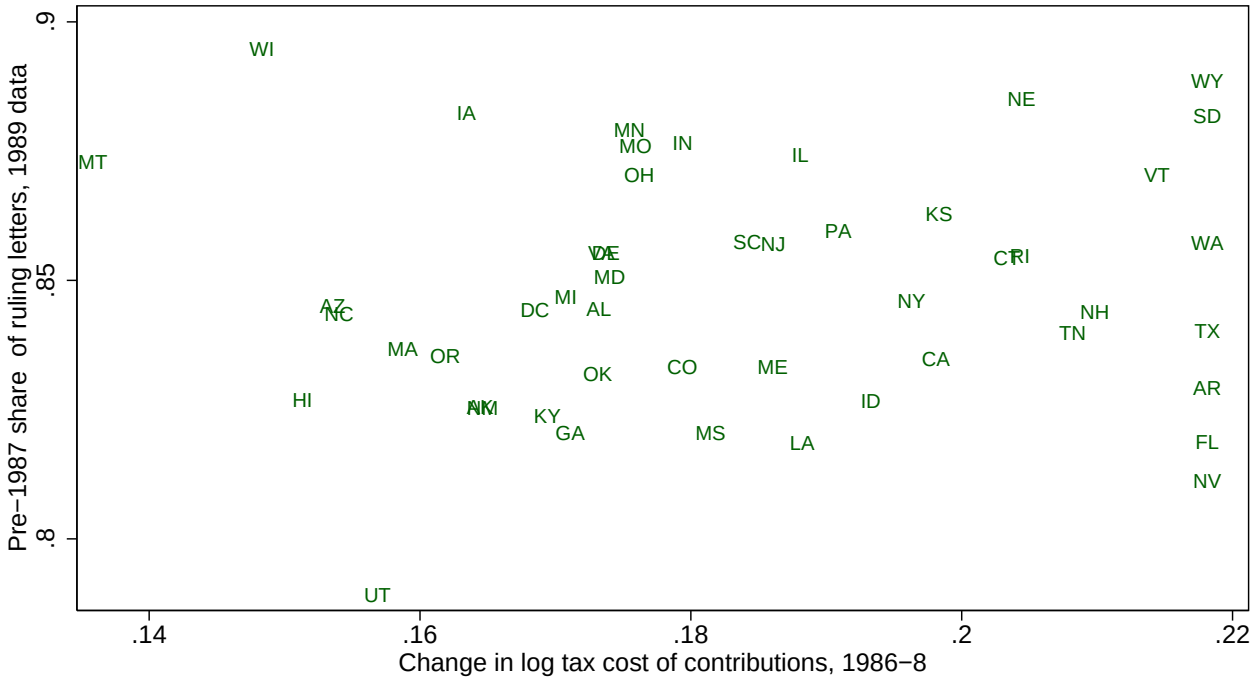
Y-axis is the coefficient on the 1986–1988 change in log average tax cost by state for year t. Comparison (omitted) year is 1985. Dashed lines plot pointwise 95% confidence intervals using state-clustered standard errors. See discussion of regression equation 2 in section 5 for more detail.

