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The Effect of Tax Enforcement on Tax Elasticities: Evidence from Charitable Contributions in France

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Abstract

In the "sufficient statistics" approach, the optimal tax rate is usually expressed as a function of tax elasticities that are often endogenous to other policy instruments available to the tax authority, such as the level of information, enforcement, etc. In this paper we provide evidence that both the magnitude and the anatomy of tax elasticities are extremely sensitive to a particular policy instrument: the level of tax enforcement. We exploit a natural experiment that took place in France in 1983, when the tax administration tightened the requirements to claim charitable deductions. The reform led to a substantial drop in the amount of contributions reported to the administration, which can be credibly attributed to overreporting of charitable contributions before the reform, rather than to a real change in giving behaviours. We show that the reform was also associated with a substantial decline in the absolute value of the elasticity of reported contributions. This finding allows us to partially identify the elasticity of overreporting contributions, which is shown to be large and inferior to -2 in the lax enforcement regime. We further show using bunching of taxpayers at kink-points of the tax schedule that the elasticity of taxable income also experienced a significant decline after the reform. Our results suggest that failure to account for the effect of tax enforcement on both the magnitude and the anatomy of the elasticity of the tax base with respect to the net of tax rate can lead to misleading policy conclusions, both for the global optimal tax rate (when all policy instruments are optimized) and the local optimal tax rate (conditional on all other policy instruments staying at their status quo levels, potentially away from the optimum).

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Introduction

The "sufficient statistics approach" to optimal taxation has played a prominent role in bridging the gap between theory and data, enabling economists to make much more practical tax policy recommendations. Its core idea is to express general optimal tax formulae that are both functions of estimable statistics and robust to changes in the primitives of the underlying model. In the context of optimal income taxation for instance, Feldstein [1999] and Saez [2001] have shown that optimal income tax rates can be expressed as simple functions of the elasticity of taxable income with respect to the net-of-tax rate. This has spurred a large literature trying to estimate the elasticity of taxable income in order to calibrate optimal income tax schedules. But this method has also been applied to a whole range of other tax (and non-tax) contexts, like for instance the optimal tax treatment of tax expenditures and the optimal subsidy towards charitable contributions (Saez [2004], Fack and Landais [2010]), in which case the elasticity of reported charitable contributions with respect to the subsidy rate becomes a key "sufficient statistics" entering the optimal subsidy formula. Of course, these elasticities, like the elasticity of taxable income, may incorporate various margins of responses and may in fact be the sum of various behavioural elasticities, such as evasion or avoidance elasticities. But the interest of sufficient statistics approaches is that in certain cases, the anatomy of these elasticities is irrelevant for optimal policy (Feldstein [1995], Chetty [2009]).

In practice, tax authorities have many more instruments than the mere tax rates. They can for instance adjust the level of information available to taxpayers, the level of tax enforcement or the audit rates on certain items of the income tax, or vary the size of the tax base by allowing or restricting certain deductions. An important characteristic of optimal tax formulae expressed in "sufficient statistics" is that the relevant statistics, and in particular the relevant tax elasticities needed to calibrate the optimal value of a particular tax rate or tax subsidy are potentially endogenous to the full set of policy parameters available to the social planner. This relationship between "tax elasticities" and other policy instruments has at least two critical implications for optimal policy.

First, the tax authority has access to various policy instruments that can potentially control the *magnitude of the behavioral elasticities* entering the optimal tax rate formula (Kopczuk and Slemrod [2002] and Kopczuk [2005]). As a consequence, estimates of the tax elasticities, which are often conditional on particular values of the other instruments, may be misleading when thinking about the global optimum, where all policy instruments are set optimally. Optimizing the tax rate for a given tax elasticity can lead to a local optimal tax rate that will be very different from the tax rate at the global optimum if tax authorities have access to another instrument that could set the tax elasticity itself at its optimal level. Even though the importance of the derivative of the taxable income elasticity with respect to other policy instruments such as tax enforcement or the size of the tax base has been discussed conceptually in Kopczuk and Slemrod [2002], little empirical evidence exists on the magnitude of this derivative.

Second, the policy instruments available to the government will often also control the *anatomy of the behavioral elasticities* entering the optimal tax rate formula. When there are no other external parties than the government, the aggregate impact of a tax change on government revenue is sufficient to identify the deadweight loss of taxation, and knowledge of the anatomy of the response is not necessary. However, in many contexts, such as in the presence of externalities, of pre-existing distortions, or of transfer costs of tax sheltering, knowledge of the anatomy of behavioral responses will prove necessary to compute the deadweight loss associated with a given tax rate (Chetty [2009], Giertz et al. [2012]). In other words, in many contexts, the anatomy of responses to variations in the tax rate (cheating vs real responses, etc.) is critical to characterize the local optimum, *i.e.* the optimal tax rate conditional on all other instruments staying at their status quo level, potentially away from their own optimal level. In the context of charitable giving for instance, there are clearly external parties, and we believe that there might be externalities to these parties at the margin from additional giving. Failure to account for the anatomy of responses, which is endogenous to all policy instruments, will therefore also lead to misleading policy recommendations.

The aim of this paper is to provide evidence on the relationship between tax elasticities and one particular policy instrument traditionally available to tax authorities: the level of tax enforcement through third party reporting. We exploit a tax enforcement reform on charitable deductions in France to study the effect of an increase in the traceability of reported contributions on tax reporting behaviours, the elasticity of reported contributions and the elasticity of taxable income. Before 1983, taxpayers were automatically granted the tax deduction on the basis of their self-reported tax declaration, and had to keep a receipt of their contributions in the event of a tax audit. From 1983 onwards, the French tax administration required taxpayers to attach the receipts of their charitable contributions to their tax return when claiming the charitable deduction. In other words, taxpayers could only benefit from tax deductions if they provided the administration with a proof of the contribution issued by a third party - the charity. This tax enforcement reform allows us to study how different tax regimes affect the reporting of charitable contributions, the magnitude of tax elasticities and the anatomy of these tax elasticities.

Our paper contributes to the literature by first documenting the drastic effects on reported charitable contributions of this simple tax enforcement reform that tightened the reporting rules.[1] The reform was associated with a substantial drop in the amount of contributions reported to the administration: in the year following the reform, reported contributions dropped by more than 75% and never recovered half of their pre-reform level more than 25 years later. We show using external sources on contributions that this drop can be credibly attributed to a change in taxpayers' reporting behaviours, rather than to a real change in giving behaviours. We also provide clear evidence that a very large fraction of this drop is caused by the overreporting of charitable contributions before the reform rather than by the underreporting after the reform.[2] The fraction of overreported contributions in the lax enforcement regime before the reform was, even in the more conservative scenario, close to 40%, and around 60%, according to our preferred estimates. Apart from LaLumia and Sallee [2013] who analyze "missing children" that disappeared from income tax declarations when a reform made it difficult to falsely claim additional dependents, this is the first time such massive reporting effects of a simple tax enforcement reform are documented.[3]

The second and main contribution of our paper is to show that both the elasticity of reported contributions and the elasticity of taxable income are substantially affected by the tax enforcement reform. We use two strategies to estimate the elasticity of reported contributions with respect to the price of giving before and after the reform. We first exploit the system of family income splitting in the French tax system (Quotient familial) which creates substantial non-linearities in the tax schedule according to taxpayer's family structure. We next use the presence of a cap in the subsidy

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[1] To our knowledge, the only other available evidence of the presence of tax evasion in the context of the charitable deduction is Ackerman and Auten [2011], who analyze deductions for non-cash donations in the US, and show that following a reform that tightened the rules for appraising the value of donated cars, the amount of claimed deductions for car donations decreased significantly, suggesting that previous claims were overvalued. Yermack [2009] analyzes contributions of stocks by CEOs to their own private foundations and also finds substantial re-timing effects suggestive of tax avoidance.

[2] Rehavi and Shack [2013] provide evidence of underreporting of contributions in the US income tax system.

[3] A few papers have investigated how the elasticity of evasion may vary with the level of enforcement, but in a very different context than our paper, that does not involve reporting of taxable income by taxpayer. Marion and Muehlegger [2008], who study the introduction of a regulatory innovation (the addition of red dye to untaxed diesel) show a very large response to a tax enforcement reform. In the case of tariffs and customs duties, Mishra et al. [2008] show that the responsiveness of evasion with respect to tariffs varies with some characteristics of the products that can serve as a proxy for the tax enforcement cost.

for a particular type of contributions as a source of exogeneous variation in the price of giving. Both strategies give very similar qualitative results and show that the reform was associated with a substantial decline in the absolute value of the elasticity of reported contributions with respect to the net-of-tax rate. This evidence of a decline in the absolute value of the elasticity of reported contributions is consistent with the fact that a large fraction of the drop in contributions is due to overreporting before the reform rather than to underreporting after the reform. We then show that the tax enforcement reform, by affecting the elasticity of one of the components of the income tax base, did significantly affect the elasticity of taxable income. We provide evidence of significant bunching of taxpayers at kink-points of the tax schedule before the reform. We show that bunching before the reform was correlated with the propensity of reporting positive contributions. After the reform, no such bunching can be detected at the kink points of the tax schedule, thus attesting that the elasticity of taxable income experienced a significant decline when enforcement rules where tightened.

We finally contribute to the literature by showing that the drop in the absolute value of the elasticity of reported charitable contributions can be credibly attributed to the fact that the elasticity of non-compliance (overreporting contributions) was large before the reform. We show how one can use the estimated change in the elasticity of reported contributions before and after the reform to partially identify the elasticity of overreported contributions before the reform. Our results suggest that the elasticity of overreporting contributions with respect to the net-of-tax rate was large and inferior to -2 in the lax enforcement regime before the reform. Interestingly, the elasticity of non-compliance using charitable contributions appears to be larger for taxpayers with little access to other margins for adjusting their taxable income: low income taxpayers and taxpayers with wage income only.

Overall, these results confirm that tax elasticities used in optimal tax formulae, such as the elasticity of various itemized deductions or the elasticity of taxable income with respect to the net-of-tax rate, are in fact sensitive to variations in other policy instruments available to the tax authorities. In our context, the policy instrument is the level of enforcement of a particular income tax deduction. But many other policy instruments, such as the level of information provided to taxpayers for instance, are also susceptible to affect these tax elasticities. When these other instruments are not set optimally, recommendations based on calibrating optimal tax formulae with estimated tax elasticities should be interpreted with caution, as they may lead to misleading conclusions compared to the global optimum where all tax instruments are optimized.

The remainder of the paper is organized as follows. Section 1 lays out the conceptual framework of the paper, which will serve as a guide to the empirical analysis. In section 2, we present the institutional background of the 1983 reform and the data; we also document the drastic drop in reported charitable contributions and show why most of the drop can credibly be attributed to overreporting before the reform. In section 3, we provide evidence of a substantial drop in the elasticity of reported contributions with respect to the price of giving after the reform. In section 3.3, we further show that the reform is also associated with a decline in the elasticity of taxable income using bunching at the kinks in the tax schedule. In section 4, we show how we can use this change in the elasticity to partially identify the elasticity of overreporting with respect to the net of tax rate. Finally section 5 concludes by discussing the policy implications of our findings.

