Charitable giving and tax policy in the presence of tax cheating: Theory and evidence from the U.S. and France*

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April 25, 2011

Abstract

We develop a model of charitable contributions in the presence of "cheating" contributions and present formulas for the optimality of tax subsidies for contributions. In addition to the standard price elasticity of reported charitable contributions, two new parameters appear in the formulas: the share of "cheating" contributions in total reported contributions and the price elasticity of "cheating" contributions. Then, we provide substantial evidence that ignoring cheating parameters is likely to lead to large deviations from the optimal subsidy. We use two tax enforcement reforms: the 1969 tightening of rules for contributions to private foundations in the United States and a 1983 French reform requiring taxpayers to document their contributions. In both cases, we find sizeable responses to the tax enforcement regime, implying that the share of "cheating" contributions that we estimate is significant. We also find that the price elasticity of reported contributions falls significantly after the 1983 French reform, allowing us to back out the price elasticity of "cheating" contributions. A simple calibration based on our estimates shows that the issue of tax evasion through charitable contributions is a first-order consideration for the design of optimal subsidies in the U.S. system.

JEL: C24, D64, H31

*We would like to thank Alan Auerbach, Raj Chetty, Stefano DellaVigna, Thomas Piketty, Emmanuel Saez, David Sraer, and seminar participants at UC Berkeley, for their helpful comments and suggestions. Financial support from the Russell Sage Foundation is gratefully acknowledged. We also thank Odile de Laurens for giving us access to data from Fondation de France.

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1 Introduction

Tax incentives for charitable giving have existed in the U.S. federal income tax system since 1917. In 2007, U.S. taxpayers reported in their income tax returns a total of $193.6 Bn in charitable contributions. This figure represents 2.2% of total adjusted gross income (AGI). The basis for subsidizing private charitable contributions is indeed well-established: Private charitable contributions finance many socially valuable activities (education, the arts, nonprofits, religious organizations, and so forth) and therefore have a positive external effect that can be encouraged with Pigouvian subsidization. Nevertheless, there still exists a substantial debate over the optimal level of the subsidy rate. The presidential administration of Barack Obama has recently introduced a proposal that would cap the subsidy rate for the top income-earning households. Other countries, such as France, have recently considerably increased the level of the tax subsidy for contributions in order to boost private provision of public goods (Fack & Landais (2009)). Policy recommendations in the debate over the optimal level of the subsidy rely on a large body of theoretical and empirical work (see Andreoni (2006) for a complete survey). Yet, this literature focuses almost exclusively on a single parameter, the price elasticity of contributions, which is implicitly assumed to be a sufficient statistic to infer tax policy.[1]

Surprisingly, there is very little discussion in the literature that the federal income tax deduction for charitable contributions is also an easy channel for tax evasion because of the permissive tax enforcement regime applicable to charitable gifts. Some studies have nevertheless shown that tax cheating may be a concern. Ackerman & Auten (2008) investigate contributions of used cars and find evidence of significant overvaluation of used cars by donors on their tax forms. Yermack (2008) analyzes contributions of stocks by CEOs to their own private foundations and finds that these gifts, which are not subject to insider trading laws, often occur just before sharp declines in their companies' share prices, suggesting that some CEOs backdate stock gifts to increase personal income tax

1. Crowding-out parameters (the extent to which public provision of a public good crowds-out private contributions to the public good) have also received some attention (Warr (1982), Kingma (1989), or Gruber & Hungerman (2007) for instance).

benefits. Slemrod (1989) and Feldman & Slemrod (2007) also try to measure tax evasion occurring through charitable deductions with audited and unaudited tax returns, respectively. But overall, there has been no general investigation into the extent of tax cheating through private charitable contributions, nor has there been any attempt to understand to what extent tax cheating may modify our normative approach to subsidizing private philanthropy.

The aim of this paper is to fill this gap and to show that tax cheating is a first-order phenomenon to assess optimal tax policies for charitable contributions. In particular, we unveil the existence of substantial tax evasion carried out through charitable deductions using natural experiments on tax enforcement in both the United States and in France. Building on this evidence, we provide a complete analysis of the implications of tax cheating for the optimal tax policy towards charitable contributions.

First, we derive a general framework to define the sufficient statistics to be estimated to assess the optimality of tax subsidies for contributions in the presence of tax cheating. Our optimal tax formula generalizes to the case of tax cheating the unit elasticity rule stating that the price elasticity of reported contributions was a sufficient statistic to infer tax policy. Our results show that, in the presence of tax cheating, three welfare-sufficient statistics must be estimated to assess tax subsidy optimality for charitable contributions. These statistics are the price elasticity of reported contributions, the share of contributions that is cheated, and the price elasticity of cheating contributions. These results can be compared with those of Chetty (2009a) which demonstrates that, in the presence of tax sheltering, the taxable income elasticity is no longer a welfare-sufficient statistic to calculate deadweight loss, which becomes a weighted average of taxable income and full income elasticities.

In the empirical part of the paper, we provide substantial evidence that cheating parameters are first-order and ignoring them is likely to lead to large deviations from the optimal subsidy because, first, the share of cheating contributions is important in most tax systems (and especially in the U.S. tax system) and, second, the price elasticity of cheating contributions is large, especially when receipts are not required to be attached to the tax return (as is still the case for most contributions in the U.S.). We estimate the cheating parameters using two natural experiments on tax enforcement in both the United States and in France. We first focus on a natural experiment that significantly modified tax enforcement of contributions to private foundations. In 1969, Congress passed a law preventing "self dealing" and other possibilities for abuses through contributions to private foundations. Annual creation of private foundations dropped by more than 80% between 1968 and 1970 suggesting that private foundations were largely used as tax sheltering vehicles. Moreover, the reform lowered incentives to cheat as it pertained to rich taxpayers who had private foundations, but did not affect taxpayers at lower levels of income. We therefore use a standard difference-in-difference strategy, and look at the effect of the reform on contributions reported by the top .01% of taxpayers relative to contributions of other top income groups not rich enough to set up their own private foundations. The results suggest that a very significant fraction (around 30%) of contributions reported by the very wealthy before 1969 were driven by tax avoidance or tax cheating purposes.

We then use a second natural experiment on tax enforcement that took place in France in 1983. This reform is very informative in the U.S. context because the reporting system in France before 1983 is very similar to the actual reporting system for charitable contributions in the Federal Income tax system. Before 1983, French taxpayers were only asked to keep a receipt of every charitable contribution they claimed on their tax return. From 1983 forward, the French tax administration requires that taxpayers attach these receipts to their tax return when claiming the charitable deduction. Total reported contributions dropped by more than 75% in 1983 relative to 1982. The advantage of the French reform is that it concerns all taxpayers. Given that the French tax incentive system worked at that time as a deduction of contribution from taxable income, there is heterogeneity in treatment due to taxpayers having different marginal tax rates. This gives us the opportunity to estimate the two cheating parameters of interest. We begin by estimating the share of contributions that is cheated, and then we turn to the estimation of the price elasticity of "cheating" contributions that we pin-down by estimating the variation in price elasticity of contributions between 1979 and 1984. We control for endogeneity of marginal tax rate variations in the cross-section by taking advantage of nonlinearities brought about by the functioning of a system of family income splitting in France. We find that in the absence of third-party reporting of charitable contributions, the share of contributions that is cheated is large and very sensitive to price, with a price elasticity of cheating contributions larger than one in absolute value.

The paper is organized as follows. The next section presents a general model of optimal subsidy in the presence of tax cheating. Section 3 presents empirical evidence on the magnitude of the cheating statistics derived from our model. We present two natural experiments on tax enforcement and use them to estimate the share of cheating contributions and the price elasticity of cheating contributions.

2 A model of optimal subsidy in the presence of tax cheating

This section analyzes how tax cheating modifies the optimal treatment of tax expenditures. We focus on the case of the optimal level of a subsidy for charitable contributions. We begin by explaining the intuition behind our model in the simple case of a pure public finance objective in which the government seeks to maximize the amount of private contributions, given the public finance cost of the subsidy. Then we move to a more general model of optimal subsidy with warm-glow of giving (Andreoni (2006)) and crowding-out of private contributions through direct provision of the public good (Kingma (1989)). We derive a formula indicating the welfare-sufficient statistics to be estimated to assess the optimality of the subsidy rate in the presence of tax cheating.

The positive external effects of charitable contributions may justify tax incentives towards charitable giving, and numerous empirical studies have analyzed the effect of tax subsidies towards private philanthropy. However, the normative side of the analysis has been much less investigated, and no study has ever provided precise policy recommendations to address the issue of tax avoidance through charitable deductions.[2].

In addition to the problem of the optimal treatment of tax expenditures, our model investigates the consequences of tax cheating on the optimal subsidy for charitable contributions. The distinction between illegal evasion and legal avoidance is not critical for our analysis: the term *cheating* is used as a general description of all evasion and avoidance behaviors that consist in using the charitable deduction for items that do not produce any positive externality.[3] Issues of tax evasion and tax avoidance have received growing attention in tax studies ever since the seminal work of Allingham & Sandmo (1972). Andreoni *et al.* (1998) and Slemrod & Stephan (2007) survey this literature. But, apart from Slemrod (1989), who shows that in the presence of tax evasion, Feldstein's *unit elasticity rule* does not hold, the normative implications of avoidance have never been raised for the analysis of the optimal policy for charitable contributions. Here,

2. Atkinson (1983) analyzes the optimal tax problem with a log functional form specification for the utility function in a model in which high-income households want to redistribute income to lower-income households. He then uses his optimal tax formula to study whether a deduction is more socially desirable than a flat-rate tax credit. Roberts (1987) investigates the issue of crowding-out of private contributions by direct public provision of a public good and derives a formula to determine whether direct funding of a public good via tax revenue is more desirable than subsidies to private contributions. Diamond (2006) analyzes the optimal subsidy for private donations in a nonlinear income tax schedule. His paper explores optimal policy, using first a model with standard preferences and then a model with warm glow of giving. Diamond's paper emphasizes an important point for welfare analysis with the warm-glow model of giving, namely, that the optimal policy with warm-glow preferences is highly sensitive to the choice of preferences that are relevant for a social welfare evaluation. Indeed, one may consider that including warm-glow preferences in the social welfare function is somehow double-counting the utility gain of contributions for individuals. This is a standard problem encountered in welfare analysis with nonstandard preferences (such as hyperbolic discounting models, for instance) as underlined by Bernheim (2008). Here we abstract from these issues and consider the warm-glow motive as part of the preferences to be included in the social welfare function. Our own model is similar to Saez (2004) who considers a very generalized model of optimal subsidy with a linear income tax and direct provision of public good by the government.

3. The fact that the distinction between avoidance and evasion is not necessarily relevant for deadweight loss analysis was already underlined by Chetty (2009a).

however, for the sake of simplicity, we do not model the tax enforcement technology per se, contrary to most models of tax evasion in which the level of evasion chosen at the individual's optimum depends on the probability of being detected, which varies with the tax enforcement technology. We investigate the optimality of the subsidy rate *for a given level of tax enforcement*. Two important reasons explain why we abstract from modeling the tax enforcement technology. First, we are mainly interested in the level of the optimal subsidy rate [4]. Second, the choice of the tax enforcement regime is by itself not a critical question, because one tax enforcement regime strictly dominates all the others, namely, *third-party reporting* of charitable contributions by nonprofit organizations. The technology for third-party reporting is in fact already in place, making a switch to this regime virtually free of cost. [5] And as shown by Kleven *et al.* (2009a) and Kleven *et al.* (2009b), cheating behaviors are close to zero with third-party reporting. Of course, greater enforcement might also entail nonpecuniary social costs, such as invasion of privacy (Slemrod (2006)) that we do not take into account here, but that may partly explain why third-party reporting is not yet generalized.