Figure 7: Exemption Letter Share as Test of Entry and Exit

(a) Share of Older Orgs. By Tax Rate, 1989

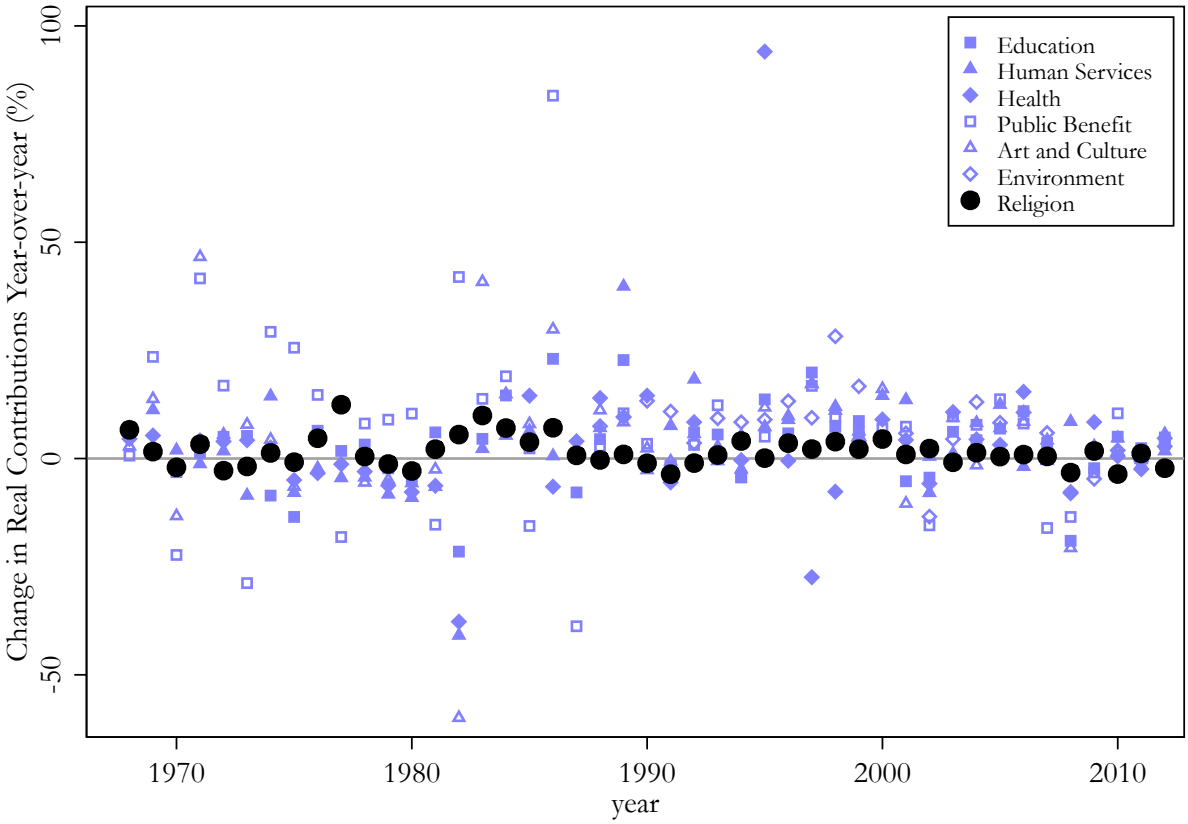


(b) Share of Older Orgs. By Tax Change, 1989



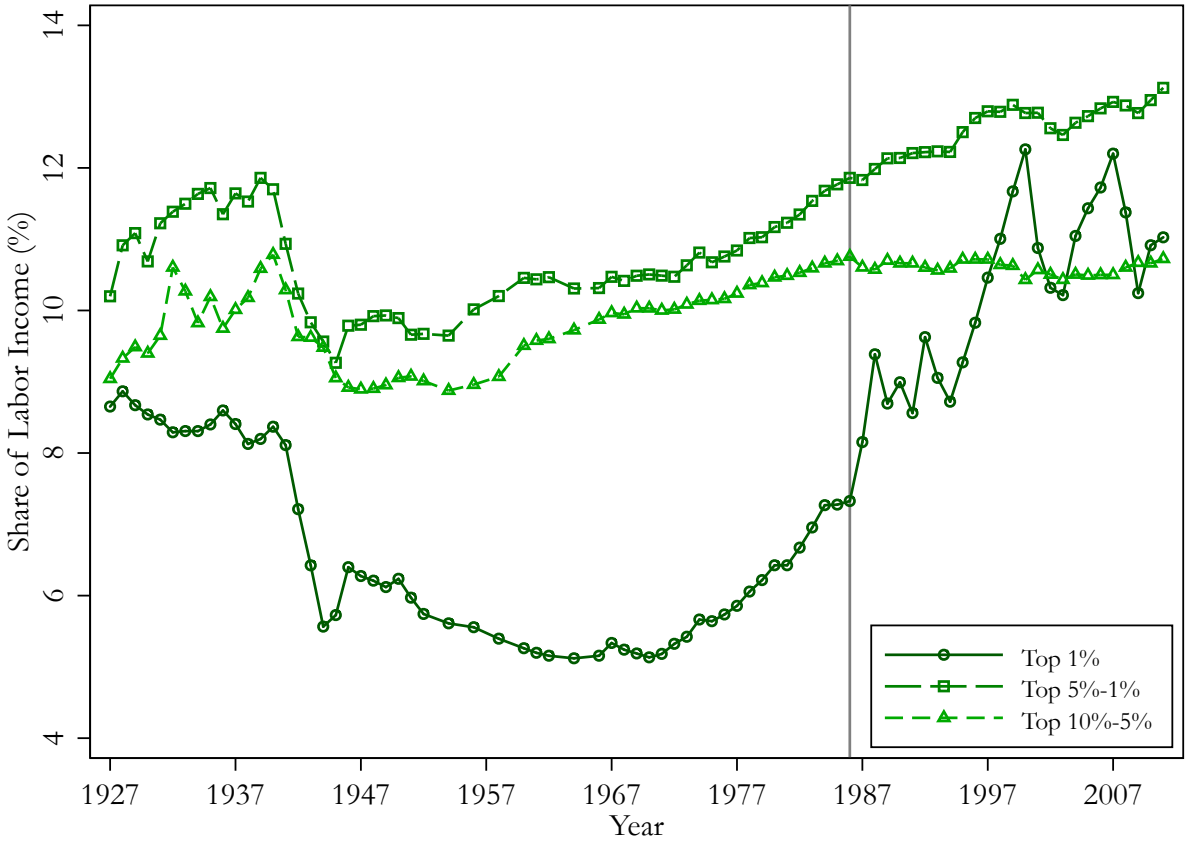
Both Y-axes plot the share of charities in the 1989 IRS Core PC Files with tax exemption letters data 1986 or earlier. In panel (a), the X-axis