1 Conceptual framework

The relationship between tax elasticities and other policy instruments available to the tax authority has at least two critical implications for optimal policy. First, these policy instruments can often control the *magnitude of the behavioral elasticities* entering the optimal tax rate formula. Second, these policy instruments will often also control the *anatomy of the behavioral elasticities* entering the optimal tax rate formula.

In this section, we briefly formalize these two ideas in relation to our context of interest, *i.e* the optimal tax treatment of charitable contributions. This framework, which draws on Kopczuk and Slemrod [2002] and Saez [2004] is meant to explain formally how the impact of tax instruments such as tax enforcement on tax elasticities is critical for welfare analysis. It is also meant to organize and guide our empirical analysis in uncovering how tax enforcement may affect both the magnitude and the anatomy of tax elasticities.

The setup of the model is as follows. There is a continuum of individuals with density $d\nu(i)$ over i, $i \in I$, I being an index set. There are 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. Earnings are taxed at rate t, and taxes on earnings are used to finance a demo grant R. 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.[4] Contributions are eligible for a tax subsidy τ from the government. We take into account the possibility that the amount of the contribution good reported to the tax authority g^r differs from the true level g of contributions made. We denote by $g^m = g^r - g$ the amount of misreported contributions, that is, the difference between reported and true contributions. This difference will critically depend on the level of a policy parameter p available to the government, which can be thought of as the level of tax enforcement of the subsidy for charitable contributions. This general formulation encompasses all possible forms of overreporting or underreporting of contributions. For exposition purposes, we will mostly focus here on the example of overreporting, when individuals evade taxes through the contribution good: individuals can report "cheating contributions" in their tax form and gain an extra subsidy on these cheating contributions.[5] Importantly, because the enforcement technology p generates a resource cost for individuals, both the level of reported contributions and their responsiveness to the subsidy rate are functions of the tax enforcement level p.[6]

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

$$\max_{c,z,g,g^m} U^i = u^i(c,z,g,g^m,G,p)$$

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

where τ is the tax subsidy rate on contributions and t is the (linear) tax rate on earnings. We denote by $\nu^i(1-t,1-\tau,G,R,p)$ the indirect utility function of individual i. Demand functions, given the policy parameters, are denoted by $z^i(1-t,1-\tau,G,p,R)$ for earnings, $g^i(1-t,1-\tau,G,p,R)$ for true contributions, and $g^{m^i}(1-t,1-\tau,G,p,R)$ for misreported contributions. With the Roy's identity conditions, we can also compute the welfare effect of changes in t and τ for each individ-

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[4] We consider each individual atomistic, so that G is considered as given by each individual.

[5] Note that we assume that misreporting contributions has a utility cost for individuals. In the context of cheating for instance, this is meant to reflect the probability of being caught and getting a fine, or simply the existence of pro-social compliance preferences. This utility cost makes our model formally comparable to a Allingham and Sandmo [1972] tax evasion model or a Slemrod-type avoidance model (Slemrod and Stephan [2007]).

[6] Examples of resource costs created by p can be costly information acquisition, increased utility cost of cheating, etc. Note that all results would carry through if we assume that the costs generated by p are transfer costs (such as paying for a tax accountant) rather than resource costs.

ual: $\nu^i_{1-t} = z^i \nu^i_R$ and $\nu^i_{1-\tau} = -(g+g^m)\nu^i_R$.

The government's program can be written as follows:

$$\begin{aligned} \max_{t,\tau,p} W &= \int \mu^i \nu^i(1-t, 1-\tau, G, p, R) \\ \text{s.t.} \quad t\bar{Z} &\geq R + \tau \underbrace{(\bar{G}+\bar{G^m})}_{\bar{G^r}} + C(p) \end{aligned}$$

where μ^i is the social weight associated with individual i in the social welfare function. $C(p)$, $C'(p) > 0$ is the administrative cost of enforcement and $\bar{G} = \bar{G}(1-t, 1-\tau, p, R)$, $\bar{G^m} = \bar{G^m}(1-t, 1-\tau, p, R)$, $\bar{G^r} = \bar{G^r}(1-t, 1-\tau, p, R)$ and $\bar{Z} = \bar{Z}(1-t, 1-\tau, p, R)$ denote average true contribution, average misreported contribution, average reported contribution and average earning for a given level of the policy parameters.

We denote by λ the Lagrange multiplier of the government budget constraint, which is equal to the social marginal value of public funds. The first-order conditions of the government's program with respect to τ and p are:

$$(\tau): \qquad \int \mu^i[\nu^i_{1-\tau} + \nu^i_G \bar{G}_{1-\tau}]d\nu(i) + \lambda[t\bar{Z}_{1-\tau} + \bar{G^r} - \tau\bar{G^r}_{1-\tau})] = 0 \tag{1}$$

$$(p): \qquad \int \mu^i[\nu^i_p + \nu^i_G \bar{G}_p]d\nu(i) + \lambda[t\bar{Z}_p - \tau\bar{G}^r_p - C'(p))] = 0 \tag{2}$$

where for all variables X and y, X_y denotes the partial derivative of X with respect to y.

Tax enforcement and the magnitude of tax elasticities The second-term in the first-order condition for τ shows that the optimal level of the subsidy τ depends on the fiscal externality (through the government budget constraint) generated by a change in τ. This fiscal externality depends on the behavioral responses of earnings $\bar{Z}$ and reported contributions $\bar{G^r}$ to variations in the net-of-subsidy rate $(1-\tau)$. These behavioral responses can be recast in terms of elasticities, that can then be identified empirically to provide direct policy recommendations. This is the essence of the sufficient statistics approach.

But the first-order condition for p reminds us that the behavioral elasticities of earnings $\bar{Z}$ and reported contributions $\bar{G^r}$ with respect to $1-\tau$ are endogenous to p, and that the government, by controlling p, can control the level of these behavioral elasticities. The optimal level of p, implicitly defined by the first-order condition for p will trade-off the direct utility cost/gain of a change in p (first-term of the FOC) with the fiscal externality generated by a change in p (second term of the FOC). This fiscal externality will in particular depend on how changes in tax enforcement p affect the behavioral elasticities. To see this, note that for any τ^*, we have that:

$$\tau^* \bar{G}^r_p = \int_0^{\tau^*} \Big(\underbrace{\bar{G}^r_p(1 - \frac{\tau}{1-\tau}\varepsilon_{G^r})}_{\text{Direct effect}} - \overbrace{\bar{G}^r \frac{\tau}{1-\tau} \frac{\partial \varepsilon_{G^r}}{\partial p}}^{\text{Elasticity control}} \Big) d\tau. \tag{3}$$

where ε_{G^r} is the elasticity of reported contributions with respect to the net-of-subsidy rate $1-\tau$.[7] The above formula states that a change in p creates a fiscal externality through reported contributions $\bar{G}^r$ that can be decomposed into two effects.[8] First, there is a direct effect of changing p on the level of reported contributions and therefore on the direct fiscal cost of the subsidy τ. And second, p affects the elasticity of $\bar{G}^r$ for any given level of the subsidy τ. This effect stems from the "ability" of p to control the elasticity of reported contributions: $\frac{\partial \varepsilon_{G^r}}{\partial p} \neq 0$. This implies that choosing the optimal level of tax enforcement p is equivalent to setting optimally the level of the behavioral elasticities entering the formula for the optimal level of τ.

This point, as already mentioned in Kopczuk and Slemrod [2002], has important welfare consequences. If p is set far from its optimal value, then the local optimum for τ, that is the level of τ that satisfies FOC (1) conditional on p, can be very different from the global optimum value of τ, that is the value of τ when all policy parameters are jointly optimized. For instance, if enforcement p is too lax, the elasticity ε_{G^r} might be too high, implying a large marginal deadweightloss of the subsidy τ and a low optimal rate τ. But tax enforcement could be made much tighter, thus reducing the value of the elasticity ε_{G^r} and therefore reducing the marginal deadweightloss of τ, so that the global optimum will be characterized by a much higher level of the subsidy τ combined with strict enforcement. Everything else equal, the difference between the local and the global optimum value

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[7] To derive the above expression, note that for any positive τ^*, we have:

$$\tau^* \bar{G}^r = \int_0^{\tau^*} \Big(\tau \frac{\partial \bar{G}^r}{\partial \tau} + \bar{G}^r \Big) d\tau = \int_0^{\tau^*} \bar{G}^r \Big(1 - \frac{\tau}{1-\tau} \varepsilon_{G^r} \Big) d\tau$$

Differentiating this formula with respect to p yields formula (3).

[8] A similar decomposition can be obtained for the fiscal externality $t\bar{Z}_p$.

of τ will be larger the more responsive the behavioral elasticities are to variations in enforcement p. One of the goal of this paper is to show that in many contexts, such as the one studied here, behavioral elasticities are indeed quite sensitive to variations in the enforcement environment.

Note however that if tighter enforcement has the benefit of reducing the behavioral elasticities entering the optimal subsidy formula, it also comes at a potential welfare cost for individuals. In FOC (2), this welfare cost is captured by the first term $\int \mu^i [\nu^i_p + \nu^i_G \bar{G}_p] d\nu(i)$. Tighter enforcement can entail a direct utility cost for individuals ($\int \mu^i \nu^i_p d\nu(i) < 0$) if it makes reporting contributions more complicated, acquiring information more costly, or more generally if it increases any optimization frictions preventing individuals from perfectly optimizing their behavior for a given level of t and τ. In our context, it may also affect the total level of public good G, thus affecting the utility of individuals through a change in the externality ($\int \mu^i \nu^i_G \bar{G}_p d\nu(i)$). The optimal level of enforcement p will trade-off the benefits of reducing the tax elasticities with the utility costs associated with higher frictions and a change in the value of the public good G.

Finally, when the subsidy for charitable contributions operates as a deduction from taxable income ($t = \tau$), as was the case in France during our period of interest and as is still the case in the US tax system, the fiscal externality $\tau \bar{Z}_{1-\tau} + \bar{G}^r - \tau \bar{G}^r{}_{1-\tau}$ in (1) can be recast in terms of elasticity of taxable income (ETI=$\frac{\partial(Z-G^r)}{\partial(1-\tau)} \frac{1-\tau}{Z-G^r}$) and variations in the enforcement of the charitable deduction p are also susceptible of directly affecting the magnitude of the ETI which is critical to determine the deadweight loss of income taxation and the optimal income tax rate.

Tax enforcement and the anatomy of tax elasticities The effect of tax enforcement on tax elasticities is not only important to characterize the global optimum. It is often important to characterize the local optimum as well. The reason is that the level of tax enforcement determines not just the size but also the anatomy of tax elasticities. These elasticities, like the elasticity of taxable income or the elasticity of reported contributions, may incorporate various margins of responses and may in fact be the sum of various behavioural elasticities, such as evasion or avoidance elasticities. The interest of sufficient statistics approaches is that in certain contexts, the anatomy of these elasticities is irrelevant for optimal policy (Feldstein [1995], Chetty [2009]). For instance, when there are no other external parties than the government, the aggregate impact of a tax change on government revenue is sufficient to identify the deadweight loss of taxation, and knowledge of the anatomy of the response is not necessary. However, in many contexts, such as in the presence of externalities, of pre-existing distortions, or of transfer costs of tax sheltering, knowledge of the anatomy of behavioral responses will prove necessary to compute the deadweight loss associated with a given tax rate (Chetty [2009], Giertz et al. [2012]). In other words, in many contexts, the anatomy of responses to variations in the tax rate (cheating vs real responses, etc.) is critical to characterize the local optimum, *i.e.* the optimal tax rate conditional on all other instruments staying at their status quo level, potentially away from their own optimal level. In the context of charitable giving for instance, there are clearly external parties, and we believe that there might be externalities to these parties at the margin from additional giving.