2.1 A simple case: unit elasticity rule with and without tax cheating

To explain how tax cheating affects the optimal tax policy for charitable contributions, we begin by focusing on a simple case of objective function in which the government only seeks to maximize the amount of private contributions, given the cost of the subsidy. This simple, objective function is actually not very far from what most governments have in mind when modifying the level of the subsidy rate, as shown by the recent debate about

4. Moreover, it is hard to consider tax enforcement technology as a well-behaved function of audit rates, as most models do. Tax enforcement is fundamentally discontinuous in the case of charitable giving and depends on different reporting regimes (whether households must keep receipts, can give away assets, can give to their private foundations, etc.).

5. The UK system has indeed already a third party reporting system for a large share of charitable contributions: through the gift aid scheme charities are entitled to reclaim a part of the tax paid by contributors, while taxpayers can reclaim the other part of the tax. This generates third party reporting of contributions by charities.

the Obama administration's proposal of capping the level of the subsidy for high-income households.

In the absence of tax cheating, this public finance objective yields a simple rule for assessing the optimality of the subsidy rate. The government's program is the following:

$$\text{Max}_{\tau}\ \text{W} = g - \tau g$$

where τ is the subsidy rate and g is the aggregate level of private charitable contributions in the economy. Then, it follows that:

$$\frac{dW}{d\tau} = -g - (1-\tau)\frac{\partial g}{\partial(1-\tau)} = -g(1+\varepsilon_g)$$

where $\varepsilon_g = \frac{dg}{d(1-\tau)}\frac{1-\tau}{g}$ is the elasticity of contributions with respect to $1-\tau$. ε_g is therefore sufficient to infer tax policy, and optimality is determined by the famous *unit elasticity rule* popularized by Feldstein & Clotfelter (1976): The subsidy should be increased if $|\varepsilon_g| \geq 1$.

The simplicity of this rule and the fact that it states that the elasticity of reported contributions is the only statistic necessary to determine the opportunity of raising the subsidy rate explains why most empirical studies have focused on measuring whether this elasticity was superior or inferior to one in absolute value (Auten *et al.* (2002), Bakija & Heim (2008), Clotfelter (1980)).

Introducing tax cheating into this simple framework nevertheless substantially modifies the sufficient statistics to be estimated to assess the opportunity for increasing the subsidy rate. If we assume that reported contributions are a mix of contributions producing externality ("True contributions" g) and contributions that do not produce any externality ("Cheating contributions" g_c), the government objective is now:

$$\text{Max W} = g - \tau g - \tau g_c$$

This yields:

$$\frac{dW}{d\tau} = -(g + g_c) - (1 - \tau)\frac{\partial g}{\partial(1 - \tau)} + \tau\frac{\partial g_c}{\partial(1 - \tau)}$$

The criterion for increasing the subsidy rate becomes $|\varepsilon_g| \geq \frac{1}{\alpha} + \frac{\tau}{1-\tau}\frac{1-\alpha}{\alpha}|\varepsilon_{g_c}|$. Or equivalently:

$$|\varepsilon_{g_T}| \geq 1 + \frac{1-\alpha}{1-\tau}|\varepsilon_{g_c}| \tag{1}$$

where $g_T = g + g_c$ stands for total reported contributions. $\alpha = \frac{g}{g_T}$ is the share of "true" contributions in total reported contributions. ε_{g_T} is the elasticity of total reported contributions with respect to $1-\tau$, and ε_{g_c} is the elasticity of cheating contributions with respect to $1 - \tau$. Equation 1 clearly states that the unit elasticity rule is no longer valid and that ε_{g_T} is no longer sufficient to infer tax policy. An elasticity of reported contribution greater than one in absolute value does not necessarily mean that the subsidy rate should be increased. One also needs to estimate ε_{g_c} and α. If $|\varepsilon_{g_c}|$ is large, or if the share $(1 - \alpha)$ of contributions not producing any externality is large, then focusing only on the elasticity of reported contributions can lead to substantial deviations from the optimal level of the subsidy. The intuition is straightforward. The larger the share of "cheating" contributions $(1-\alpha)$, the greater the reported contributions' elasticity overstates the true social gain of the subsidy. And the larger the elasticity of "cheating" contributions ε_{g_c}, the greater the revenue loss generated by an increase in the tax subsidy on "cheating" contributions.

2.2 A model of optimal subsidy with tax cheating

We now generalize the intuition of the previous subsection to a model of optimal subsidy for charitable contributions in the presence of tax cheating, with warm-glow of giving and crowding-out of private charitable contributions by direct public provision of public goods.

The setup of the model is as follows. There is a continuum of individuals with density $d\nu(i)$ over i, $i\epsilon I$, I being an index set. There are basically three goods in the economy: private consumption c, earnings z, and a contribution good g. The utility of individuals is increasing in c and decreasing in z, meaning that labor supply is costly. Concerning the contribution good, g enters positively in the utility function, which means that we allow individuals to derive positive utility from the fact of giving, following the warm-glow model of Andreoni (2006). To model the public good nature of contributions, we assume that the total level of contributions per capita G enters positively into the utility function of each individual. Since the government can contribute directly to the public good, G is the sum of private and public contributions to the public good ($G = G^0 + G^P$, G^0 being direct public provision of public good, and $G^P = \int g d\nu(i)$ is total private contributions). In addition, we consider each individual atomistic, so that G is considered as given by each individual to avoid results such as those found in Warr (1982). Finally, we take into account the possibility that individuals evade taxes through the contribution good [6]: individuals can report "cheating contributions" in their tax form and gain an extra subsidy on these cheating contributions. But cheating has a utility cost for individuals, reflecting the probability of being caught and getting a fine, or simply reflecting pro-social compliance preferences. This utility cost makes our evasion model formally comparable to a Allingham & Sandmo (1972) tax evasion model or a Slemrod-type avoidance model (Slemrod & Stephan (2007)).

The individual's program can therefore be summarized as follows:

$$\text{Max}_{c,z,g,g^c} U^i = u^i(c, z, g, g^c, G)$$

6. We consider here only the case where reported contributions and real contributions differ because of tax cheating, but our model easily generalizes to other cases where reported contributions and true contributions differ, like for instance because of underreporting of contributions.

$$\text{s.t.} \quad c + g + g_c \leq R + (1-t)z + \tau g + \tau g^c$$

where τ is the tax subsidy rate on contributions and t is the (linear) tax rate on earnings. Note that contrary to the actual US tax system, which works as a deduction of private contributions from taxable income, we do not link t and τ in our model, and formally consider a subsidy working as a tax credit. For a discussion of the optimality of a tax credit over a deduction from taxable income, see Atkinson (1983) or Saez (2004). We denote by $\nu^i(1-t, 1-\tau, G, R)$ the indirect utility function of individual i. Demand functions, given the tax parameters, are denoted by $z^i(1-t, 1-\tau, G, R)$ for earnings, $g^i(1-t, 1-\tau, G, R)$ for true contributions, and $g^{c^i}(1-t, 1-\tau, G, R)$ for cheating contributions.[7] With the Roy's identity conditions, we can also compute the welfare effect of changes in t and τ for each individual: $\nu^i_{1-t} = z^i \nu^i_R$ and $\nu^i_{1-\tau} = -(g + g^c)\nu^i_R$.

Concerning the government's program, we make two assumptions. First we assume that the government can contribute directly to the public good through direct provision financed by tax revenue.[8]. The total amount of public contribution to the public good is G^0. Following Saez (2004), we introduce the useful notations $\bar{G} = \bar{G}((1-t, 1-\tau, G^0, R)$, $\bar{G^c} = \bar{G^c}((1-t, 1-\tau, G^0, R)$and $\bar{Z} = \bar{Z}((1-t, 1-\tau, G^0, R)$ which denote average contribution, average cheating contribution and average earning for a given level of public provision of the public good. $\bar{G}_{G^0}$ is the crowding-out of public provision on private contributions. We make the assumption that there is no crowding-out on cheating contributions ($\bar{G^c}_{G^0} = 0$). Second, we make the assumption that the government can observe $\bar{G}$ at the aggregate level (for instance, through accounting of the nonprofit sector), it is only at the individual level that the government cannot disentangle true from cheating

7. We do not impose any restrictions on the utility function in this model. Note, however, that in the presence of complementarity between true and cheating contributions (g and g_c), any tax enforcement reform aimed at reducing cheating contributions may reduce true contributions as well, which would complicate the choice of the tax enforcement regime that is here taken as given.

8. In some cases, this assumption may not hold, as is the case for religious organizations in the United States for instance.

contributions. The government's program thus can be written as follows:

$$\begin{aligned}\text{Max}_{t,\tau,G^0} W &= \int \mu^i \nu^i(1-t, 1-\tau, G, R) \\ \text{s.t.} \quad t\bar{Z} &\geq R + \tau\bar{G} + \tau\bar{G}^c + G^0 \\ G^0 &\geq 0\end{aligned}$$

where μ^i is the social weight associated with individual i in the social welfare function. We denote by λ the Lagrange multiplier of the government budget constraint, which is therefore equal to the social marginal value of public funds. The first-order conditions of the government's program are:

$$\begin{cases} \int \mu^i[\nu^i_{1-t} + \nu^i_G \bar{G}_{1-t}]d\nu(i) + \lambda[-\bar{Z} + t\bar{Z}_{1-t} - \tau(\bar{G}_{1-t} + \bar{G}^c_{1-t})] = 0 \\ \int \mu^i[\nu^i_{1-\tau} + \nu^i_G \bar{G}_{1-\tau}]d\nu(i) + \lambda[t\bar{Z}_{1-\tau} + \bar{G} + \bar{G}^c - \tau(\bar{G}_{1-\tau} + \bar{G}^c_{1-\tau})] = 0 \\ \int \mu^i[\nu^i_R + \nu^i_G \bar{G}_R]d\nu(i) + \lambda[t\bar{Z}_R - 1 - \tau(\bar{G}_R + \bar{G}^c_R)] = 0 \\ \int \mu^i[\nu^i_G + \nu^i_G \bar{G}_{G^0}]d\nu(i) + \lambda[-1 + t\bar{Z}_{G^0} - \tau\bar{G}_{G^0}] = 0 \end{cases}$$

To derive our optimal subsidy formula, we make important additional assumptions. First, we assume that earnings are not affected by G and τ. This assumption is implicitly done in all empirical studies that attempt to measure the elasticity of reported contributions with respect to $1-\tau$. Indeed, it is very likely that people do not change their labor supply because of changes in the subsidy rate on charitable contributions. Still, for public goods such as poverty relief, it may be that increasing the level of the public good provided reduces the labor supply of low-income households. In the absence of clear-cut empirical evidence regarding these types of effects, it seems reasonable to assume zero effect.

Second, we assume that a compensated change on the tax rate on earnings has no effect on contributions. This assumption is also usually made in empirical studies on the elasticity of reported contributions. This means that a change in the tax rate on earnings only affects charitable contributions to the extent that it affects disposable earnings. Finally, we assume that there are no income effects on earnings at the individual level: $\partial z/\partial R = 0$. Since giving is highly concentrated among high-income households and given that most empirical studies find small-income effects relative to substitution effects for high-ability individuals, it is reasonable to assume that the labor supply of our population of interest is not affected by changes in the lump sum transfer R.