plots the log of state average tax cost of giving in 1989. In panel (b), the X-axis plots the change in state average tax cost of giving from 1986 to 1988. Points are labeled using state postal abbreviations.

Figure 8: Year-over-year growth in giving by sector



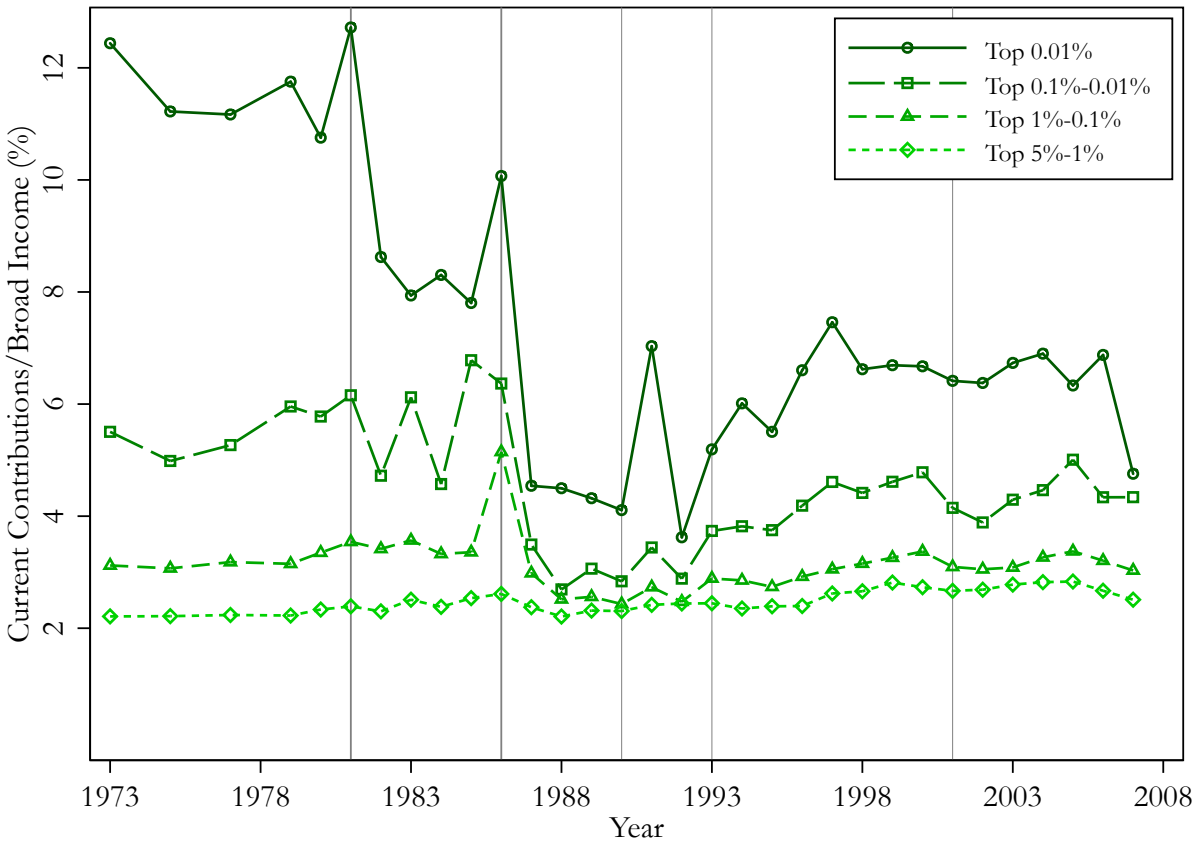
Source: Lilly Family School of Philanthropy, Indiana University/IUPUI (2013).