From FOC (1), it is clear that both responses, the response of true contributions $\bar{G}_{1-\tau}$ and the response of reported contributions $\bar{G^r}_{1-\tau}$ to the net-of-subsidy rate, matter to determine the optimal value of τ conditional on any p. The intuition is straightforward. Because only real contributions G generate an externality, the response of real contributions determines the size of the public good externality, while the size of the fiscal externality depends only on the response of reported contributions that receive the subsidy τ.

In appendix 5.1, we show that, under a few limited assumptions the local optimal level of τ is implicitly defined by the following expression:

$$\alpha \cdot \varepsilon_G - (1-\alpha) \cdot \frac{\tau}{1-\tau} \cdot \varepsilon_{G^m} = -1 + \beta(\bar{G}^r) \tag{4}$$

where $\alpha = \frac{\bar{G}}{\bar{G}^r}$ is the share of "true" contributions in reported contributions. ε_G is the elasticity of true contributions with respect to $1-\tau$, and ε_{G^m} is the elasticity of misreported contributions with respect to $1-\tau$. $\beta(\bar{G}^r) = \int \frac{\mu^i g^r \nu^i_R}{\lambda \bar{G}^r} d\nu(i)$ is the average social marginal value of consumption in terms of public funds weighted by reported contributions.

Formula (4) can also be written in terms of elasticity of reported contributions. At the optimum, the subsidy rate must be such that:

$$\varepsilon_{G^r} = -1 + \beta(\bar{G}^r) - \frac{1-\alpha}{1-\tau} \cdot \varepsilon_{G^m} \tag{5}$$

Formula (5) states that when the elasticity of reported contributions is larger in absolute value than the absolute value of the right hand side, the subsidy rate should be increased. In the absence of misreporting, and when the welfare of contributors is not taken into account ($\beta(\bar{G}^r) = 0$), equation 4, collapses to the *unit elasticity rule* popularized by Feldstein and Clotfelter [1976]: the subsidy should be increased if $|\varepsilon_G| = |\varepsilon_r| \geq 1$.

Importantly, failing to acknowledge the anatomy of the elasticity of reported contributions may lead to biased policy recommendations. And such anatomy is directly determined by the enforcement level. When enforcement is lax, taxpayers may overreport contributions and the fraction of overreported contributions ($1-\alpha > 0$) may be large. If such misreported contributions are very elastic to the net-of-subsidy rate, the elasticity of reported contributions will be large as well. Calibrating the formula for the optimal level of the charitable deduction using such a large elasticity of reported contributions and not taking into account the correction term for the elasticity of overreported contributions will lead to set the subsidy at an inefficiently high level. The degree of the bias in setting the optimal subsidy rate will depend on the share of misreported contributions and the magnitude of the elasticity of misreported contributions. Alternatively, if enforcement is too strict, taxpayers may underreport contributions ($1-\alpha < 0$). In this case, the elasticity of reported contributions may appear too small, and lead to an inefficiently low level of the subsidy.

Guide to empirical implementation In the remainder of the paper, we explore empirically the impact of tax enforcement (p) on both the magnitude and the anatomy of tax elasticities using a reform that tightened the enforcement of the deduction for charitable contributions in the French income tax system. Our empirical implementation proceeds in three steps.

First, we document the effect of the reform on reported contributions, and try to identify the share of misreported contributions $1-\alpha$ for the lax and for the tight enforcement regime. This share is critical to assess the local optimal subsidy rate. We provide evidence of large overreporting of contributions in the lax enforcement regime with $1-\alpha \approx .6$.

Second, we investigate how tax enforcement p affects the magnitude of the elasticity of reported contributions. We provide evidence that $d\varepsilon_{G^r}/dp$ is large. Because the subsidy rate τ is tied to the income tax rate t in our context, we also investigate the effect of the enforcement reform on the ETI and provide evidence that $d\text{ETI}/dp \neq 0$. This means that policy instruments such as the enforcement level of various items of the income tax system have some power of control over the tax elasticities that are relevant for optimal tax rate formulae.

Finally, we investigate how the tax enforcement level determines the anatomy of the elasticity of reported contributions. We use our empirical set up to provide partial identification of the elasticity of overreporting ε_{g^m}. We provide evidence that, in the low enforcement regime, ε_{g^m} is large and the elasticity of reported contributions is mainly driven by overreporting behaviors.

2 The 1983 reform and reported charitable contributions

2.1 Institutional background

Tax incentives for charitable giving were introduced in 1954 in the French income tax code.[9] Charitable contributions were deductible from taxable income, but the cap for deductions was originally set at a very low level (.5% of taxable income). The situation changed in the beginning of the 1970s, when the role of the charitable sector began to be recognized and the government set out to encourage its development. The deduction cap was increased to 1% for most charities in 1975,[10] and additional deductions were granted for specific types of charities (the Fondation de France and *Associations reconnues d'utilité publique*). In 1989, the deduction from taxable income was transformed in a non-refundable tax credit, and tax incentives have since been further increased.[11] As the government increased tax incentives for charitable contributions, the tax administration tightened the rules for claiming the deduction. Until 1982, taxpayers were only asked to keep a receipt of every contribution they claimed on their tax return. 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. These receipts had to be produced in the event of a tax audit. In 1983, the French tax administration required taxpayers to attach these receipts to their tax return when claiming the charitable deduction.[12] This new requirement severely limited the possibility of falsely overreporting charitable contributions in the tax declaration.[13] We exploit this reform in order to analyze the evolution of charitable contributions reported in tax declarations in a lax versus strict enforcement regime.

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[9] *Loi n^{o}54-817 du 14 août 1954, art. 11.*

[10] *Loi n^o 75-1278 du 30 déc. 1975, art 5.*

[11] See Fack and Landais [2010].

[12] The reform was voted in december 1981 *(Loi de finances pour 1982, n^{o}81-1160 du 30 déc. 1981, art. 87-I)* but the enforcement decree was published later in 1982 (*Arr. 21 janv. 1982* published in *Journal Officiel du 14 mars 1982*). As a result, 1983 is the first year for which taxpayers cannot get any deduction if they do not provide the receipt (see MIN [1984], pp. 10-13).

[13] To our knowledge, the system of tax enforcement was not subject to any other important modification around this period (see Piketty [2001], chapter 6, section 2.)

2.2 Data

To get a first idea of the impact of the tax enforcement reform on reported contributions, we calculate aggregate time-series of charitable contributions reported in income tax files, from the annual statistical publications of the Ministry of Finance (*Etats 1921*). In the econometric analysis, we use individual data from four cross-sections of tax returns (1975, 1979, 1984, 1988), drawn every 4 to 5 years by the French tax administration for research purposes. Each sample contains around 50,000 taxpayers, with oversampling of high income households. The data therefore contains information on source of income, deductions claimed, income taxes paid, transfers received, plus standard information on marital status and number of children. We observe the total amount of reported contributions for each taxpayer and, from 1984 onwards, we also have information on receipts sent.

Descriptive statistics of the tax data before and after the 1983 reform are shown in Table 1, where samples from pre-reform years (1975 and 1979) and post-reform years (1984 and 1988) are pooled. Average taxable income increases slightly over the years, as well as the average marginal tax rate which goes from 15% before the reform to 17% afterward. This change in the average tax rate is mainly driven by the fact that the thresholds of the various brackets of the income tax schedule increased at a lower rate than taxable income and also by the introduction of a 65% marginal tax rate at the top of the income distribution after the 1981 French presidential election (the top tax rate was 60% before 1981).[14] In comparison to these limited changes in average income and taxes, the drop in the percentage of donors and in reported contributions is striking. While around 20% of taxpayers reported a positive contribution in their tax declarations before the enforcement reform, the Figure drops to 9% afterward. The average contribution decreases by almost 60%: expressed in 2010 euros, the average contribution drops from 41 euros to 17 euros after the reform. We investigate further the timing of these changes, as well as their potential causes in the next sections.

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[14] While this change in the top marginal tax rate (from 60 to 65%) in 1981 is unlikely to affect our elasticity estimates, we exclude for transparency the top 5% of taxpayers with the highest taxable income in our estimation of the elasticity of reported contributions so that, in the restricted sample, the top tax rate remains 60% throughout the period.

2.3 First Evidence of a drop in reported contributions after 1983

We begin by providing evidence that the 1983 reform induced a massive and lasting drop in tax-reported charitable contributions. In Figure 1, we plot the evolution of total reported contributions as a fraction of total income over time. The data come from the exhaustive compilation of tax returns published by the French Tax administration (*Etats 1921*). The total level of contributions as a percentage of total income dropped by almost 75% between 1982 and 1983, from about .4% to .1% of total income. Interestingly, even in 2000, more than 17 years after the reform, the total amount of reported contributions as a fraction of income had hardly reached back half of its 1982 level. In appendix, we show that the large drop in contributions observed in aggregate data is also present in our repeated cross-sections of individual tax files, and that it is robust to the inclusion of controls for changes in the demographic characteristics of the population and for variations in income growth over time.

In order to assess to what extent the drop in contributions is due to a change in real giving behaviour or to reporting effects, we also use an external source of information on charitable contributions. There is unfortunately no comprehensive data on actual charitable contributions in the early 1980s in France, apart from the information collected in tax files, but we had access to the Annual Financial Reports of the Fondation de France (from Pavillon [1995]). The Fondation de France is an umbrella foundation collecting money for a large number of smaller foundations and associations. In 1979, contributions to the Fondation de France represented 7% of all contributions to foundations reported to the tax administration. The consistent financial information available for this charity from 1977 on allows us to follow the evolution of contributions around the reform date. We display in Figure 1 the evolution of contributions received by the Fondation de France around the reform date, measured in constant euros along with the evolution of total contributions (as a percentage of taxable income) reported in tax files over the same period. In appendix Figure A.1 we also display the evolution of contributions received by the Fondation de France as a percentage of total taxable income. Contributions to the Fondation de France exhibit the same trends than the ones observed for the contributions reported to the tax administration, with a twofold increase between the late 1970s and the mid 1980s and a stabilization afterward. The only striking difference is the absence of a drop in 1983. The evolution of contributions received by this charity is indeed very smooth in the years around the reform. Overall, this evidence strongly suggests that the massive decrease in contributions reported to the tax administration that occurs in 1983 is attributable to a drastic change in reporting behaviors after the tax enforcement reform, rather than to a sudden change in actual giving behaviours.