The derivation of our optimal subsidy formula can then be obtained by direct manipulation of the first-order conditions using the previous assumptions. Here, we give a more intuitive proof following the methodology of Roberts (1987) or Saez (2004). We suppose that the government increases the subsidy rate $d\tau > 0$ with an adjustment of public provision such that $d\bar{G} + dG^0 = 0$, thus leaving the size of the external effect unchanged. This change in the subsidy rate τ has four effects:

1. First, it has a mechanical effect on tax revenue: Increasing the subsidy rate on contributions reduces tax revenues by the amount of total private charitable contributions plus total cheating contributions.

$$A = -(\bar{G} + \bar{G^c})d\tau$$

2. There is also a welfare gain for individuals because of the increase in the subsidy rate. For each individual i, this effect can be written using Roy's identity conditions: $du^i = -\nu^i_{1-\tau}d\tau = +(g + g^c)\nu^i_R d\tau$ We introduce the useful notation $\beta(\bar{G^T}) = \int \frac{\mu^i(g+g^c)\nu^i_R}{\lambda(\bar{G}+\bar{G^c})} d\nu(i)$, which is the average social weight weighted by reported contributions. Integrating over i, we find the aggregate effect on individual's welfare:

$$B = \beta(\bar{G^T})(\bar{G} + \bar{G^c})d\tau$$

3. The third effect is due to behavioral responses on contributions. This generates a revenue loss of: $-\tau(d\bar{G} + d\bar{G}^c)$. The effect on private contributions can be rewritten using the price effect and the crowding-out effect: $d\bar{G} = -\bar{G}_{1-\tau}d\tau - \bar{G}_{G^0}dG^0 = \frac{-\bar{G}_{1-\tau}d\tau}{1+\bar{G}_{G^0}}$. Assuming no crowding-out on cheating contributions, we can also rewrite

$d\bar{G}^c = -\bar{G^c}_{1-\tau} d\tau$. The total effect of behavioral responses on contributions is thus:

$$C = \tau\left(\frac{\bar{G}_{1-\tau} d\tau}{1 + \bar{G}_{G^0}} + \bar{G^c}_{1-\tau} d\tau\right)$$

4. Finally, there is the cost of adjusting the public provision of the public good for the government. By definition, this cost is:

$$D = -dG^0 = d\bar{G}$$

At the optimum, the sum of these four effects must be zero. $A + B + C + D = 0$. With some manipulations, we therefore get that, at the optimum, the following equation must hold:

$$-\frac{\alpha}{1 + \bar{G_{G^0}}} \varepsilon_g + \frac{\tau(1-\alpha)}{1-\tau} \varepsilon_{g^c} = 1 - \beta(\bar{G^T}) \tag{2}$$

Or equivalently, we can rewrite equation 2 with the elasticity of total reported contributions (ε_{g^T}) to make it comparable with equation 1:

$$\varepsilon_{g^T} = (1 + \bar{G_{G^0}})[-(1 - \beta(\bar{G^T})) + (1-\alpha)(\frac{1}{1 + \bar{G_{G^0}}} + \frac{\tau}{1-\tau})\varepsilon_{g^c}] \tag{3}$$

In the absence of tax cheating, we get that, at the optimum, the following equation must hold:

$$\varepsilon_{g^T} = -(1 - \beta(\bar{G^T}))(1 + \bar{G_{G^0}}) \tag{4}$$

Equation 4, which is very similar to the formula derived by Saez (2004), shows that our model generalizes the unit elasticity rule in the absence of tax cheating: With Rawlsian redistributive tastes ($\beta(\bar{G^T}) = 0$) and no crowding-out ($\bar{G_{G^0}} = 0$), equation 4 states that at the optimum, we must have $\varepsilon_{g^T} = -1$. In the presence of crowding-out, the absolute value of the elasticity of reported contributions can nevertheless be less than unity.

Equation 3 generalizes the insight of the simple public finance formula (1) presented in the previous section. In the presence of tax cheating, and with no redistributive tastes and no crowding-out, the absolute value of the elasticity of reported contributions must be larger than one at the optimum. Two additional statistics need to be estimated to assess the opportunity of increasing the subsidy rate: α, the share of true contributions in total reported contributions and ε_{g^c} the elasticity of cheating contributions with respect to $1-\tau$. Note also that equation 2 can be compared with the sufficient statistics formula derived by Chetty (2009a) in the case of taxable income elasticity with tax sheltering: Taxable income elasticity is no longer sufficient to estimate deadweight loss in this case, and the size of the welfare loss is given by a weighted average of the elasticity of taxable income and of the elasticity of total earnings.

We interpret our results in light of the welfare-sufficient statistics literature by noting that three sufficient statistics must be estimated to assess the subsidy rate optimality for a given level of tax enforcement. These statistics are the elasticity of reported contributions, the share of "cheating" contributions in total reported contributions, and the elasticity of cheating contributions with respect to $1 - \tau$. In the remainder of the paper, we empirically estimate these parameters. Compared with structural approaches, this has two advantages: It allows for fairly general models, such as the welfare model presented here, and it limits the number of parameters to be identified, especially in the case of cheating, whereby identification opportunities are scarce. Of course, the full structural primitives of the model are interesting per se, as for instance the behavioral nonstandard aspects (warm-glow parameters). But to be able to estimate these parameters, it is necessary to impose much more structure on the model. Moreover, estimation of a full structural model in the field of charitable giving is best-suited to randomized experiments in which one can control identification sources, as in DellaVigna *et al.* (2009). Here, to the contrary, we claim that important welfare recommendations can be derived by pinning down only three parameters that can be estimated in non-randomized experimental settings. Of course, this is conditional on a certain number of assumptions usually made in the sufficient statistics literature. We rely noticeably on the assumption that the elasticities are somehow immutable parameters, or at least, that they do not vary with small changes of τ. For a discussion of the pros and cons of the welfare-sufficient statistics approach, a thorough analysis is given by Chetty (2009b).

In the remainder of the paper, we provide substantial evidence that ignoring cheating parameters is likely to lead to large deviations from the optimal subsidy because, first, the share of cheating contributions is important in most tax systems (and especially in the U.S. tax system) and, second, the price elasticity of cheating contributions is large, especially when receipts are not required to be attached to the tax return (as is still the case for most contributions in the U.S.).

3 Estimation of cheating parameters

In this section, we focus on the estimation of the two cheating parameters of interest to assess the optimality of tax subsidies for charitable contributions: the share of cheating contributions in total reported contributions and the price elasticity of cheating contributions.

Several approaches have been taken in prior empirical literature to measure tax evasion. The first approach relies on audited returns. A number of studies therefore utilize cross-sectional variation across taxpayers in observed levels of compliance using the Taxpayer Compliance Monitoring Project (TCMP), which describes the outcome of IRS audits of randomly chosen tax returns. Clotfelter (1983), using TCMP microdata, finds that noncompliance is strongly positively related to the marginal tax rate, whereas Feinstein (1991) finds a negative impact. Slemrod (1989) uses TCMP data to investigate specifically the extent of tax evasion through charitable deduction. As with any cross-sectional study of the impact of taxes on behavior, this type of approach is made difficult by the fact that the marginal tax rate is a function of income, making it difficult to identify the tax rate and income effects separately without making strong functional form assumptions. Moreover, the use of audited returns raises specific issues. If audited returns come from selected samples of audited taxpayers, then selection becomes a problem. If on the other hand, audited returns come from random audits, the overall level of evasion is difficult to infer because of the likely strong concentration of cheating behaviors across taxpayers. A second approach taken in the literature uses experimental methods to investigate tax compliance and its response to tax rates and enforcement. Blumenthal *et al.* (1998) analyze the results of a randomized controlled experiment conducted by the State of Minnesota Department of Revenue. Kleven *et al.* (2009a) use a randomized experiment in Denmark and find a high level of compliance. Their results also suggest that the informational framework may be even more important than socioeconomic variables in explaining tax compliance. The third type of approach is indirect and involves observing quantities, such as national income and product accounts from external sources and inferring evasion from these quantities [9]. The main drawback of this type of approach is that external surveys may lack reliability, and the gap between tax data and survey data is usually very noisy. In a similar vein, a number of studies have focused on indirect sources of identification of evasion [10].

Here, we rely on another type of approach by exploiting natural experiments on tax enforcement with tax data. We use two important policy changes that significantly altered the cost of cheating contributions for taxpayers, and our results reveal the existence of significant cheating occurring through charitable deduction. First, we focus on the 1969 tax reform. The Tax Reform Act of 1969 (TRA69) tightened significantly the rules applying to the functioning of private foundations in order to prevent financial abuses in charitable contributions to private foundations that had been abundantly reported during the 1950s and 1960s. Second, we study the effect of a tax enforcement reform in France in 1983 by which the French tax administration asked taxpayers to attach receipts to their

9. Gorodnichenko *et al.* (2009), for instance, rely on the gap between consumption in household expenditure surveys and reported earnings before and after a flat tax reform in Russia.

10. Fisman & Wei (2004) examine the misclassification of Chinese imports from Hong Kong. They find that the gap at the detailed good level between reported Chinese imports from Hong Kong and reported exports from Hong Kong to China is largest for goods with high tax and tariff rates. Hsieh & Moretti (2006) uncover evidence of underpricing and bribes in Iraq's Oil-for-food program by comparing prices charged by Iraq for oil with prices of close substitutes sold on the world market.

tax form in order to legitimately claim the tax deduction for charitable contributions.

The approach most closely related to ours is that of Marion & Muehlegger (2008), who examine the effects of a federal regulatory innovation in October 1993, the addition of red dye to untaxed diesel fuel at the point of distribution that significantly lowered the cost of regulatory enforcement.

3.1 United States, 1969: Tightening of the rules regulating private foundations

The first natural experiment that we focus on took place in the United States in 1969 and significantly modified the tax enforcement of contributions to private foundations.

Reported charitable contributions of the top .01% of U.S. taxpayers experienced a tremendous surge during the 1940s and 1950s [11]. At that time, marginal tax rates for these taxpayers reached an historical peak, with rates as high as 90%. These very high marginal tax rates constituted a major incentive to donate to charitable causes. But these very high tax rates also constituted a significant incentive to engage in tax avoidance behaviors. Indeed, during the 1940s and 1950s, the number of private foundations' created surged. Foundations experienced very lax control before 1969, and apart from their tax-exempt status, the rules regulating their functioning were nearly nonexistent. Moreover, the audit rates of foundations by the IRS were very low. [12] Therefore, family charitable trusts and private foundations constituted a highly practical vehicle for tax sheltering. [13] Soon, a large number of abuses were reported.

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11. We created long term series on charitable contributions and effective marginal tax rates of top income groups since 1917. Series are available at: www.stanford.edu/ landais/

12. Cf. Peterson (1970).

13. It is interesting to note that tax evasion motives have always played a key role in the history of *trusts*. For instance, *trusts* have historically developed for tax evasion reasons in feudal England, as mentioned by North *et al.* (2009). Land trusts were a way of evading the feudal obligations (military service and taxes) linked to land holding by transferring the title of land ownership to a third party (the trustee).

These abuses are in fact well-documented thanks to a series of reports commissioned by different committees appointed by the U.S. Congress or by the U.S. Department of the Treasury. The Cox Committee Report (1952), the Reece Report (1954), the U.S. Treasury Department report (1965), and the Peterson Report (1970) all provide numerous detailed accounts of frauds and abuses. Overall, the most common fraudulent practices included:

- "Self dealing": prior to TRA69, the tax law permitted transactions between a donor or those related to him and his private foundation if they were at *reasonable* or *arm's length* terms. This permitted a variety of doubtful transactions to occur [14].
- Overvaluation of property contributed to one's own private foundation to increase the amount of one's tax deduction [15].
- Falsely claimed deductions.
- Foundations set up to maintain ownership of a business while benefiting from tax exemption of income generated.
- Political briberies: a famous example involved the Wolfson Foundation that made a long-term agreement for sizable annual payments to Associate Justice Abe Fortas of the U.S. Supreme Court.