Figure 9: Income Share of Top Fractiles



Source: Piketty and Saez (2003), updated data.

Figure 10: Share of broad income contributed by high-income fractiles



Tax return data are from the IRS Public Use File maintained by the National Bureau of Economic Research. "Broad Income" follows Gruber and Saez (2002) by excluding capital gains and social security income.

A Data Appendix

A.1 IRS/NCCS 990 Data

My sample of IRS form 990 data is taken from the IRS Statistics of Income micro data, as cleaned and documented by the Urban Institute's National Center for Charitable Statistics (NCCS). This is a detailed data set including most data items on the form 990. The data are tiered by asset classes, including 100% of the largest organizations and decreasing shares of smaller organizations by total assets, with thresholds for asset size varying a little bit each year; however, the same small organizations tend to be observed each year of the panel, indicating that these are *not* cross-sections selected by stratified random sampling but that the IRS has tried to make a somewhat balanced panel with extra weight on the largest organizations. I'm still trying to find documentation of the exact selection methodology.

The NCCS variable names of 990 data used in this paper are tabulated in table 17.

Table 17: Form 990 data items by NCCS variable code

	1982-1999	2000-2007
Employer Identification Number	`ein`	`ein`
Organization Name	`name`	`name`
State	`state`	`state`
Primary Metropolitan Area	`pmsa`	`pmsa`
Major Subsector (NTEE)	`ntee1`	`ntee1`
Major Subsector (12 groups)	`ntmaj12`	`ntmaj12`
Total Revenue	`e047`	`r270`
Total Contributions and Grants	`e024`	`r040`
Direct Contributions	`e021`	`r010`
Indirect Contributions	`e022`	`r020`
Government Grants	`e023`	`r030`
Program Service Revenue	`e025`	`r050`
Total Assets, Beginning of Year	`e177`	`a030`
Total Assets, End of Year	`e178`	`a180`
Filed Group Return	`e012`	`cond`

A.2 TAXSIM Cost of Giving

The tax cost of giving measure used in this paper is created by estimating a first-dollar cost of giving cash for a constant set of returns, indexed for inflation and calculated for each state in each year. The only change in the measure is therefore in state and federal laws.

I start with the IRS Public Use File for 1984, a cross-sectional sample of 79,556 individual income tax returns for that year. For each state s and year t from 1979 to 2007, I (1) replace the year variable (`data103`) with year value t; (2) replace the state variable (`data6`) with numeric state code s; (3) replace variables for cash contributions (`data58`), gifts of appreciated assets (`data59`) and carryover contributions (`data60`) with zero values; and (4) use the Consumer Price Index to adjust all other money variables from year-1984 dollars to year-t dollars. This modified data set is fed into the `taxpuf9` FORTRAN program, which calculates the federal and state tax income tax for each return i — call them $Federal^0_{i,s,t}$ and $State^0_{i,s,t}$. I then repeat the calculation,

Table 18: Change in Average Tax Cost of Giving by State, 1986 to 1988

changing only the value of cash contribution to $10. The individual's tax cost of giving is calculated as the change in total income tax liability:

$$TaxCost_{ist} \equiv \frac{\left(Federal^{0}_{i,s,t} + State^{0}_{i,s,t}\right) - \left(Federal^{10}_{i,s,t} + State^{10}_{i,s,t}\right)}{10} \tag{7}$$

For a small number of observations, the implied marginal rate can be very large. I censor $TaxPrice_{ist}$ above at a marginal rate of 100% and below at 0% before aggregating.