2.4 Overreporting vs underreporting

Even if the 1983 reform appears to have changed the taxpayers' reporting practices, it is not a priori clear in which direction they were modified. Two main changes in reporting behaviours could have occurred: a decrease in the amount of overclaimed tax deductions after the tightening of the reporting rules, or an increase in the fraction of gifts that are not reported in the tax declarations. Overreporting may have been a relatively easy way to evade taxes before 1983, by taking advantage of the low enforcement regime. But underreporting may also be taking place after 1983 because the new regime, with the requirement to attach the receipts, now increases the cost of reporting contributions. A few studies have for instance documented the presence of inertia and procrastination in tax reporting behaviours (Jones [2012]) or underreporting of tax deductions (Rehavi and Shack [2013]). Households are likely to face similar transaction costs in the French setting, but there are reasons to think that the extra reporting cost induced by the reform was relatively small. The system of issuing receipts had been in place for fifteen years and was well functioning at the time of the reform. The reform did not involve any additional tax form to fill. Moreover, if the cost of collecting documents had increased, it would likely have primarily affected the reporting behavior of small donors, as the tax deduction for small gifts might not be worth the effort to incur these additional costs. We would therefore expect the frequency of small contributions to decrease after the reform. On the contrary, Figure 2 shows that, among taxpayers who reported a positive gift in their tax declaration, the fraction who reported small gifts did not decrease, but actually increased between 1979 and 1984, while the fraction who reported large contributions decreased.[15] This change in the distribution of contributions is indeed consistent with the presence of overreporting behavior before the reform, deterred by the tightening of the rules after the reform.

The level of underreporting under the current legislation is precisely estimated in a series of surveys (CERPHI surveys) conducted yearly between 2000 and 2004 for a consortium of French foundations. The surveys sample active donors and check whether the donors actually reported

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[15] We unfortunately do not have information on the specific amount of each gift, and it is possible that individuals who gave to multiple causes lost some of their receipts, causing a decrease in reported contributions. However, if this was the case, we would have expected a smooth shift in the entire distribution of gifts, which is not what we observe.

their contributions to the tax administration. Results are extremely stable across years and indicate that 80% of contributions are reported to the tax administration.[16]

Based on these survey results, we can make some assumptions on the size of underreporting in order to assess which part of the drop in contributions was likely caused by a decrease in overreporting. We make two alternative assumptions in order to estimate the amount of overreporting before 1983 (cf. Figure A.2 in Appendix). In the first scenario, we make the assumption that underreporting occurs after 1983 and is stable over time. Using the average estimate of 20% of underreporting available from the CERPHI surveys, we rescale the series of reported contributions to get an estimate of the actual level of contributions after 1983. We then compare the average level of contributions in years 1980 to 1982 to the average level of the rescaled contributions in years 1983 to 1985. In this case, overreporting accounts for roughly 60% of total reported contributions before the reform. Next, we make the very conservative assumption that all the increase in reported contributions from 1984 to 2000 is due to an increase in reporting and not to an increase in actual contributions to charities. This assumption is conservative because we know from external sources such as Fondation de France that contributions tended to increase faster than real income in the 1990s. This alternative scenario therefore gives us a conservative lower bound on the amount of overreported contributions before 1983. Even with this conservative assumption, overreported contributions still account for 37.5% of total contributions reported to the tax administration before the reform. Overall, this suggests that a very significant fraction, between 40 to 60%, of contributions reported to the tax administration before 1983, consisted in fake contributions or overreported contributions with no real counterpart.

In the next section, we precisely estimate the elasticty of reported contributions with respect to the price of giving before and after the reform. We provide evidence that this elasticity also exhibited a large drop in absolute value. As we explain in section 4, this is further evidence of the presence of overreporting before the 1983 reform.

3 Impact of the reform on tax elasticities

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[16] Unfortunately, we did not have access to the micro data of the CERPHI surveys but to tabulations published in Malet [2003] and Malet [2005].

3.1 Estimation of the price elasticity of reported contributions before and after the reform

The main challenge in estimating the price elasticity of charitable contributions is the simultaneous variations of income and price of giving, which are difficult to disentangle in cross-sections. As the French tax treatment of charitable contributions in the 1980s was as a deduction from taxable income, the subsidy rate for the first euro of contributions was equal to the marginal tax rate τ faced by taxpayers and the price of giving was equal to $(1-\tau)$.[17] In a progressive tax system, higher income households, who tend to give more, also face lower prices of giving than lower income households. Moreover, households who experience transitory changes in income have an incentive to plan the timing of their contributions in order to maximize their tax deductions. A failure to control properly for income might yield to biased estimates of the elasticity of the price of giving. We address this identification problem by exploiting variations in the price of giving that come from specificities of the French tax law and are exogenous to households' income.

More precisely, we implement two complementary strategies to identify elasticities of reported contributions in each time period. The main strategy uses nonlinearities in the income tax schedule faced by households, due to the system of family income splitting in France (*système du Quotient Familial*). The second strategy uses variations in the price of giving created by the existence of a specific subsidy cap for a particular type of contributions.

Main estimation strategy

In our baseline estimation strategy, we follow the empirical literature on tax incentives for charitable contributions and use a log-log regression model to estimate the change in reported elasticities before and after the reform:

$$\log Y_i = \varepsilon_1 \log(1-\tau_i) \cdot \mathbb{1}[\text{Before } 1983] + \varepsilon_2 \log(1-\tau_i) \cdot \mathbb{1}[\text{After } 1983] + X_i'\beta + \omega_i \tag{6}$$

where $log(Y_i)$ is the logarithm of reported contributions (plus one) and $\log(1-\tau_i)$ is the logarithm of the price of contributions. In order to estimate separately the price elasticity of reported contributions before the tax enforcement reform (ε_1) from the tax elasticity after the reform (ε_2),

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[17] Contrary to the US, where only itemizers can deduct their gifts, the tax deduction was available to all taxpayers, and there was no specific treatment for in-kind donations or gifts of capital gains property at the time in France

we add an interaction term between the logarithm of reported contributions and dummies for the pre- and post-reform years (1975 and 1979 versus 1984 and 1988).

To properly estimate the two elasticity parameters ε_1 and ε_2, we need to control for the endogeneity of variations in the price of giving that arise because of the mechanical correlation between income and price. We take advantage of the existence of the French system of family income splitting, called *Quotient Familial* (QF), which creates variations in the price of giving that are not directly correlated with income. The principle is as follows. Total income tax is computed as $n \cdot T(\frac{z}{n})$, where z is 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 $\tau = T'(z/n)$. At any given level of income, τ varies with the number n 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 3. The Figure also shows that the exogenous changes in the price of giving created by the QF system span over a broad income range. We exploit these nonlinearities to identify the causal effect of the price of giving on reported contributions. In practice, we introduce income decile dummies in the regression equation to control nonparametrically for income,[18] and a full set of marital status and number of children dummies to control flexibly for family size. Our identification comes from the functioning of the family income splitting system, as it relies on the comparison of groups of households who belong to the same income group, but face a different price of giving according to their number of QF units. Our specification is estimated using the four cross sections of taxpayers' files pooled together. We therefore interact all our control variables with year fixed effects. This allows us to control in a very flexible way for potential differential trends in the evolution of charitable giving by family composition or income group.

In addition to the controls for income and family size, we also need to take into account the endogeneity of the price of charitable giving with the level of contributions. The endogeneity comes from the fact the deduction of large contributions is likely to change the marginal tax rate faced by taxpayers. To address this problem, we adopt a standard method in the literature of charitable giving, which is to instrument the actual logarithm of the price of giving $log(1-\tau)$ by the logarithm of the price of giving that each taxpayer would face for the first euro of contribution.

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[18] Taxable income is computed not taking into account the charitable deduction.

Finally, as a robustness check, we also instrument the logarithm of the price of giving by a full set of dummies for all QF groups interacted with a set of 20 reported income group dummies. In this last specification, we therefore make sure that we only exploit variations in price that come from the functioning of the family income splitting system.

Figure 4 gives a graphical idea of our identification technique. We focus on two groups: taxpayers with 1 unit of QF (single individuals) and taxpayers with 4 units of QF (married couples with three children). Figure 4 displays the evolution of reported contributions against the logarithm of disposable income for these two groups, in 1979 and 1984. The upper graph, for 1979, shows that the differences in the evolution of contributions between the two groups follows closely the differences in the evolution of price. At low levels of income, the price of contributions is high for both groups, and reported contributions are almost zero for both groups. As income starts rising, contributions begin to rise for taxpayers with 1 unit of QF as they experience a decrease in their price of giving, whereas the logarithm of contributions remain close to zero for taxpayers with 4 units of QF, who still face a high price. At higher income levels, the price drops sharply for taxpayers with 4 units of QF and we observe that their contributions suddenly bridge the gap with the contributions of taxpayers with 1 unit of QF, whose price stays constant in this income range. The lower graph, for 1984, exhibits the same patterns, but the magnitude of the effects are much smaller. In the regression analysis below, we systematically exploit all the exogenous changes in the price of giving created by the QF system for all QF groups.

Before turning to the regression analysis, we give a final piece of graphical evidence in Figure 5 about our identification strategy and the change in the elasticity of reported contributions. The Figure is based on differences in group averages, which are constructed by residualizing the data with respect to both income group dummies and family size dummies. To do so, we run separate regressions of the data on family-size (QF groups) and 20 income-group dummies for log contributions, the y-axis variable, and log(net of tax rate), the x-axis variable. We then plot a “binned” scatterplot with these residualized data, using 40 quantiles. The difference in the correlation between residual log (price) and residual log (contributions) in 1979 and 1984 shows that the sensitivity of reported contributions to the price of giving is very different in the two periods. The coefficients of the fitted regression lines, which can be interpreted as a crude estimation of the elasticities of the price of giving, are equal to -2.97 in 1979 and $-.79$ in 1984. This suggests that the elasticity of reported contributions was very large before the tax enforcement reform, and dramatically decreased after

1983. These results are confirmed by the regression analysis presented below.

Regression results are displayed in Table 2. Column (1) presents OLS estimates where the only controls are time varying income group fixed-effects. The estimated price elasticity of reported contributions before the reform is three times as large as the elasticity after the reform and the difference is strongly statistically significant, with estimated coefficients for ε_1 and ε_2 equal respectively to -1.345 and -0.454. Results remain very similar when we instrument the logarithm of the price of giving by the logarithm of the price for the first euro of contributions (column (2)). As our estimation strategy relies on variations in the price of giving accross households with the same income but different family size, we next add a full set of non parametric controls for marital status and number of children, interacted with year dummies (column (3)), to account for any trend in giving that could vary by family type. The differences in the estimated elasticities before and after the reform become even larger, with estimates for ε_1 and ε_2 equal respectively to -1.737 and -0.342. The elasticity of reported contributions after 1983 is lower than most of the estimates from US data, which find elasticities betwen -0.7 and -1.3,[19] but it is in the same range of values than estimates on recent French data using different identification strategies (Fack and Landais [2010]). We perform additional robustness checks by controlling for differential effects of income across groups (column (4)) and instrumenting by the full set of income and family size dummies (column (5)). Results of the 2SLS specification show an even larger difference between the estimated elasticities before and after the reform.

In Table 3 we assess the sensitivity of our results to the use, as a dependent variable, of the logarithm of contributions plus one and perform several robustness checks to address the censoring problem in different ways. We first keep the log-log specification but use as an alternative dependent variable the logarithm of contributions plus 100 euros. Results are reported in Table 3 column (1) and (2). Coefficient estimates on $log(1-\tau)$ before and after 1983 clearly confirm a significant change in the relationship between contributions and the net-of-tax rate. Estimated elasticities ε_1 and ε_2 reported in column (1) and (2) of Table 3 are extremely similar to our baseline elasticities, confirming the robustness of our results to the choice of the constant in the dependent variable log(contributions + constant).[20] We also implemented specifications using $\log(max(g,100))$ as a

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[19] See Andreoni [2006] for a survey of the litterature, and in particular the papers by Auten et al. [2002] and Bakija and Heim [2011], which use log-log models.