Overall, this resulted in extremely low payout rates for a significant number of private foundations that functioned, for many of them, as pure tax shelters. Because of growing public concerns, in 1969, the U.S. Congress passed a tax reform act, TRA69, to better regulate the use of private foundations by high-income taxpayers. The provisions of the new tax law included:

- Prohibition of "self dealing", defined as activities that benefit foundation managers, officers, substantial contributors, and other foundation insiders.
- Stricter tax rules on unrelated business income (UBI). In particular, business income that was not related to the charitable activities of the organization became subject

14. An anonymous survey of accountants of nearly 500 foundations by Arthur Andersen on behalf of the Peterson Commission reported that 9% of accountants acknowledged common financial self dealing practices within private foundations and that 8% acknowledged that the grants distributed by the foundation were made based on friendship.

15. These types of overvaluation were especially numerous with property for which there was no ascertainable market price

to tax.

– Establishment of a minimum payout rate as a percentage of investment assets. It was to be the greater of the foundation's actual investment income and a predetermined rate, originally set at 6% [16].

– Creation of an excise tax on the investment income of private foundations, with an original rate of 4% [17]

– Further, while the income ceiling of deductions for public charitable foundations was increased from 30% to 50%, it stayed at 20% for private non-operating foundations, with no possibility for carryover.

TRA69 therefore represents an interesting natural experiment on tax enforcement. First, it substantially increased the cost of tax avoiding contributions that became much more difficult to carry on. In addition, the IRS committed to significantly increase the audit rates on foundations. Second, it is important to note that the reform did not affect the price of "true" contributions. The mandatory payout rate was set at a very low level in order to not penalize properly operating foundations, and almost no donors hit the ceiling of 20% prior to the reform. Therefore the reform is expected to have reduced "cheating contributions", without affecting "true" contributions. But of course, TRA69 is not expected to have completely shut down cheating contributions after 1969 for rich taxpayers, so it gives us the opportunity to estimate a lower bound on the share of contributions that were "cheated" $(1 - \alpha)$.

Data & strategy

The effects of TRA69 are visible in figure 1, which displays the number of foundations created and terminated from 1960 to 1972. While the number of new foundations was stable around 1,300 every year before 1969, it suddenly dropped to fewer than 300 after 1969. In the meantime, the number of foundations terminated surged. This evidence

16. Foundations that failed to meet these requirements were subject to an additional tax.

17. Note that such a tax is not likely to significantly affect charitable contributions because it represents only a negligible change in the price of giving: the compounded value C of a contribution g until time t at interest rate r without the excise tax is $(1+\tau)g \cdot e^{rt}$ and with the excise tax it is $(1+\tau)g \cdot e^{(1-\tau_2)rt}$, where τ is the marginal income tax rate and τ_2 is the excise tax on investment income. Over 10 years, at 4% interest rate, the excise tax only leads to a 1.6% reduction in C.

confirms that before 1969, a significant number of foundations had been created for tax sheltering purposes. To identify the effect of TRA69 on private contributions, we use data from IRS microfiles, with oversampling of high-income taxpayers spanning 1960 to 1990. These samples are repeated cross-sections drawn from individuals' tax returns and contain detailed information on sources of income and deductions claimed.[18] The identification strategy relies on the fact that only a small fraction of taxpayers have their own private foundations. As shown in figure 2, households with income below the 99th percentile do not have private foundations. It is only among the top .01% of taxpayers that private foundations are a common practice. Substantial evidence also confirms that among these high-income taxpayers (top .01%), the majority of reported charitable contributions are made through family trusts and foundations.[19] We therefore use a standard difference-in-difference strategy and look at the effect of the reform on contributions reported by the top .01% of taxpayers relative to contributions of other top income groups not rich enough to set up their own private foundations. Figure 3 gives graphical evidence of the reform's impact following our identification strategy: It displays the evolution of total reported charitable contributions for the top .01% of taxpayers (treated group) and for two income groups unaffected by the reform (control), the top 6% to top 2% of taxpayers (P96-98) and the top 10% to top 5% of taxpayers (P90-95). While the aggregate levels of reported contributions for these three groups exhibit parallel trends during the 1960s, a substantial drop in total contributions appears following TRA69 for the top .01% of taxpayers relative to the two unaffected groups, which continue to exhibit the same parallel trends as before TRA69.

18. For 1960 to 1972, information on charitable contributions is only present once every two years (in 1960, 1962, 1964, etc.).Unfortunately, it is not possible to disentangle contributions by recipient type in these microfiles.

19. A survey conducted in 1970 by the University of Michigan on behalf of the Commission on Private Philanthropy and Public Needs using data from the IRS indicated that nearly 70% of contributions from taxpayers with income above $1,000,000 were dedicated to a remainder category mainly including contributions to foundations. This evidence is also confirmed by recent surveys conducted by the Center on Philanthropy at Indiana University for the Bank of America on high-net-worth households(see Center on Philanthropy (2009)). These surveys demonstrate that most contributions by the very wealthy are donated to their own giving vehicle (trust or private foundation). Interestingly, when asked why they chose to establish a private foundation, the top two answers given by wealthy households in 2008 is "*to maximize charitable deductions*" (59%) and "*to avoid capital gain taxation*" (35.7%).

Since all relevant information concerning treatment and control in this natural experimental setting comes at the income group level, we collapsed our observations at the income group level to avoid inference issues due to potential correlation of errors within income groups (as is well-known since Moulton (1990)). Our standard difference-in-difference specification to estimate the impact of TRA69 on cheating contributions can thus be summarized as follows:

$$log(contribution)_{i,t} = \sum_i \delta_i + \sum_t \theta_t - (1-\alpha) * (\text{Treated group} * \text{after 69}) + X_{i,t}\beta + \varepsilon_{i,t} \quad (5)$$

where δ_i are income groups' fixed effects, θ_t are year fixed effects, and $X_{i,t}$ is a vector of controls including percentage of married couples, log of average disposable income, and log of average price to control for possible small variations of price or income across groups. The coefficient before (Treated group $*$ after 69) gives us the percentage drop in total reported contributions for the treatment group that we interpret as $-(1-\alpha)$, the share of contributions that was cheated by the treatment group. Of course, some cheating may still be occurring, even after the 1969 reform, among the treatment group. Our estimates must therefore be interpreted as a lower bound on $1-\alpha$ for very rich taxpayers.

The baseline specification compares group P99.99-100 (top .01% of taxpayers) versus group P90-95 (top 10% to top 5% of taxpayers) for the time window 1960 to 1980.[20] We compare 1960 to 1968 with 1970 to 1980.[21] Concerning the timing of the reform, even though some elements of the reform were discussed publicly as early as 1965,[22] it is unlikely that the wealthiest taxpayers had the opportunity to fully anticipate TRA69, because Congressmen moved more quickly than anticipated, and TRA69 was signed by President Nixon on December 30, 1969 before the Peterson Commission had time to

20. We also considered a narrower time window (1964 to 1975) in our sensitivity analysis without any loss of robustness.

21. Note that, unfortunately, information on charitable deductions is not present in the 1969 sample from the IRS.

22. The U.S. Treasury Report on Private Foundations of 1965 had already asked for the U. S. government to intervene in the actions of foundations and force them to become more accountable through a series of tax laws that would assure the tax-exempt status of foundations would no longer be abused. The recommendations published in the U.S. Department of the Treasury's report included many of the main provisions of TRA69.

release its final report (August 1970).

Results

Results are presented in table 1. To control for inference issues arising in difference-in-difference estimates from potential serial correlation of errors by income group (Bertrand *et al.* (2004)), cluster-robust standard errors are displayed (with clustering at the income group level). Our baseline estimates (column (2)) state that contributions by the top .01% of taxpayers dropped by 28% following TRA69, relative to contributions of income groups not affected by the reform. This suggests that a substantial share of contributions by the very wealthy had been motivated by tax avoidance purposes.

We also present in table 1 results controlling for potential bias arising in diff-in-diff analysis due to preexisting trends, as highlighted, for instance, in Wolfers (2006). We first regress our dependent variable (log of contributions) for years prior to the 1969 reform on the same set of regressors, and we include differential time trends across groups.

$$log(contribution)_{i,t} = \sum_i \delta_i + \sum_t \theta_t + \sum_i \eta_i(\delta_i * t) + X_{i,t}\beta + \varepsilon_{i,t}$$

Then we regress the difference between actual contributions and fitted values of the preceding model for years after the reform on a set of year dummies and an indicator for treatment:

$$log(contribution)_{i,t} - log(\widehat{contribution})_{i,t} = \sum_t \theta_t - (1-\alpha) * (\text{Treated}) + \varepsilon_{i,t}$$

Results are presented in column (4) and confirm that the inclusion of controls for pre-existing trends does not affect the robustness of the previous estimates. We conducted the same procedure without year 1968 to control for possible shifting behaviors in anticipation of TRA69, and we also conducted the procedure with second-order polynomial trends with no loss of robustness.

The last two columns of table 1 present results from placebo regressions, in order to ensure that the estimates are not purely spurious correlations. The first placebo regression consists in comparing two control groups, artificially attributing treatment to group P90-95 after 1969. The second placebo regression consists in comparing the treatment group and the baseline control group before the reform, artificially attributing treatment years to 1965 to 1968. In these two cases, columns (5) and (6) demonstrate that the coefficient on the interaction term *(treated*after reform)* is not significantly different from 0.

Results therefore suggest that a very significant fraction (around 25% to 30%) of contributions reported by the very wealthy before 1969 were driven by tax avoidance or tax cheating purposes. These results have interesting implications for policies regarding tax expenditures. They tend to confirm that higher marginal tax rates reduce importantly voluntary compliance, as noted in some previous studies about evasion (such as, for instance, Clotfelter (1983) or Poterba (1987)). When marginal tax rates reach very high levels, as was observed from the 1940s to 1960s, tax expenditures are widely utilized as channels of evasion, and tax enforcement likely needs to be increased. Our results using TRA69 as a natural experiment on tax enforcement give a good sense of how significant avoidance strategies can be when marginal tax rates increase.[23] Nevertheless, because of the setting of this natural experiment, only "treatment on the treated" effect can be estimated, and we cannot investigate heterogeneity issues. We have reasons to believe, though, that the propensity to cheat is not likely to be the same across taxpayers, either for idiosyncratic reasons or because of differential incentives to cheat. In particular, the share of contributions that is cheated is clearly a function of marginal tax rates, but in our setting, we are compelled to estimate the share of cheating contributions taking marginal tax rates as given. The inability to estimate the elasticity of cheating contributions with respect to marginal tax rates in the TRA69 case is due to the lack of marginal tax rate variations among the treatment group (top .01%) in which every taxpayer hits the top

23. It is worth mentioning, however, that even though top marginal tax rates have substantially decreased and tax enforcement on contributions has been tightened, tax avoidance and evasion through charitable contributions may still be important among the wealthiest taxpayers, as highlighted by Yermack (2008).

marginal tax rate of the tax schedule. To the contrary, the French natural experiment that we study in the next section offers treatment heterogeneity and enables us to estimate both parameters of interest: α and ε_{g_c}.