The state-year-level tax cost is then calculated by taking a mean weighted by sampling weight (`data1`) and reported contributions (`data58+data59+data60`).[26]

$$TaxCost_{st} = \frac{\sum_i \texttt{data1}_i * (\texttt{data58}_i + \texttt{data59}_i + \texttt{data60}_i) * TaxCost_{ist}}{\sum_i \texttt{data1}_i * (\texttt{data58}_i + \texttt{data59}_i + \texttt{data60}_i)} \tag{8}$$

A.3 Guidestar Mission Statement Data

To obtain a dataset of organizations' mission statements, I extract 42,930 unique employer identification numbers (EINs) for organizations in the Statistics of Income file. I then extract mission statements corresponding to each organization from the Guidestar web site (`www.guidestar.org`) using a bash (Unix command-line) script that (1) uses the `wget` command-line utility to scrape the mission statement web page for each organization by looping over EIN values and plugging them into the appropriate URL, (2) uses Perl regular expressions and recurrent patterns in the HTML code to transform each web page into a file containing just the EIN and the Mission Statement and similar descriptive information, (3) stacks all these cleaned-up files into a single tab-delimited data set of organization mission statements.

Of the 42,930 EINs attempted, 33,719 had retrievable mission statements; 4,015 were in the Guidestar database but had no recorded statement; 5,196 were not in the Guidestar database.

B Additional Estimates

B.1 Median State Change as Treatment/Control Divide

The continuous difference-in-differences specification used in section 4.2 of this paper implicitly assumes a log-linear relationship between change in the tax cost and change in contributions. This assumption can be relaxed somewhat by splitting states by tax change into "treatment" and "control" groups and comparing across the two. The downside of this alternative specification is the loss of information within the state groups.

I use above- and below-median state treatment groups to conduct a difference-in-difference analysis of individual nonprofits. I estimate

$$\ln(Contributions_{it}) = \alpha_i + \beta D86_{s(i)} * Post86_t + \delta_t + \mathbf{X}'_{\mathbf{st}}\boldsymbol{\gamma} + \varepsilon_{it} \tag{9}$$

where $Contributions_{it}$ is real direct contributions reported by organization i in year t; δ is a year or region-by-year effect; $D86$ is equal to 1 (0) if state $s(i)$ has tax price change above (below) median for 1986-8; *Post86* is equal to 0 for years 1982-3 and 1985 and equal 1 for years 1988-2007; α_i is an organization fixed effect. The coefficient of interest is β, which captures the difference in contributions between states with above- versus below-median

[26] Because there was an above-the-line contribution in 1984, non-itemizers had an incentive to report their contributions in the 1984 tax return data. Weighting by reported contributions will be incorrect to the extent that contributions are misreported.

changes in tax price following the TRA86. State labels in figure 3 are coded by control and treatment groups; each state's tax cost change and designation as treatment or control is also reported in the appendix.

The results of this regression are reported in table 19. For the basic version of the regression, reported in column 1, organizations located in state with an above-median tax cost increase receive about 14% lower direct contributions than organizations in states with below-median increases. The size of this gap is even larger when we add region-by-year effects (-20%, column 2), state-year macro variables (-15%, column 3) or both (-16%, column 4). All of these estimates are statistically different from zero at the 5% level using state-clustered standard errors. For a mean log difference in the differences across states of 0.03, these estimates translate into an elasticity of contribution receipts with respect to average tax cost of -4 to -5. (That is, a one percent increase in the average tax cost is associated with about a four percent decline in contribution receipts.)