[20] To recover elasticities of contributions with respect to the net of tax rate before the reform (ε_1) and after the reform (ε_2), we rescale the coefficient estimates in the regression by $1+c/\bar{g}$, where $c=100$ is the constant added to

dependent variable. Results are reported in columns (3) and (4) of Table 3. Once again, coefficient estimates on $log(1-\tau)$ before and after 1983 clearly confirm a significant change in the relationship between contributions and the net-of-tax rate. And once again, we can rescale these coefficient estimates to recover the elasticity of contribution, before and after the reform.[21] These estimates are again very similar to our baseline elasticities and to the elasticities in column (1) and (2) Table 3, confirming the robustness of our results to the definition of the dependent variable.

In column (5) of Table 3, we also investigated results from regressions on grouped data, where data is collapsed at the QF group × vigintile of income level for pre-reform and post-reform years, and the regression is weighted by the number of observations in each cell. This identification strategy is similar to that of Figure 5, except we now control for QF group fixed effects and vigintile of income fixed effects. Results confirm that the elasticity of contributions with respect to the net of tax rate was around -1.5 prior to the 1983 reform. After the reform, the elasticity of reported contributions decreased very significantly in magnitude so that $\varepsilon_2 = -0.211(0.31)$.

In appendix Table A.2, we also report results from parametric Tobit models and from an extensive margin model where we use the probability of giving (*i.e.* having strictly positive reported contributions) as the dependent variable in the regression. Results again confirm that the responsiveness of giving to the net-of-tax rate along the intensive and extensive margin decreased significantly after the reform.

Finally, in order to address the censoring due to the large number of taxpayers not reporting any positive contributions in a less restrictive way, we use a quantile regression approach. This also allows us to investigate the heterogeneity of the effect across the distribution of contributions. The censored quantile regression estimation technique has the advantage of being more flexible than parametric estimation techniques such as the Tobit model.[22] The basic intuition is that, even

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contributions, and $\bar{g}$ is the average contribution in the sample. The coefficient estimate is $\gamma = \frac{d\log(g+c)}{d\log(1-\tau)} = \frac{d(g+c)/(g+c)}{d\log(1-\tau)}$. And we are interested in $\varepsilon = \frac{d\log g}{d\log(1-\tau)} = \gamma \cdot (1 + c/g)$.

[21] To do so, note that our dependent variable $Y = \log(max(g, 100))$ can be rewritten: $Y = \log(100) \cdot (1-P) + \log(g) \cdot P$, where P is a dummy variable equal to one if contributions are larger than 100. This means that the coefficient estimates $\beta = \frac{dY}{d\log(1-\tau)}$ in regressions of columns (3) and (4) can be decomposed as: $\gamma = \varepsilon \cdot P + (\log(100) - \log(g)) \cdot \frac{\partial P}{\partial \log(1-\tau)}$. In other words, the effect of taxes on Y is the sum of an intensive response, conditional on contributing more than 100, and of the extensive response $\gamma_e = \frac{\partial P}{\partial \log(1-\tau)}$ on the probability to contribute more than a 100. We obtain an estimate of γ_e running regressions similar to our baseline specification using $P = \mathbb{1}(g > 100)$ as an outcome. From this we recover the estimate of $\hat{\varepsilon} = \frac{\hat{\beta} - \log(100/\bar{g})\hat{\gamma}_e}{\bar{P}}$ which are reported in column (3) and (4) of Table 3.

[22] Tobit estimates are available in the online appendix, as well as linear probability models where the dependent variable is having strictly positive contributions.

if many individuals do not give, the higher conditional quantiles of the distribution of gifts are unaffected by the censoring problem. 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). In order to estimate IV-censored quantile regressions, we implement a 3-step method *a la* Chernozhukov et al. [2012]. To explain how this method works, it is useful to start with the standard quantile regression model without censoring. A quantile regression model consists in expressing the quantile of the distribution of the dependent variable as a linear function of some covariates X. Here, our dependent variable is the level of contributions Y^*, and we can express the $q-th$ quantile of the distribution of contributions as:

$$Q_{Y^*|X}(q) = X'\beta(q)$$

Note that parameters β are different for each quantile of the distribution, and this is the reason why we index them by q. The model is estimated by minimizing a weighted average of the absolute value of residuals. Because of censoring of contributions at 0, we only observe $Y = Y^*$ if $Y^* > 0$ and $Y = 0$ if Y^* is censored. This yields the censored quantile regression model:

$$Q_{Y|X,C}(q) = max(X'\beta(q), 0) \tag{7}$$

The three-step method is an iterated algorithm that allows to estimate the model in a tractable way. It first selects a subset of observations for which the conditional quantile is in the observed part of the distribution, using a logit model. For these observations, an estimator of $\beta(q)$ can be computed by running an IV-quantile regression. The resulting estimates can be used to select a more refined subsample of uncensored observations, and compute again the IV-quantile regression. Results are displayed in Table 5 and show that the change in price elasticity is more pronounced at both ends of the distribution of contributions. The change in the elasticity of giving at the 99^{th} percentile is particularly striking, as it drops from -2.28 before the reform to -0.46 after the reform.

Heterogeneity

We investigate heterogeneous effects of the reform on the elasticity of reported contributions across taxpayers. As we explain in section 4, the change in the elasticity of reported contributions is a direct indication of the magnitude of the elasticity of overreporting contributions. The heterogeneity analysis conducted here gives us a first idea of the heterogeneity in the elasticity of overreporting contributions across taxpayers. We first investigate whether the drop in the elasticity of reported contributions observed on the entire sample after 1983 varies by income level. We divide our sample of taxpayers into two groups around the median income, and perform the same regression as in our main strategy, separately for each group. Results are displayed in Table 4 and show that the elasticity of reported contributions is larger for low income households before 1979 than for higher income households (-1.476 versus -0.921). Interestingly, it seems that the drop in the price elasticity of contributions after the reform is more pronounced for low income households.

We also compare the behaviour of individuals who only earn wage income to the behaviour of individuals who have some positive self-reported income in columns (3) and (4) of Table 4. Self-reported income include any form of income (self employment earnings, certain capital income, etc) that were not third-party reported to the tax administration at the time of the reform. Wage earners have very limited margins of evasion, whereas individuals who earn self reported income have other opportunities to evade, and it is interesting to see whose group is more reponsive to the change in tax enforcement. Results indeed suggest that the elasticity of reported contributions is much larger before the reform for individuals with wage income only, than for individuals with self reported income before the reform (-1.871 versus -1.080). The drop in the magnitude of the elasticity is also much more pronounced for taxpayers with wage income only. We show in section 4 that these differences can be translated into different elasticities of overreporting of charitable contributions, and provide some explanations for the observed heterogenity in behaviors.

We also perform the same heterogeneity analysis for IV-censored quantile estimator. Columns (2) and (3) in Table 5 show how the results restricting the sample to low income households (first half of the income distribution) and top income households (second half of the income distribution). The results confirm our earlier findings that the drop in the elasticity of reported contributions is larger for low-income households.

3.2 Bunching at the subsidy cap

Our second estimation strategy exploits the presence of a kink in the schedule of the tax subsidy for a certain kind of charitable contribution. This second estimation strategy provides a more local estimation of the price elasticity of charitable contributions than the main strategy. In the French tax system, contributions to charities called *associations d'intéret général*[23] are eligible to the deduction from taxable income only up to a cap of 1% of taxable income.[24] In practice, this creates a kink in the budget set, as the marginal price of contributions jumps up from $(1-\tau_i)$ to 1 (where τ_i is the marginal tax rate faced by the taxpayer) for contributions above 1% of taxable income.[25] Economic theory predicts that taxpayers will respond to such a jump in the marginal subsidy rate by bunching at the kink point. We follow Saez [2010] and use bunching to identify the compensated elasticity of reported contributions with respect to the price of contributions.

Figure 6 plots the empirical distribution of charitable contributions to *associations d'intéret général* as a fraction of taxable income before the reform (1975 and 1979) and after the reform (1984 and 1988). To control for extensive margin responses after the 1983 reform, which decreased the overall number of individuals reporting positive contributions to *associations d'intéret général*, we rescaled the distribution of contributions in 1984-1988 so that the fraction of individuals reporting positive contributions to these charities is equal before and after 1983. To avoid any substitution margin between regular charities and *associations d'intéret général*, we focus on taxpayers who only report contributions to this latter type of charity. Figure 6 shows that bunching at the subsidy kink point is substantially larger before the 1983 enforcement reform than afterward.[26]

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[23] Charities in France are mainly classified into two categories: associations *d'intéret général* and associations or fondations which are in addition recognized as *d'utilité publique*. In order to be considered as *d'intéret général*, the charity must be a non-profit organization pursuing general-interest objectives. The condition for being recognized as *d'utilité publique* are much stricter, with conditions on size, duration, scope and funding aimed at establishing that the organization is sustainable in the long run. Once an organization is granted such status by the ministry of Home Affairs, it enjoys a more favorable tax treatment, and can in particular receive bequests, whereas associations *associations d'intéret général* can only receive gifts.

[24] The tax deductions for gifts to other charities were also limited by a cap, but it changed several times over the period of study and as a result, increased very significantly. We focus on *associations d'intéret général* because the cap for this type of contribution remained stable over the entire period, and this allows us to precisely interpret the changes around the cap over time.

[25] The taxable income definition used by the tax administration to compute the cap is taxable income excluding any deduction for charitable contributions. We use the same definition to compute empirical distribution of contributions as a fraction of taxable income in Figure 6.

[26] To estimate the excess mass of contributions at the kink, we estimate a counterfactual distribution using a polynomial of order 5 and excluding contributions in the 0.9% to 1.1% range. Because of potential extensive margin responses in the presence of reporting effects, it is unclear whether the excess mass is only coming from above the

The excess mass at the kink point estimated against our counterfactual distribution is 2.5 before the reform, meaning that there is an excess number of individuals at the kink point equal to 2.5 times the number of individuals in the estimated counterfactual distribution. After the reform, this excess mass is divided by more than 5, and drops to 0.44.

In Figure 7 we provide additional evidence that excess bunching at the 1% cap is not due to some lack of smoothness in the distribution of contributions, but indeed correlates with the size of the marginal subsidy variation at the kink. We again exploit variations in the marginal tax rate created by the QF system. We split the sample in income terciles×QF groups. In panel A, we display the distribution of contributions for the bottom tercile of income for different QF groups. Because of the QF system, taxpayers with one unit of QF face marginal tax rates of 21% on average in the bottom tercile of income, while taxpayers with four units of QF have a zero marginal tax rate in this tercile. We detect a significant excess mass at the cap for the distribution of contributions of taxpayers with one unit of QF, but the distribution of contributions for taxpayers with 4 units of QF exhibits no such excess mass at the cap. In panel B, we draw the same distributions for the top tercile of income. All QF groups now have strictly positive average marginal tax rates, ranging from 30 to 45 percent. We detect significant bunching for all QF groups, with the size of the spikes increasing in the marginal tax rate of the group. This evidence clearly indicates that bunching at the subsidy cap is due to a behavioural response in reaction to a change in marginal incentives at the cap.