3.2 France, 1983: Requirement to attach receipts

The French tax enforcement reform that took place in 1983 is interesting in the U.S. context because the reporting system in France before 1983 is very similar to the actual reporting system for charitable contributions in the Federal Income tax system. Before 1983, French taxpayers were only asked to keep a receipt of every contribution they claimed on their tax return, just as U.S. taxpayers have been asked to do since 2006, for cash contributions in excess of $250 and for all non-cash contributions. Since the beginning of the 1970s, the French tax administration had produced standard forms to be used by charities as receipts that they had to give to every one of their donors. From 1983 on, the French tax administration has required that taxpayers attach these receipts to their tax return when claiming the charitable deduction (instead of just keeping the receipt at home in case of an audit). Figure 4 displays the evolution of total reported contributions before and after the 1983 reform in France. The total level of contributions as a percentage of total income dropped by 75% between 1982 and 1983. We also display on figure 4 evidence that contributions effectively received by French charities did not drop at all, so that the drop is clearly attributable to variation in reporting behaviors. We had access to the Annual Financial Reports of "la Fondation de France" between 1977 and 1993, which is the oldest and largest foundation operating in France, and also the only foundation to have well-established and consistent financial information available since the 1970s (see Pavillon (1995) . We plotted the evolution of total contributions received by "la Fondation de France", and there is absolutely no evidence of a decline in contributions received. To the contrary, contributions in real terms continued to grow steadily from 1977 to the beginning of the 1990s. Even though the reform might have increased underreporting of contributions in tax declarations, it seems very unlikely that such a discrepancy between the two series could be explained by underrporting (we further discuss this point later in the paper). Figure 4 demonstrates that tax enforcement regimes are first-order phenomenon to understand the relevance of tax policy for charitable contributions. In this subsection, we take advantage of the French 1983 tax enforcement reform to estimate the two cheating parameters: α and ε_{g^c}

Data & strategy

We use data from two samples of 50,000 taxpayers in 1979 and 1984, drawn by the French tax administration with oversampling of rich taxpayers. These samples gather information drawn from individuals' tax returns and contain detailed information on sources of income, deductions claimed, income taxes paid, transfers received, plus standard information on marital status and number of children. For 1984, we have information on reported contributions and on receipts sent. We always make use of reported contributions to compute our estimates (and not contributions with proven receipts in 1984).

The advantage of the French reform is that all taxpayers are affected. Given that the French tax incentive system was, at that time, a deduction from taxable income, there is heterogeneity in treatment due to taxpayers having different marginal tax rates. This affords us the opportunity to estimate both cheating parameters of interest: α and ε_{g_c}. We begin by estimating α and then we turn to the estimation of ε_{g_c} that we pin-down by estimating the variation in price elasticity of contributions between 1979 and 1984. We control for endogeneity of marginal tax rate variations in the cross-section by taking advantage of nonlinearities brought about by the functioning of a system of family income splitting in France. [24]

24. The functioning of the family income splitting is explained further below.

Estimation of α

To estimate α, the share of true contributions in total reported contributions, we rely on the assumption that, absent the reform and conditional on observables, contributions should not have changed before and after the reform. The identification is thus essentially time-series and the specification to estimate α is then straightforward:

$$log(contributions) = \gamma log(1-\tau) + \theta log(income) + X'\beta - (1-\alpha)(\text{Year=1984}) + u$$

The coefficient on the dummy variable $Year = 1984$ gives us the total drop in contributions in 1984 relative to 1979, which is equal to $-(1-\alpha)$. Results are displayed in table 2. As suggested by figure 4, we find a drop in contributions of around 75% in 1984 relative to 1979. This drop is even more severe when we focus on taxable households. Overall, our baseline estimates suggest that $\hat{\alpha} \simeq .25$

This estimation procedure raises some possible caveats, essentially because it tends to attribute the entire drop in contributions to cheating behaviors. Other explanations may be invoked. First, reporting contributions may be more costly after the reform because of the time of attaching the receipt, therefore leading to an overestimation of the drop in contributions due to cheating behaviors. Second, people may simply not receive, or may even lose, their receipts. Overall, this raises the concern that true contributions may be underreported after the reform. Three things may alleviate this concern. To begin with, the technology for sending receipts had already existed before the reform, so that the tax enforcement reform did not unduly burden charities with any important additional technological costs of providing the receipts. And for individuals, the reform meant merely attaching the receipt when filing their tax form. More important, external survey evidence demonstrates that most people very accurately report their contributions subsequent to the reform. A survey conducted by Cerphi-Gregor in 2007 on a sample of 2,047 contributors shows that 81% of households accurately report their gifts. It is therefore very unlikely that the bias due to underreporting of true contributions after the reform could explain the whole drop in contributions. In 2007, the level of contributions as a fraction of total income had not yet reached half the level it had in 1982 just prior to the reform, despite a tremendous increase in the tax incentives to give since 1996. Finally, if underreporting was the main explanation for the drop in reported contributions, then we should see that individuals with higher marginal tax rates, and therefore higher incentives to report, tend to report more after the reform relative to individuals with lower marginal tax rates. The price elasticity of reported contributions should therefore go up after the reform. But we observe precisely the contrary, which suggests that "cheating" is the main explanation for the drop in contributions. Overall, we are mainly interested in showing that "cheating" is a first-order phenomenon in enforcement regimes where receipts are not attached to tax returns and our estimates can be interpreted an upper bound on $1-\alpha$.

Estimation of ε_{g_c}

Contrary to the 1969 tax reform in the United States, which affected only top income households, the French reform affected all taxpayers. This gives us the opportunity to compare the elasticity of reported contributions before and after the reform, and eventually to back out the price elasticity of "cheating" contributions.

The strategy to estimate ε_{g_c} is two-pronged. We begin by estimating the regime change in price elasticity of contributions induced by the 1983 reform. Figure 5 provides a first unconditional picture of the change in price elasticity between 1979 and 1984. Each black scatter stands for a percentile of the income distribution in 1979 and plots the average log of contributions against the average log of price. Each grey scatter stands for a percentile of the income distribution in 1984. Because of the log-log specification of the graph, the slope of each regression line can be interpreted as the price elasticity of contributions in 1979 and in 1984. Of course, this unconditional picture does not control for the fact that a large fraction of the variation in price comes from variations in income (households with higher income facing higher marginal tax rates, and thus lower prices).

Since income is a major determinant of charitable behavior as well as of cheating behaviors, it is necessary to control carefully for the endogeneity of the variations of price in the cross-section.

To do so, we take advantage of the existence of a system of family income splitting in France, called *Quotient Familial* (QF). The principle is as follows. Total income tax is computed as $Tax = nT(\frac{Y}{n})$, where Y is the taxable income of the household, n is the number of QF units (which is a function of marital status and of the number of children in the household) and $T(.)$ is the tax schedule with $T' \geq 0$ and $T'' \geq 0$. The marginal tax rate faced by the household is then $\tau = \frac{d\text{Tax}}{dY} = T'(Y/n)$. At any given level of income, τ varies with n the number of QF units and an increment in income will lead to different variations in τ for different levels of n. This creates important nonlinearities in marginal tax rates as a function of income and family size that are summarized in figure 6. We exploit these nonlinearities to identify the causal effect of marginal tax rates on reported contributions. We therefore introduce 20 income group dummies to control nonparametrically for income, and a full set of marital status and number of children dummies and we only exploit variation in price that come from the functioning of the family income splitting system. In other words, our identification uses the fact that for each pair of income groups, there are differential non linear changes in price across households with different number of QF units. We add nonparametric controls for age, and a set of marital and children dummies interacted with log(income). We therefore not only fully control for differences in giving behaviors across groups of income and across households with different family size, but also for potential differences in the income elasticity of charitable giving across households with different family size. Our specification estimates jointly the price elasticity in 1979 and in 1984 by pooling all observations together. We therefore interact all our controls with year fixed effects so that all the right-hand side variables are year-specific. The price of giving is finally correlated with the level of contributions and potentially with the use of various deductions that may reduce taxable income and that are also usually correlated with the use of the charitable deduction. To control for such endogeneity issues, we first use the log price of giving ($log(1 - \tau)$) that each taxpayer would face for the first euro of contribution and instrument $log(1 - \tau)$ by a set of dummies for all n QF groups interacted with a set of 20 reported income group dummies, where reported income is computed not taking into account any deduction, exemption or adjustment. Doing so, we therefore make sure that we only exploit variations in price that come from the functioning of the family income splitting system.

Figure 7 gives a graphical idea of our identification technique. In this figure, we focus on two groups: taxpayers with 1 unit of QF and taxpayers with 4 units of QF. In addition to the evolution of the log of price against the log of income that we have displayed in figure 6, figure 7 also displays the evolution of the log of contributions against log of income. The figure confirms that the relative evolution of the log of contributions between the two groups follows closely the relative evolution of the log of price. For taxpayers with log of income inferior to 8, the log of price is zero for both groups, and reported contributions are almost zero for both groups. Then, for taxpayers with log of income between 8 and 9.5, contributions begin to rise as the log of price drops sharply for taxpayers with 1 unit of QF, whereas contributions and price remain equal to zero for taxpayers with 4 units of QF. Then, for taxpayers with log of income between 9.5 and 10, the price drops sharply for taxpayers with 4 units of QF whose contributions suddenly bridge their gap with contributions of taxpayers with 1 unit of QF whose price stays constant in this income range.

Results are displayed in table 3. Our estimates confirm that the price elasticity of contributions significantly dropped after the 1983 reform. Estimates of the price elasticity for 1979 are around -1.6 and around -.8 for 1984. These estimates are robust across a large number of specifications. We display, for instance, in table 3 estimates with a smaller number of income group fixed effects. Estimates are also stable when we allow the income elasticity to vary across family groups by interacting log of income with the marital and number of children fixed effects (column 4).

Concerns may arise that our baseline estimates are biased because of censoring or excess-zero responses, due to the large number of taxpayers not reporting any positive contributions [25]. To tackle this issue, we implement 3-step IV-censored quantile regressions *a la* Chernozhukov *et al.* (2010) that address the problem of censoring with minimal functional form assumptions and deal with endogeneity of regressors via a standard control function approach. This strategy has several advantages over the Tobit model. First, it is distribution-free and allows for heteroscedasticity. The basic intuition is that the conditional quantile of the distribution of gifts is unaffected by the censoring mechanism. This is the reason why we can obtain a consistent estimation without specifying a complete parametric distribution of the error term, which is impossible when one relies on the conditional mean of the distribution (as is the case in the Tobit model). Second, quantile regression allows for the investigation of heteregeneous effects over the distribution of contributions. Results are displayed in table 4 and show that the change in price elasticity is more pronounced at both ends of the distribution of contributions. This suggests that cheating is more elastic to price for both very small gifts and very large gifts than for median contributions. We also display in table 4 results restricting the sample to low income households (first half of the income distribution) and top income households (second half of the income distribution). Interestingly, it seems that the drop in the price elasticity of contributions is more pronounced for low income households, which suggests that for that given tax enforcement regime, this type of "low cost" tax cheating, where one just increases her true level of contributions by a few extra dollars when filing her tax return, is relatively more attractive for low income households, compared to more sophisticated tax cheating/avoidance behaviors which are more often used by higher income households [26].

To back out ε_{g_c} from our previous estimation, we rely on the assumption that after

25. We followed the convention of giving an extra euro of contribution to all households so that log(contributions) is defined for all observations. We have checked that this parametrization does not affect our results by trying different specifications where we give 10 extra euros instead of one, or by setting the level of censoring at 10 euros in IVCQREG specifications.