Table 19: Difference-in-Difference (at Median)

	(1)	(2)	(3)	(4)
	Log Direct Contributions			
$D86_{s(i)} * Post86_t$	-0.141**	-0.202***	-0.147***	-0.155***
	(0.0632)	(0.0593)	(0.0449)	(0.0463)
Org. Effects	✓	✓	✓	✓
Year Effects	✓		✓	
Year*Region Effects		✓		✓
Macro Controls			✓	✓
Observations	16882	16882	16882	16882
R-squared	0.861	0.862	0.862	0.862
Number of Orgs	3273	3273	3273	3273

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$. Standard errors clustered by state.

B.2 Year-varying β_t estimates

Section 5 tests for pretrends and for intertemporal shifting using time-varying coefficients on the treatment variable (1986–1988 change in tax cost). These estimates are plotted in figure 6. Table 20 reports the point estimates and standard errors.

Table 20: Time-varying Continuous Treatment Estimates

Year	Log Direct Contributions			
1982	-1.333	-0.837	-1.624	-1.528
	(2.321)	(2.458)	(1.876)	(2.035)
1983	-1.167	-0.552	-1.207	-0.882
	(1.214)	(1.184)	(1.129)	(1.110)
1986	-1.679	-0.898	-1.293	-0.492
	(1.593)	(1.135)	(1.416)	(1.011)
1987	-3.487*	-3.824**	-3.450**	-3.354***
	(2.031)	(1.445)	(1.633)	(1.219)
1988	-3.766**	-3.711***	-3.892***	-3.327**
	(1.470)	(1.265)	(1.391)	(1.351)
1989	-5.331***	-5.999***	-5.783***	-5.911***
	(1.668)	(1.171)	(1.576)	(1.375)
1990	-5.858***	-6.166***	-6.230***	-6.077***
	(1.376)	(1.173)	(1.260)	(1.097)
1991	-4.402***	-4.839***	-4.722***	-4.740***
	(1.567)	(1.599)	(1.325)	(1.405)
1992	-4.575***	-5.517***	-4.719***	-5.241***
	(1.647)	(1.371)	(1.531)	(1.333)
1993	-5.513***	-6.043***	-5.274***	-5.570***
	(1.918)	(1.686)	(1.882)	(1.636)
1994	-3.630*	-4.082**	-3.414*	-3.591**
	(2.116)	(1.940)	(1.990)	(1.724)
1995	-5.991***	-5.874***	-5.921***	-5.533***
	(1.912)	(1.923)	(1.864)	(1.765)
1996	-4.530**	-5.486***	-4.586**	-5.172***
	(2.122)	(1.918)	(2.154)	(1.902)
1997	-4.547**	-5.138***	-4.732**	-4.944***
	(2.045)	(1.774)	(1.834)	(1.720)
1998	-4.803**	-5.348**	-5.003**	-5.125**
	(2.092)	(2.086)	(2.227)	(2.156)
1999	-4.865**	-5.760***	-5.302**	-5.557***
	(2.029)	(1.923)	(2.171)	(1.878)
2000	-4.637**	-5.279**	-4.819**	-4.906**
	(2.220)	(2.354)	(2.003)	(1.995)
2001	-6.667**	-7.524***	-6.796**	-7.111***
	(2.833)	(2.726)	(2.722)	(2.361)
2002	-5.613**	-5.966**	-5.844**	-5.698**
	(2.376)	(2.479)	(2.235)	(2.170)
2003	-5.115**	-5.614**	-5.684**	-5.539***
	(2.403)	(2.346)	(2.273)	(2.038)
2004	-2.590	-3.783*	-3.525	-3.922*
	(2.453)	(2.127)	(2.358)	(2.052)
2005	-3.857	-5.454**	-5.122**	-5.768***
	(2.499)	(2.107)	(2.268)	(2.049)
2006	-2.180	-3.283	-3.861	-3.894
	(2.651)	(2.573)	(2.414)	(2.369)
2007	-2.578	-3.970	-4.353	-4.678*
	(3.009)	(2.640)	(3.177)	(2.631)
Org. Effects	✓	✓	✓	✓
Year Effects	✓		✓	
Year*Region Effects		✓		✓
Macro Controls			✓	✓