We then use the bunching evidence to estimate elasticities of reported contributions with respect to the price of contributions (*i.e.* one minus the marginal subsidy rate). The identifying assumption is that in the absence of the discontinuous drop in subsidy rate, there would have been no spike in the density distribution at the kink. Because marginal subsidy rates at the cap are heterogenous across taxpayers, we use, to compute the elasticity, the average change in the subsidy rate at the kink for all taxpayers contributing between 0.5 and 1.5 percent of their taxable income to *associations d'intéret général*. Our estimate of the bunching elasticity is -.282 (.01) before the reform and it drops to -.042 (.005) after the reform.[27] These results confirm the substantial drop in the elasticity of contributions already documented in the previous subsection. The very low baseline

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kink. We therefore do not follow the integration constraint procedure of Chetty et al. [2011] to adjust the counterfactual distribution.

[27] This drop in the magnitude of the bunching elasticity is somewhat larger than the drop in elasticities estimated from non-linearities in the QF system. This may reflect the fact that bunching is more sensitive to manipulation.

levels of these estimated elasticities is also a traditional feature of bunching elasticities and is a consequence of the various optimization frictions encountered by taxpayers in order to bunch precisely at the kink points (see for instance Kleven and Waseem [2013] for evidence of frictions in bunching at notch points in the income tax schedule). The elasticities obtained in the first strategy do not suffer from such important frictions and are therefore our preferred estimates.

Overall, the bunching strategy confirms that the 1983 reform induced a significant drop in the elasticity of reported contributions. Moreover the observation of a concentrated drop in contributions at one specific point of the distribution of gifts, rather than a decrease in contributions smoothly spread over the entire distribution, would be very difficult to explain with a change in actual giving behaviours. This specific pattern provides additional evidence that the change observed after 1983 is likely driven by tax optimization motives, rather than by a sudden decrease in generosity.

3.3 The impact of the enforcement reform on the elasticity of taxable income

Allowing for adjustments and deductions in the tax code has always raised the concern that such tax expenditures might be used to evade, avoid or minimize taxes instead of achieving their intended Pigouvian or redistributive role. In the abundant literature estimating taxable income elasticities it is in fact often argued that estimated elasticities mostly capture the active use of avoidance tools such as itemized deductions and adjustments rather than real labour supply responses in terms of hours or effort (Giertz et al. [2012]). This implies that tax enforcement changes or variations in the tax base will affect the elasticity of taxable income. Yet, there is almost no direct empirical evidence that enforcement or tax base reforms have direct effects on the elasticity of taxable income. This is due, first to the difficulty of credibly identifying the elasticity of taxable income, and second to the unavailability of tax base or tax enforcement reforms that would not at the same time affect real responses (such as labour supply).

We provide evidence that the 1983 reform was indeed associated with a decline in the elasticity of taxable income. To do so, we use the presence of kinks in the income tax schedule, as in Saez [2010]. We focus on the distribution of taxable income divided by the number n of QF units. This is the relevant income measure to consider because, as explained in section 3.1, due to the functioning of the QF system, the marginal tax rate is determined by this ratio z/n. The French income tax schedule at the time is characterized by a large number of small income tax brackets with systematic marginal tax rate increments of 5 percent, and marginal tax rates ranging from 5 to 60 percent.[28] The large number of brackets and the complexity of the QF system makes bunching relatively costly for taxpayers in the presence of frictions. This explains why studies focusing on more recent years have not found significant bunching at the kink schedules in France (see Carbonnier et al. [2013]. On the contrary, we show that before the 1983 reform, bunching at the kink points can clearly be detected. In Figure 8, we display the average yearly empirical distribution of taxable income divided by QF units centered at the nearest kink of the schedule, before and after the 1983 reform. We group all kinks together and show the average number of individuals in each bin. In panel A, we show the distribution before the 1983 reform. There is a clear spike in the density at the location of the kink in the tax schedule, associated with an estimated excess mass of .2 (.05). No such excess mass can be detected after the reform.[29]

Most interestingly, taxable income bunching at the kink points of the income tax schedule is correlated with the propensity to report positive contributions. We run a probit model of the probability of being located at the kink on a series of covariates including the fact of reporting strictly positive charitable contributions and where we cluster standard errors at the kink level. We report on Figure 8 the semi-elasticity of the probability of being at the kink with respect to reporting strictly positive charitable contributions (d[bunching / d[donor]). Before the reform, the fact of reporting positive contributions is associated with a 8% higher chance of being at the kink point, while no such correlation can be detected after the reform.[30]

The drop in the elasticity of taxable income is of course in line with the large drop in the elasticity of reported contributions that we have documented in section 3. But our results suggest that taxpayers were actively using overreporting of charitable contributions before 1983 as a way to adjust their taxable income, and bunch at the kink points of the tax schedule. They also suggest that the possibility of substitution across deductions from taxable income was limited after the 1983 reform and that taxpayers did not easily find such inexpensive ways to adjust their taxable

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[28] The tax schedules for 1975, 1979, 1984 and 1988 are reproduced in table A.4 in Appendix.

[29] While the point estimates are very different, we conducted formal tests of equality of excess mass before and after the reform and cannot reject equality at the 10% margin, due to the lack of precision of the estimates in post-reform years.

[30] Again, due to power limitations, the zero effect estimated after the reform is not precise enough to rule out equality of the correlation between being a donor and locating at the kink at the 10% margin before and after the reform.

income once the channel of overreporting charitable contributions was shut down. This can be explained by the relatively small number of income tax deductions available in the French tax code at the time, as shown in appendix Figure A.3.

4 The elasticity of overreporting contributions

Our results so far have provided evidence that the enforcement reform has affected the amount of misreporting of contributions and that it has affected the magnitude of the elasticity of reported contributions. We now investigate more precisely how it also affected the anatomy of the elasticity of reported contributions by trying to identify the magnitude of the elasticity of overreporting contributions. The larger the elasticity of overreporting contributions relative to the elasticity of true contributions, the more the elasticity of reported contributions will be driven by overreporting in the lax enforcement regime, and the larger the correction needed on the local optimal subsidy for a given elasticity of reported contributions in formula (5).

There is still very little robust evidence on the relationship between marginal tax rates and tax evasion/misreporting. The sign of the elasticity of non-compliance behaviours with respect to the net-of-tax rate is theoretically ambiguous, not just because of income effects, but because the substitution effect can be either positive or negative, depending on the structure of penalties, taxes, and detection probabilities. Empirical studies give mixed results (for recent literature reviews, see Slemrod and Yitzhaki [2002], Slemrod and Stephan [2007], and Slemrod and Weber [2012]), that prove to be very sensitive to the empirical specification, due to the lack of exogenous variation in tax rates. One exception is the study of randomized audits in Denmark by Kleven et al. [2011], which exploit kinks created by non-linear tax schedules to estimate the effect of the marginal tax rate on evasion. They compare bunching at the kink using pre-audit and post-audit data and find that the marginal tax rate has a relatively small effect on evasion. But their estimates of the taxable income elasticity are, as is often the case with bunching estimates, greatly attenuated by optimization frictions and it is therefore hard to interpret the magnitude of their estimate of the elasticity of tax evasion in a broader context. In this paper, we can estimate the change in the elasticity of reported contributions not only using bunching techniques, but also by exploiting cross-sectional variations in the net-of-tax rate created by the family income-splitting system in France. This enables us to get estimates that are less likely to be attenuated by the specific frictions associated with bunching.

4.1 A partial identification of the elasticity of overreported contributions

We show here how one can use the tax enforcement reform to partially identify the elasticity of overreporting charitable contributions. Our setting is in fact very close to that of Kleven et al. [2011], except that because of the lack of audit data, we cannot assume that the elasticity of reported contributions post-reform fully captures the elasticity of true contributions with respect to the price of giving. As we discussed in section 2.4, people may and actually do underreport their contributions after the 1983 reform, and therefore, the elasticity of reported contributions after the 1983 reform also captures part of the elasticity of underreporting with respect to the net-of-tax rate. If we denote by G^U the level of true contributions that is not reported to the tax administration, and by G_A^r the level of reported contributions after the reform, we have that $G_A^r = G - G^U$ where G is the level of true charitable contributions made to charities. Differentiating with respect to the net of tax rate $1-\tau$, we can express the elasticity of reported contributions after the reform as a weighted average of the elasticity of true contributions the elasticity of non-reported contributions:

$$\varepsilon_A^{G^r} = \frac{G}{G^r}\varepsilon - \frac{G^U}{G^r}\varepsilon^{G^U} \tag{8}$$

where $\varepsilon_A^{G^r} = \frac{\partial G^r}{\partial 1-\tau}\frac{1-\tau}{G^r} \leq 0$ is the elasticity of reported contributions after the reform, $\varepsilon = \frac{\partial G}{\partial 1-\tau}\frac{1-\tau}{G} \leq 0$ is the elasticity of true contributions and $\frac{\partial G^U}{\partial 1-\tau}\frac{1-\tau}{G^U} \geq 0$ is the elasticity of non reported contributions.

Our estimate of the elasticity of reported contribution after the reform is a biased estimate of the elasticity of true contribution, but as we have argued, the amount of underreporting is somewhat small, and we expect the bias to be relatively small too. Moreover, we can sign the bias introduced by underreporting and provide an upper bound on the absolute value of the elasticity of true contributions. The reason is that the sign of the uncompensated elasticity of underreporting is unambiguous, contrary to the elasticity of overreporting. The level of true contributions that is not reported to the tax administration, G^U, is expected to vary negatively with the marginal tax rate (and therefore positively with the net-of-tax rate): whether the cost of reporting is a utility cost or a monetary cost, the higher the marginal tax rate, the greater the subsidy and the greater the incentive to report one's contributions. Assuming that income effects are small, which is likely to be the case given the small size of reported contributions as a fraction of total income, the compensated elasticity of underreporting with respect to the net-of-tax rate ε^{G^U} is also going to be positive. This in turn has two important implications.

First, it implies that one can use the elasticity of reported contributions after the reform to get a lower bound on the elasticity of true contributions (and therefore an upper bound on the absolute value of this elasticity). Using the fact that $0 \leq \frac{G^r}{G} = 1 - \frac{G^U}{G} \leq 1$, and that $\varepsilon^{G^U} \geq 0$, we have that $0 \geq \varepsilon \geq \frac{G^r}{G}\varepsilon_A^{G^r}$, and therefore:[31]

$$|\varepsilon| \leq \frac{G^r}{G}|\varepsilon_A^{G^r}| \leq |\varepsilon_A^{G^r}| \tag{9}$$

The absolute value of the elasticity of reported contributions that we estimate after the reform is therefore an upper bound on the absolute value of the elasticity of true contributions.

The second implication is that the massive drop in the magnitude of the elasticity of reported contributions that we have documented after the 1983 reform is an additional evidence of the presence of overreporting of contributions before the reform. If there had been no overreporting of contributions before the reform, and all the the drop in contributions was entirely due to underreporting after the reform, then the absolute value of the elasticity of reported contributions with respect to the net-of-tax rate should have gone up, not down. This can be seen from equations (8) and (9). For any given negative correlation ε between the net-of-tax rate and contributions before the reform, the introduction of underreporting only increases the negative correlation between reported contributions and the net of tax rate since $G/G^r \geq 1$ and $-\frac{G^U}{G^r}\varepsilon^{G^U} \leq 0$.[32] The drop in the absolute value of the elasticity of contributions that we estimated after the reform is therefore a clear indication that the drop in reported contributions can only be accounted for by a significant level of overreporting before the reform.