26. Note also that these results might reflect differential audit rates by income level.

1984, cheating contributions are equal to zero. In France, room for abuses is small. Gifts of assets or cars are not allowed, private foundations are subject to close State scrutiny and their number is very limited. There is thus strong reason to believe that the technology for reporting charitable contributions implemented after the 1983 reform has brought the level of cheating contributions close to zero. Given that assumption, we can pin down ε_{g_c} from our price elasticity estimates in 1979 and 1984. For 1979, total reported contributions are a mix of true and cheating contributions: $g_T = g + g_c$. Therefore:

$$\frac{dg_T}{g_T} = (\alpha\varepsilon_g + (1-\alpha)\varepsilon_{g_c})\frac{d(1-\tau)}{1-\tau}$$

We thus have estimated:

$$log(contributions) = (\alpha\varepsilon_g + (1-\alpha)\varepsilon_{g_c})log(1-\tau) + X'\beta_1 + u \qquad (6)$$

and the coefficient that we obtained for $log(1-\tau)$ is a weighted average of the elasticity of true contributions and of the elasticity of cheating contributions. In 1984, under our assumption that cheating contributions are equal to zero, we now have that $g_T = g$ and therefore

$$\frac{dg_T}{g_T} = \varepsilon_g \frac{d(1-\tau)}{1-\tau}$$

We have estimated:

$$log(contributions) = \varepsilon_g log(1-\tau) + X'\beta_2 + u \qquad (7)$$

and we therefore have an estimate of ε_g.

From our baseline estimates, we get that $\hat{\alpha} = .25$, $\hat{\varepsilon}_{g1979} = -1.5$ and $\hat{\varepsilon}_{g1984} = -.85$. To pin down ε_{g_c}, we use the fact that:

$$\hat{\varepsilon}_{g_c} = \frac{\hat{\varepsilon}_{g1979} - \hat{\alpha}\hat{\varepsilon}_{g1984}}{1-\hat{\alpha}}$$

This yields with a simple plug-in (confidence interval on $\hat{\varepsilon}_{g_c}$ can be computed using the delta method):

$$\hat{\varepsilon}_{g_c} \simeq -1.7$$

Our estimate suggests that the elasticity of cheating contributions with respect to price is large, and greater than one in absolute value. In the French case, this means that the simple modified public finance criterion (1) did not hold prior to the reform whereas the *unit elasticity rule* was satisfied:

$$|\hat{\varepsilon}_{g_T}| < 1 + \frac{1-\hat{\alpha}}{1-\tau}|\hat{\varepsilon}_{g_c}|$$

Once again, concern may arise that after 1983, people may report only part of their gift, meaning that $g_T = g - g_o$, with g_o being nonreported contributions. To understand whether this may affect our estimates of the regime change in price elasticity, it is useful to distinguish two cases. The first case is that g_o does not depend directly on marginal tax rates. In this case, this should not affect our estimates, given that we rely on exogenous variations of marginal tax rates. The second case is that g_o varies with the marginal tax rate. In this case, g_o is expected to vary negatively with the marginal tax rate, because the higher the marginal tax rate, the greater the incentive to report one's contributions. In this case, it is straightforward that the absolute value of the elasticity of reported contributions that we estimate in 1984 is a higher bound on the true elasticity. Therefore, we may even have underestimated the regime change in price elasticity, meaning that the absolute value of the elasticity of cheating contributions may be greater than our estimate.

Our results suggest that the price elasticity of "cheating" contributions is considerably larger than the price elasticity of true contributions. Considering only the elasticity of reported contributions to infer the optimal level of the tax subsidy for charitable contributions leads to a sizeable deviation from optimum in enforcement regimes where receipts are not attached to tax returns. Of course, the price elasticity of "cheating" contributions has many reasons to differ across tax enforcements regimes and the external validity of these estimates can be questioned. Nevertheless they are definitely interesting and particularly informative about the price elasticity of cheating contributions in the U.S. because the tax enforcement regime of charitable deductions in France before 1983 is almost similar to the enforcement regime of the vast majority of contributions in the Federal Income Tax system. Our results therefore unambiguously suggest that "cheating" is a first-order phenomenon for determining the optimal level of the charitable deduction in the U.S. tax system.

Conclusion

This paper demonstrates that tax cheating is a first-order concern to evaluate the optimal tax subsidy for charitable contributions. First, we derive a general framework to define the optimality of tax subsidies for contributions in the presence of tax cheating. Our results show that three welfare-sufficient statistics need to be estimated: the price elasticity of reported contributions, the share of "cheating" contributions in total reported contributions, and the price elasticity of "cheating" contributions. Then we estimate the two cheating statistics in two different contexts using two natural experiments on tax enforcement in both the United States and in France. Our results demonstrate that significant cheating behaviors take place through the charitable deduction channel. We also demonstrate that the price elasticity of cheating contributions is large in the absence of true third-party reporting of contributions as is the case in the U.S. where receipts are not required to be attached to the tax return for the vast majority of charitable contributions.

These results have important policy implications. First, tax cheating can no longer be neglected in assessing the optimal policy for charitable contributions. Second, the subsidy rate may not be the only relevant policy instrument, contrary to the proposal made by the Obama administration that tends to focus on capping the subsidy rate. Indeed, despite the 2005 reform of filing requirements of charitable contributions,[27] tax enforcement of

27. From 2006 on, contributions must fulfill the following requirements: For cash contributions in excess of $250, the taxpayer must keep a receipt; for noncash contributions of more than $500, the taxpayer must fill out qnd file IRS Form 8283. This new regime is still a lot laxer than the French regime

private contributions is still considerably lax in the United States compared with other countries, such as France, that switched to a system very close to third-party reporting of contributions. In this context, cheating contributions are likely to remain significant, and third-party reporting might prove more efficient than capping the subsidy rate.

before 1983, especially concerning small contributions. Note that the first figures available from the IRS Statistics of Income indicate that the total itemized contributions dropped significantly from 2.45% of total AGI in 2005 to only 2.2% of total AGI in 2007 after the introduction of the relatively mild tax enforcement reform of 2006.

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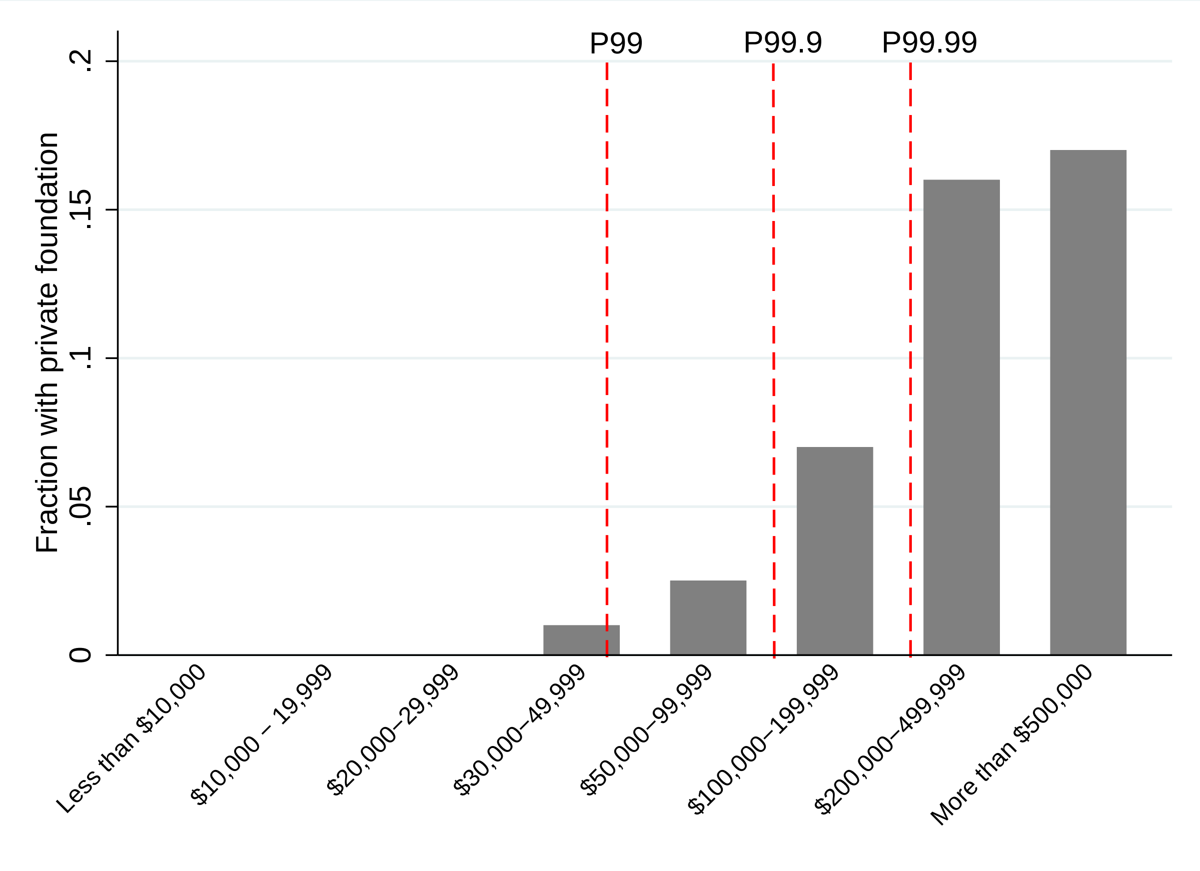
Figure 1: *Number of new foundations created and foundations terminated, United States (1960 to 1972)*

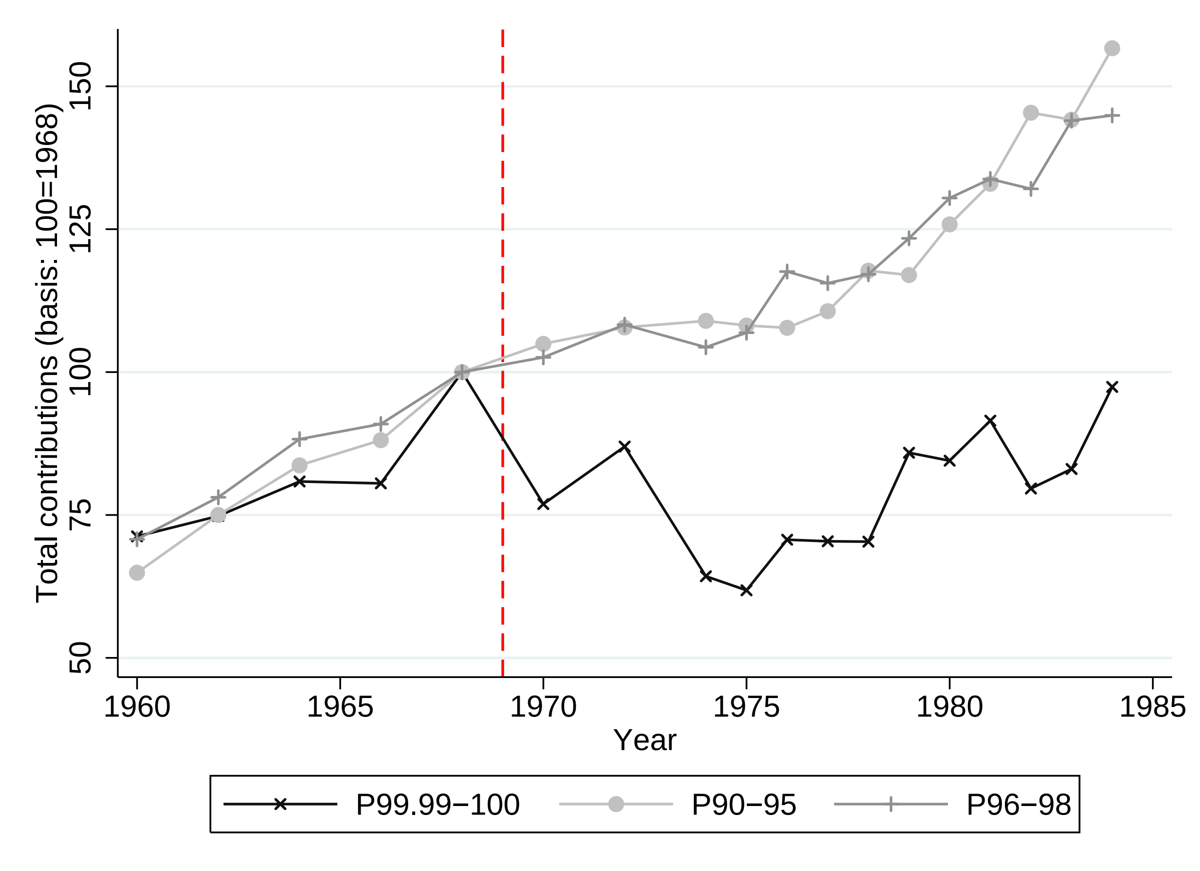
Source: Caplin and Drysdale and the Foundation Center. Reproduced from Research Papers sponsored by the the Commission on Private Philanthropy and Public Needs, volume III, p. 1638, figure B-13.

Figure 2: *Percentage of households with charitable trust or charitable foundation by income level, United States (1973)*



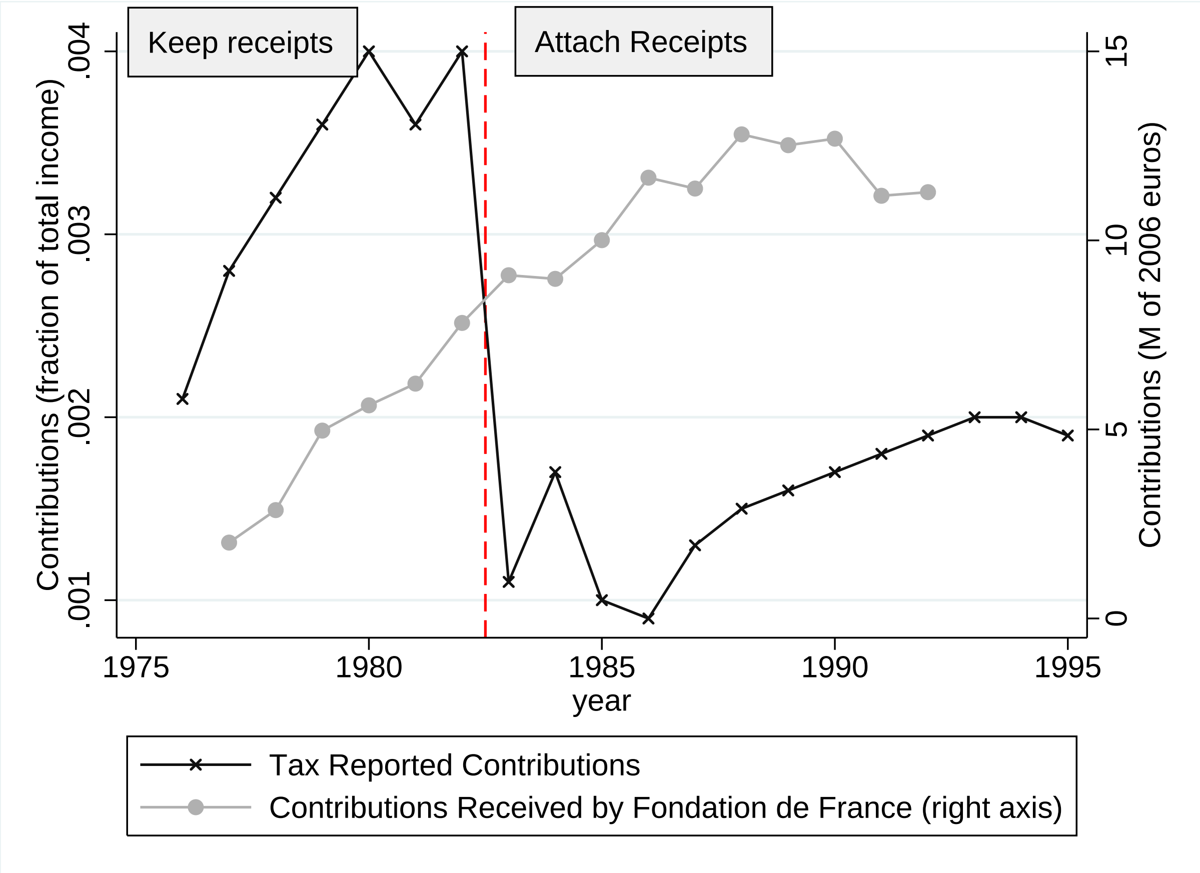
Source: IRS & Institute for Social Research (Univ. of Michigan). Research Papers, Commission on Private Philanthropy and Public Needs, vol. I, p. 188, Figure 6.
Note: P99 = 99th percentile of income excluding capital gains.

Figure 3: *Total contributions by income group, United States (1960 to 1980)*



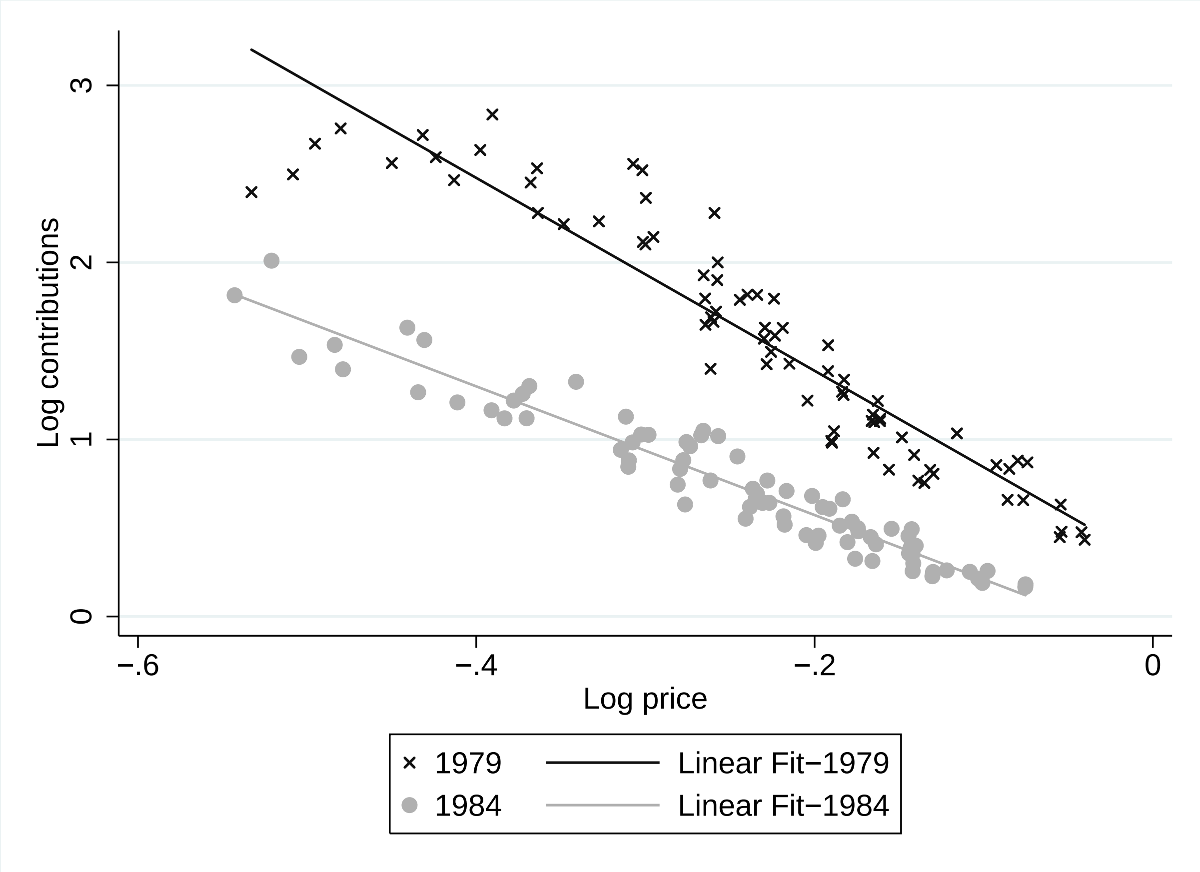
Source: IRS Microfiles 1960-1984.
Note: The graph plots the evolution of the sum of contributions in constant dollars (using CPI) and normalized to 100 in 1968 for three income groups. P99.99-100 represents households with income above the 99.99 percentile of the distribution of income excluding capital gains. P90-95 represents households with income above the 90th percentile but below the 95th percentile of the distribution of income excluding capital gains. P96-98 represents households with income above the 96th percentile but below the 98th percentile of the distribution of income excluding capital gains.
The red dashed line signals that in 1969 a tax enforcement reform tightened rules pertaining to charitable contributions to private foundations.

Figure 4: *Total reported charitable contributions as a percentage of total reported income, France (1976-1995) and total contributions received by the largest French foundation (1977-1993)*



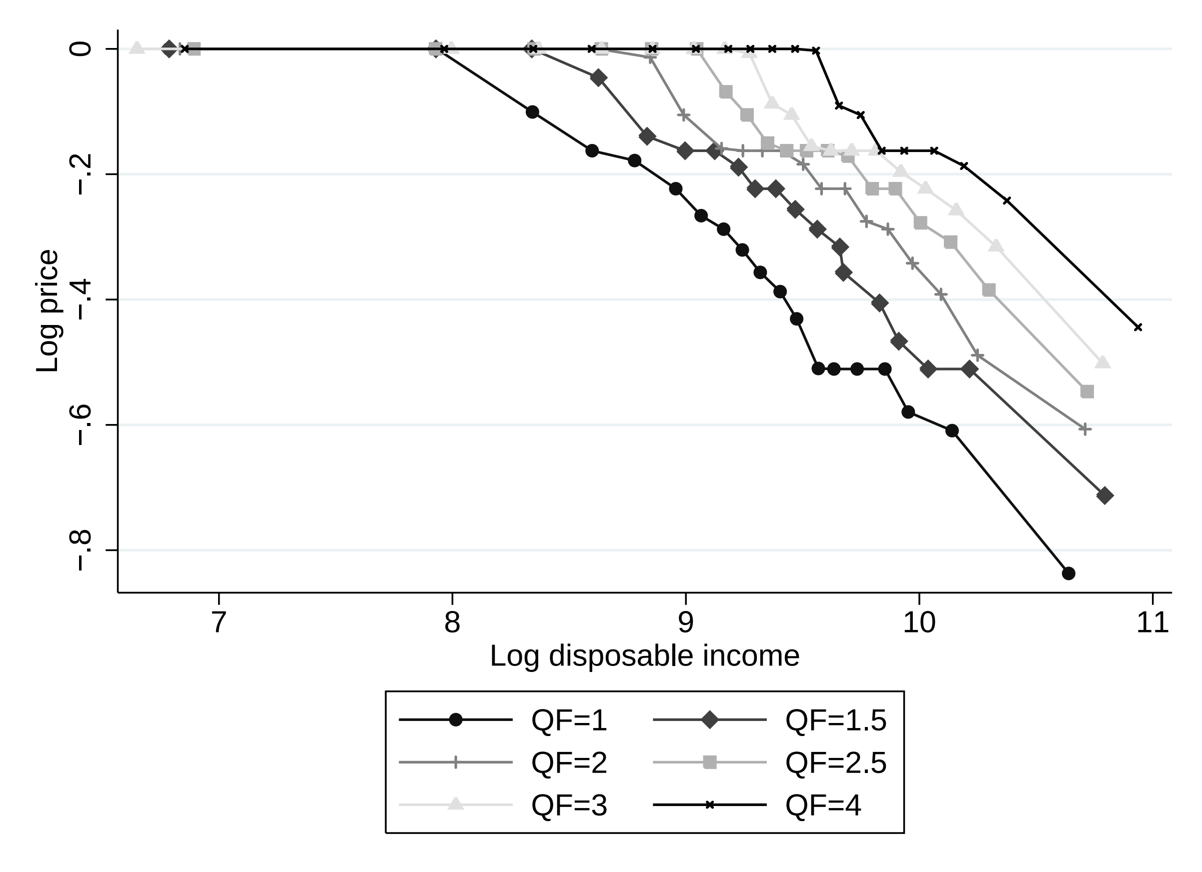
Source: Tax reported contributions computed from Etats 1921, exhaustive compilation of tax returns published by the French Tax administration. Contributions to the Fondation de France computed from annual reports of the Fondation de France.
Note:Reported contributions are always contributions reported by taxpayers in their tax returns after 1983, and not the amounts on receipts effectively sent. Before 1983, taxpayers were required to keep receipts of all the contributions claimed in their tax returns. In 1983, a reform, denoted by the dashed red line required that taxpayers attach the receipts to their tax returns.