Now that we have bounds on the value of the elasticity of true contributions, we can, as in Kleven et al. [2011] use the difference in estimated elasticities pre and post reform to partially identify the elasticity of overreporting before the reform.

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[31] Note that we assume here that income effects are small also for true contributions, so that the uncompensated elasticity of true contributions is negative. This is very likely to be the case given the small size of contributions as a fraction of total income. Studies estimating the price elasticity of charitable contributions have indeed always found it to be negative.

[32] The intuition is the following. For any given correlation between the net-of-tax rate and contributions before the reform, taxpayers with high net-of-tax rate (*i.e.* low marginal tax rate and therefore low incentives to report) would have decreased more their reported contributions, than taxpayers with low net-of-tax rate (*i.e.* high marginal tax rate and therefore high incentives to report), thus increasing the magnitude of the negative correlation between the net-of-tax rate and reported contributions.

Before the reform, contributions reported to the tax administration are the sum of true and overreported contributions G^O. Our estimated elasticity of reported contributions before the reform $\varepsilon_B^{G^r}$ is then a weighted average of the elasticity of true contributions and of the elasticity of overreporting ε^{G^O}:

$$\varepsilon_B^{G^r} = \alpha\varepsilon + (1-\alpha)\varepsilon^{G^O}$$

where α is the share of true contributions in total reported contributions before the reform.[33]

Using the bound on the elasticity of true contributions defined above, we have that :

$$\varepsilon^{G^O} \leq \frac{\varepsilon_B^{G^r} - \alpha\varepsilon_A^{G^r}}{1-\alpha}$$

4.2 Estimated upper bound of the elasticity of overreported contributions

We report in Table 6 the value of this upper bound $\overline{\varepsilon^{G^O}} = \frac{\varepsilon_B^{G^r} - \alpha\varepsilon_A^{G^r}}{1-\alpha}$ using our estimates of the elasticity of reported contributions before and after the reform and our estimate of the share of overreported contributions $1-\alpha$ before the reform. We use two values for the share of overreported contributions: our preferred estimate (.6) and the most conservative estimate (.375) obtained in section 2.4. We also use two specifications for the estimation of the elasticities of reported contributions: our preferred specification (column (4) of Table 2) and one with fewer controls (column (2) in Table 2). We report two values for the bound $\overline{\varepsilon^{G^O}}$. The first value is a conservative one, $\overline{\varepsilon^{G^O}} = \frac{\varepsilon_B^{G^r} - \alpha\varepsilon_A^{G^r}}{1-\alpha}$ where we use a conservative upper bound on the elasticity of true contributions after the 1983 reform: $\varepsilon \geq \varepsilon_A^{G^r}$. The second value corresponds to a tighter bound $\overline{\varepsilon^{G^O}} = \frac{\varepsilon_B^{G^r} - \alpha \cdot \frac{G^r}{G}\varepsilon_A^{G^r}}{1-\alpha}$, where we use our estimates of underreporting after the reform and the fact that $\varepsilon \geq \frac{G^r}{G}\varepsilon_A^{G^r}$. In the baseline case we make the assumption that underreporting was close to zero before the reform, and that overreporting was also close to zero after the reform, which seems very likely given that the new system after 1983 is very close to perfect third-party reporting of contributions.

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[33] For simplicity, we have implicitly assumed that the elasticity of true contributions with respect to the net of subsidy rate $1-\tau$ was the same before and after the reform. This is equivalent to assuming that the enforcement technology p can affect the amount of true and misreported contributions, as well as the elasticity of total reported contributions but not the responsiveness of true contributions with respect to the net of tax rate. This need not be the case. Enforcement in the post-period is strong, so that the net-of-tax-rate is highly relevant for the actual amount of contributions; but in the pre-period, enforcement is weak, and so actual contributions may not depend at all on the net-of-tax-rate. According to this logic, it is likely that the elasticity of true contributions was, if anything, smaller prior to the reform. If this is the case, this means that the elasticity of overreported contributions before the reform would be even larger in magnitude than the lower bound we report.

Results are reported in panel A of Table 6 and show that the elasticity of overreported contributions is always inferior to -2. When we use the more conservative estimate for the fraction of overreported contributions before the reform (.375), this mechanically increases even more the elasticity of overreported contributions in absolute value. This is clear evidence that our estimates of a large elasticity of overreported contributions are not at all driven by the assumptions we make about the actual amount of overreporting before the reform. Our estimates of the bound is also very stable across the different specifications that we used to estimate the elasticity of reported contributions before and after the reform. In panel B of Table 6 we relax the assumption of zero underreporting before the reform and of zero overreporting after the reform. The bound is now equal to $\overline{\varepsilon^{G^O}} = \frac{\varepsilon_B^{G^r} - \varepsilon_A^{G^r} - \Delta\alpha\varepsilon_A^{G^r}}{\Delta\alpha^O}$ where $\Delta\alpha$ is the change in the share of true contributions in total reported contributions before and after the reform, and $\Delta\alpha^O$ is the change in the share of overreported contributions in total reported contributions before and after the reform. This adjustment does not affect the results qualitatively, and confirms that the elasticity of overreported contributions with respect to price is large and inferior to -2.

These results suggest that the elasticity of non-compliance with respect to the net-of-tax rate can be substantial, especially when tax enforcement is very lax and when there is no third-party reporting. Our results contrast with Kleven et al. [2011], but the reason is straightforward. In their study, they can only identify the elasticity of taxable income pre and post audit using bunching techniques. Since bunching estimates are greatly attenuated by frictions, they find a significant difference in the elasticities pre and post audits, but the levels of these estimates are so small that they translate into a very small elasticity of non-compliance. Contrary to their study, we can, on top of bunching techniques, also credibly identify the elasticity of reported contributions pre and post enforcement using plausibly exogenous variations in the net-of-tax rate due to the QF system. Because these estimates are not subject to the attenuation frictions of bunching estimates, our estimate of the non-compliance elasticity is much larger.

In appendix Table A.3, we also briefly investigate the heterogeneity in overreporting elascities across taxpayers. Our results suggest that the elasticity of overreporting with respect to the net of tax rate is likely to be significantly larger for low income taxpayers than for high income taxpayers. Our results also suggest that the elasticity of overreported contributions is larger for taxpayers with only wage income (and therefore with income that is almost fully third-party reported) than for individuals with at least some self reported income before the reform. This confirms that individuals who have other margins of tax evasion seem to abstain from overreporting charitable contributions, while for taxpayers with little other opportunities to evade taxes, the low enforcement of the charitable deduction was an easy way to adjust one's taxable income.

5 Conclusions and policy implications

This paper provides evidence that a simple change in the filing requirements for the French charitable deduction triggered a 75% drop in reported charitable contributions. We show that this drop can be credibly attributed to a change in the taxpayers' reporting practices, rather than to a real change in giving behaviours and that a very large fraction of this drop was caused by overreporting of charitable contributions before the reform. The fraction of overreported contributions in the lax enforcement regime before the reform was, even in the more conservative scenario, close to 40%, and probably around 60%, according to our preferred estimates. We demonstrate, using two different identification strategies, that the reform was clearly associated with a substantial decline in the absolute value of the price elasticity of reported contributions. We also provide clear evidence that before the reform, there was significant bunching of taxpayers at kink-points of the tax schedule and that bunching was correlated with the propensity of reporting positive contributions, while after the reform, no such bunching can be detected at the kink points of the tax schedule. Finally, we show that one can use our estimates of the elasticity of reported contributions before and after the reform to provide bounds on the elasticity of overreported contributions. Our results suggest that the elasticity of overreporting with respect to the net-of-tax rate was large and inferior to -2 before the reform.

These results first confirm that tax cheating or tax evasion on non third-party reported items can be substantial. Our findings suggest that, as argued by Kleven et al. [2011], the high level of income tax compliance in developed countries may therefore be essentially a consequence of the high level of third-party reporting rather than the result of some cultural norm of low evasion.

Our results also demonstrate that tax non-compliance can be very elastic to the net-of-tax rate. Until now, evidence on the sign and magnitude of the elasticity of non-compliance was very limited, due mostly to a lack of credibly exogenous variations in tax rates. Kleven et al. [2011] find a significantly negative elasticity of non-compliance with respect to the net-of-tax rate but the magnitude of their estimated elasticity is small, due to their bunching identification strategy, which also captures a lot of optimization frictions. Interestingly, our ability to identify the elasticity of reported contributions not only using bunching techniques, but also by exploiting the non-linearities created by the QF system, enables us to get a credible bound on the elasticity of non-compliance that is not attenuated by the specific frictions associated with bunching estimates.

Most importantly, our results confirm that tax elasticities are sensitive to variations in other policy instruments available to tax authorities. In our context, the policy instrument is the level of enforcement of a particular income tax deduction. But many other policy instruments, such as the level of information provided to taxpayers for instance, are also susceptible to affect these tax elasticities. In our case, the drop in the elasticity of reported contributions is driven by the large elasticity of non-compliance, and the large response of compliance to the tax enforcement reform. An important consequence of the large non-compliance elasticities on non third-party reported items is that they may critically affect the elasticity of the tax base with respect to the net-of-tax rate. We show that this is effectively the case, as evidenced by the drop in taxable income bunching at the kink points of the income tax schedule. Such robust evidence of a clear relationship between a large non-compliance elasticity on non third-party items and the taxable income elasticity is interesting because it is also consistent with the finding that the elasticity of taxable income is always much greater among the self-employed than among the wage earners.

A critical implication of the endogeneity of tax elasticities to other policy instruments is that recommendations based on calibrating optimal tax formulae with estimated tax elasticities may lead to misleading conclusions, when the other available policy instruments are not at set at their optimal levels. In the case of charitable contributions, evidence suggests that tax enforcement was not set optimally before the 1983 reform. The absence of third-party reporting was leading to substantial overreporting of charitable contributions and a very large elasticity of reported contributions with respect to the net-of-tax rate. Calibrating the formula of Saez [2004] for the optimal level of the charitable deduction using such a large elasticity of reported contributions, non recognizing that this elasticity was not set optimally, would have led to set the subsidy at an inefficiently high level.

Interestingly, despite the 2005 reform of filing requirements of charitable contributions, tax enforcement of private contributions is still considerably laxer in the United States than in other countries, such as France, that switched to a system very close to third-party reporting of contributions. From 2006 on, contributions must fulfill the following requirements. For cash contributions in excess of $250, the taxpayer must keep a receipt; for non-cash contributions of more than $500, the taxpayer must fill out and file IRS Form 8283. This new regime is still a lot laxer than the French regime 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. In this context, overreporting of small contributions is likely to remain significant in the US.

Overall, the evidence gathered in this paper shows that the elasticity of the various components of taxable income, and the elasticity of taxable income itself are sensitive to variations in other tax policy instruments, and in particular to the level of third-party reported information provided to the tax administration. As a consequence, most of the elasticities entering optimal tax formulae, and in particular the elasticity of taxable income should clearly be thought of, rather than as an immutable parameter, as an endogenous policy instrument that the government may want to adjust optimally, as in Kopczuk and Slemrod [2002].