Figure 5: *A regime change in price elasticity, France (1979 & 1984)*



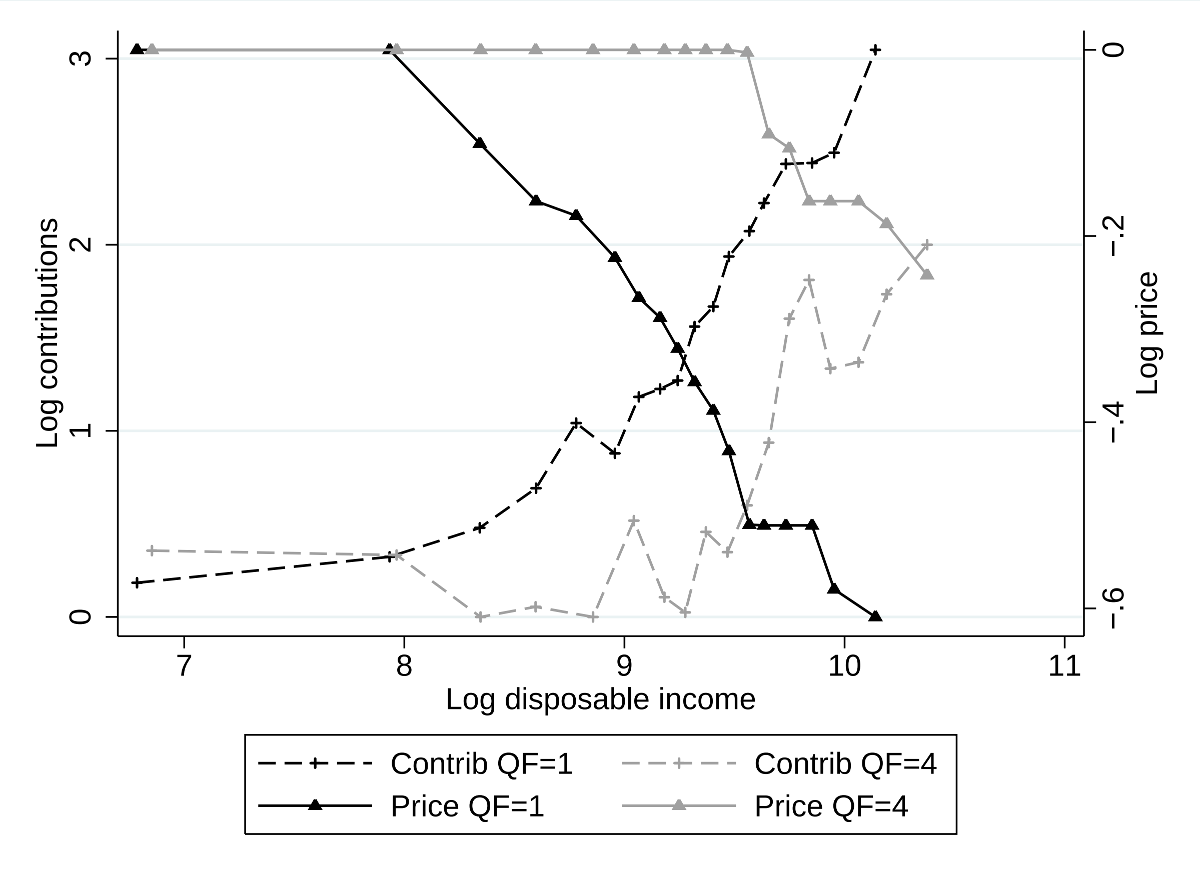
Source: ERF1979 and ERF1984.
Note: Each cross stands for a percentile of the income distribution in 1979 and plots the average log of contributions (in 2006 euros) against the average log of price for households belonging to that percentile of the income distribution in 1979. Each dot stands for a percentile of the income distribution in 1984 and plots the average log of contributions (in 2006 euros) against the average log of price for households belonging to that percentile of the income distribution in 1984. The graph gives a cross-sectional unconditional picture of the regime change in price elasticity.

Figure 6: *Log price of contributions given log of income for different groups of QF (1979)*



Source: ERF1979
Note: Each line stands for a different QF group and plots the evolution of the log price of contributions against the log of income for that QF group. Our identification strategy relies on the nonlinearities in price variations across QF groups/income groups.

Figure 7: *Log price of contributions and log of contributions given log of income for two QF groups (1979)*



Source: ERF1979
Note:: The graph shows our instrumentation strategy at work. It plots, first, the evolution of the log price of contributions (right axis-plain lines) against the log of income for two different QF groups as in figure 6. Second, it plots (left axis-dashed lines) for the same two QF groups the log contributions against log of income. The graph provides evidence that the non linearities in the price schedule due to the functioning of QF translate into giving behaviors: the price of contributions decreases at lower level of income for households with QF=1 than for for households with QF=4. Contributions for the QF=1 group increase sharply when their price decreases while contributions remain stable for the QF=4 group, until their price decreases as well.

Table 1: *Diff-in-Diff estimates of the effect of TRA69 on charitable contributions of top income households. Dependent variable: log of contributions*

	(1)	(2)	(3)	(4)	(5) (*placebo*)	(6) (*placebo*)
Treated*after69	-0.388***	-0.282***	-0.259**	-0.308***		
	(0.0128)	(0.0226)	(0.0474)	(0.0111)		
false treated*after69					0.0730	
					(0.0494)	
treated*year(65-68)						-0.0122
						(0.0312)
Controls for income & price	NO	YES	YES	YES	YES	YES
Controls for preexisting trend	NO	NO	NO	YES	NO	NO
Treatment group	P99.99-100	P99.99-100	P99.99-100	P99.99-100	P90-95	P99.99-100
Control group	P90-95	P90-95	P80-95	P90-95	P70-90	P90-95
N	84	84	98	54	126	30
Number of clusters	6	6	7	6	7	6

Source: IRS Microfiles 1960-1984. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Note:: Cluster-robust standard errors in parentheses (clustering at the income group level)
Observations are collapsed at the year*income group level.
Placebo in col(5) uses a falsely treated group (supposed to be P90-95) and uses P70-90 as a control group
Placebo in col(6) assumes that the reform took place in 1964 (1960 to 1964 vs. 1965 to 1968)

Table 2: *Estimates of* $1-\alpha$*, France, 1983. Dependent variable: log of reported contributions*

	(1) OLS	(1) OLS	(3) Logit (AME)
year84	-0.719***	-0.742***	-0.860***
	(0.0129)	(0.0131)	(0.0241)
logincome		0.0469***	0.125
		(0.0130)	(0.0864)
logprice		-1.054***	-0.459*
		(0.105)	(0.188)
20 income group FE	YES	YES	YES
# of child. & marital stat. FE	YES	YES	YES
N	80672	80672	80672
R^2	0.135	0.137	

Robust s.e. in parentheses clustered at the year*income group level.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
Identification is time series and estimates give an idea of the drop in contributions after the 1983 tax enforcement reform controlling for variations in observable characteristics.
Col(3) gives logit estimates of the Pr(Contrib> 0)

Table 3: *Estimates of price elasticity change in France (1979 vs 1984). Dependent variable: log of reported contributions*

	(1) OLS	(2) 2SLS	(3) 2SLS	(4) 2SLS
logprice79	-1.418***	-1.626***	-1.693***	-1.720***
	(0.241)	(0.267)	(0.297)	(0.291)
logprice84	-0.919***	-0.876***	-0.901***	-0.677***
	(0.146)	(0.226)	(0.292)	(0.230)
Year*income groups FE	YES	YES	YES	YES
Year*marital stat. & child. FE	YES	YES	YES	YES
Year*marit. & child. FE interacted with log(income)	NO	NO	NO	YES
N	80672	80672	80672	80672
R^2	0.128	0.128	0.127	0.135
logprice79=logprice84				
$Prob > F$	0.078	0.032	.057	0.005
Shea's Adj. Partial R^2				
logprice79		0.667	0.516	0.661
logprice84		0.652	0.466	0.630

Robust s.e. in parentheses clustered at the year*QF group*income group level.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
All specifications include non parametric controls for age, income, family size interacted with year dummies. Col. (3) include 10 (instead of 20) income groups. We report Shea's adj. partial R-square to test for weakness of our instruments which leads to strongly reject the null hypothesis of weak instruments.

Table 4: *IV-CQREG estimates of price elasticity change in France (1979 vs 1984). Dependent variable: log of reported contributions*

	q=.85	q=.9	q=.95	q=.99
			Full Sample	
logprice79	-1.319***	-1.215***	-1.608***	-2.278***
	(0.0154)	(0.0321)	(0.0320)	(0.265)
logprice84	-0.178	-0.391	-0.509	-1.417*
	(0.219)	(0.552)	(0.398)	(0.682)
			Lower income households (P0-50)	
logprice79	-	-2.777***	-2.128***	-3.199**
	-	(0.0111)	(0.0565)	(1.079)
logprice84	-	-	8.19e-10	-0.446
	-	-	(0.187e-9)	(1.810)
			Higher income households (P50-100)	
logprice79	-0.569***	-0.703***	-0.728***	-0.456
	(0.0796)	(0.111)	(0.155)	(0.453)
logprice84	0.385	0.387	-1.020**	-1.059
	(0.986)	(0.596)	(0.410)	(0.607)

These estimates are obtained using the 3-step algorithm for IV-Censored Quantile Regressions of Chernozhukov *et al.* (2010).
Bootstrapped s.e. in parentheses (50 replications)
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$
All specifications include non parametric controls for age, income, family size interacted with year dummies.

NOT FOR PUBLICATION- Additional Tables

Table 5: *Descriptive Statistics, ERF 1979 & 1984*

	1979		**1984**	
	Mean	Sd	Mean	Sd
Income	16970.2	25754.9	17608.4	20222.4
Contributions	58.4	167.5	27.0	179.3
MTR	.169	.128	.182	.131
Age	48.9	18.2	48.9	18.5
Married	.58	.493	.55	.498
Children	.65	1.07	.65	1.05
Observations	37278		43394	

Note: Income & contributions in 2006 euros
MTR: marginal income tax rate
Statistics are weighted using sample weights