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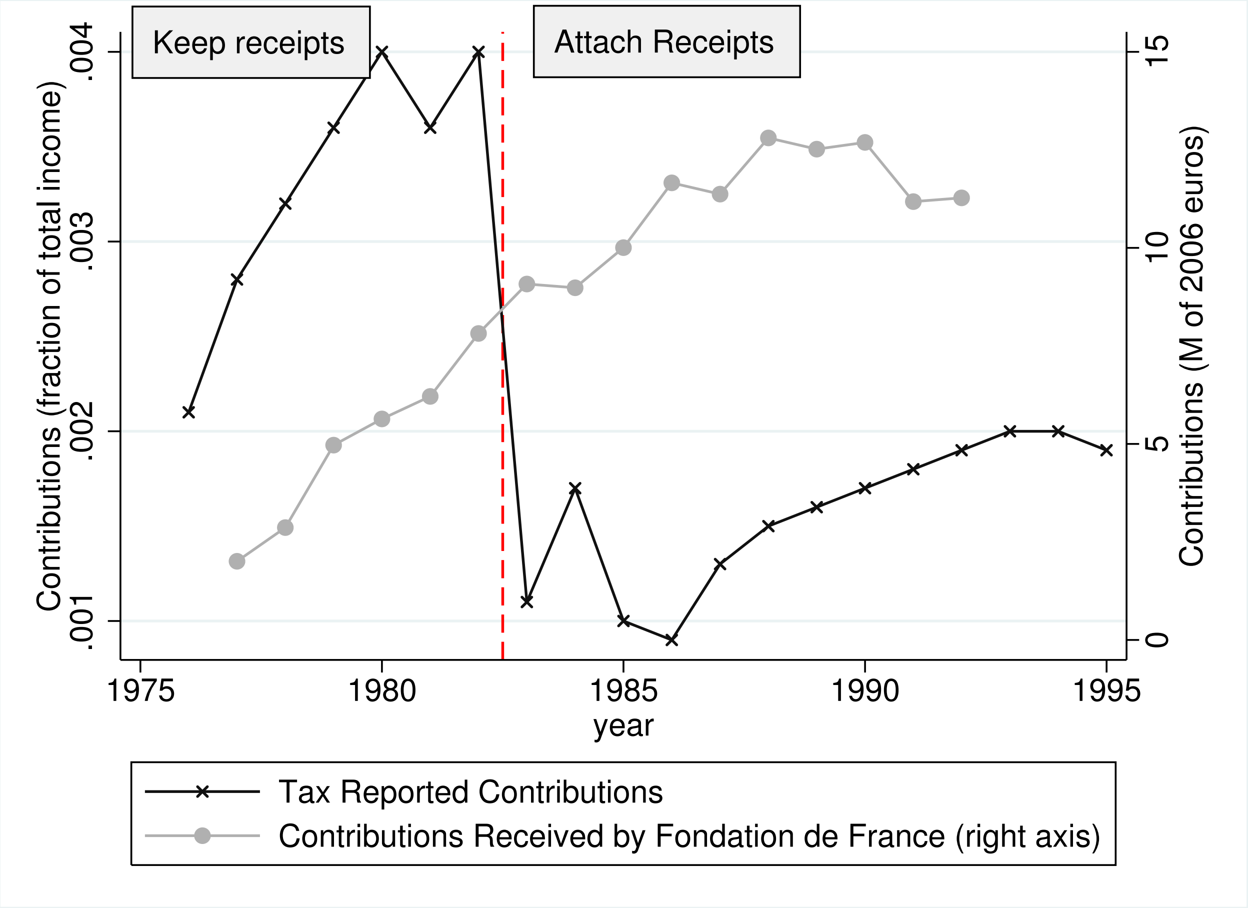
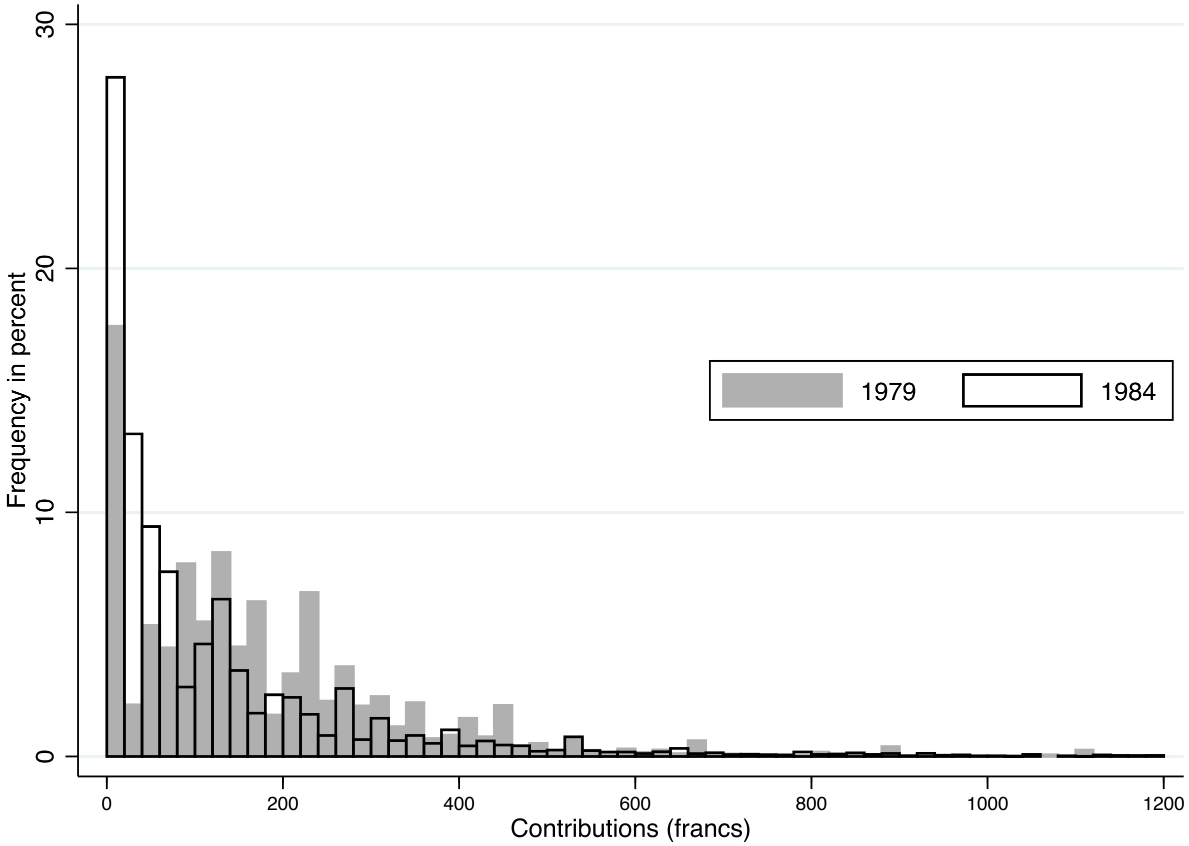
Figure 1: TAX-REPORTED CHARITABLE CONTRIBUTIONS, FRANCE (1976-2000)



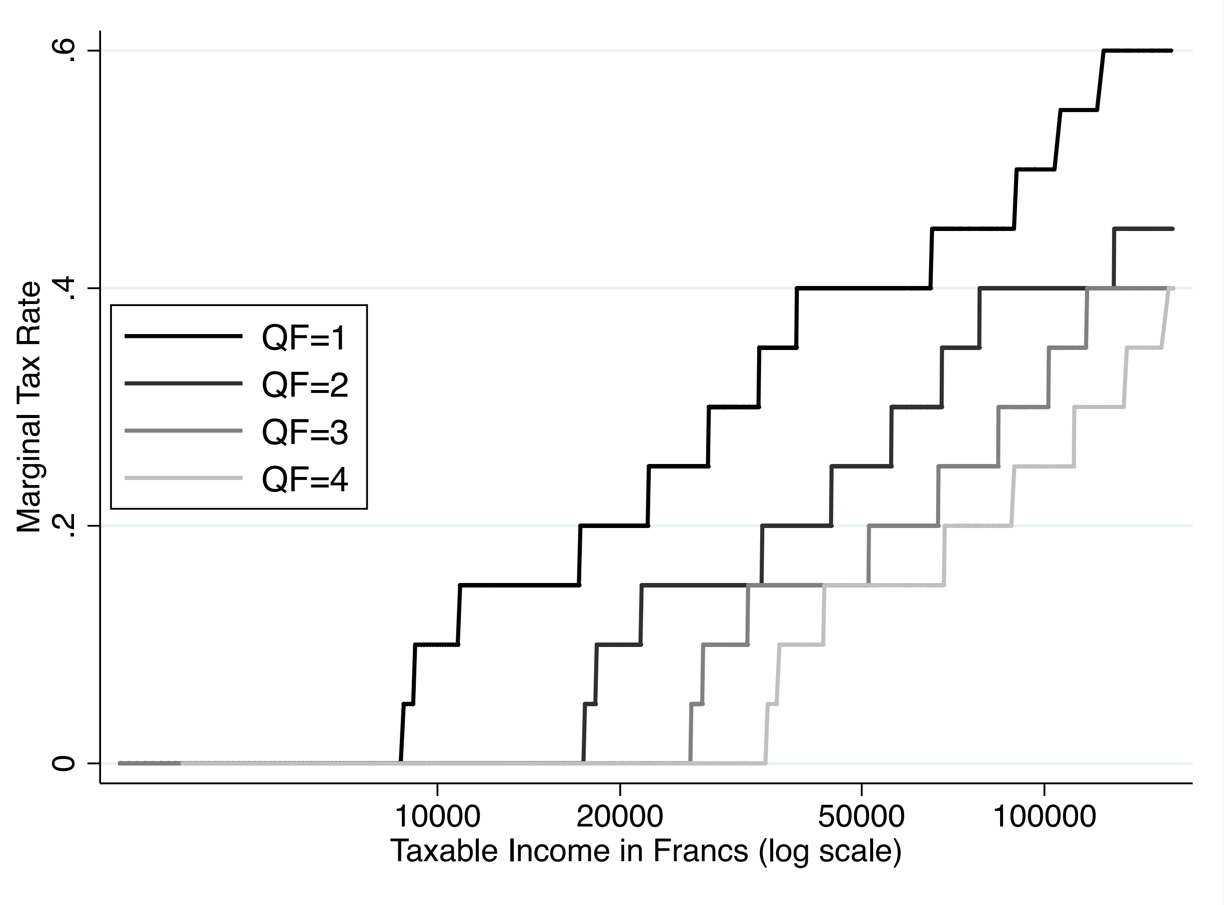
Notes: Tax-reported contributions are computed from exhaustive compilation of tax returns published by the French Tax administration (Etats 1921). Total income is total reported income before adjustments computed from the exhaustive compilation of tax returns. Before 1983, taxpayers were required to keep receipts of all the contributions claimed in their tax returns. In 1983, a reform required that taxpayers attach the receipts or a copy/proof of the receipt to their tax returns. After 1983, plotted reported contributions are contributions reported by taxpayers in their tax returns (and not the amounts indicated on receipts effectively sent).

Figure 2: DISTRIBUTION OF REPORTED CONTRIBUTIONS AMONG DONORS



Notes: Distribution of gifts among donors.
Source: Sample of taxpayers' returns drawn by the French tax administration in 1979 and 1984, restricted to taxpayers who report a positive gift (excluding the top 0.1% of gifts).

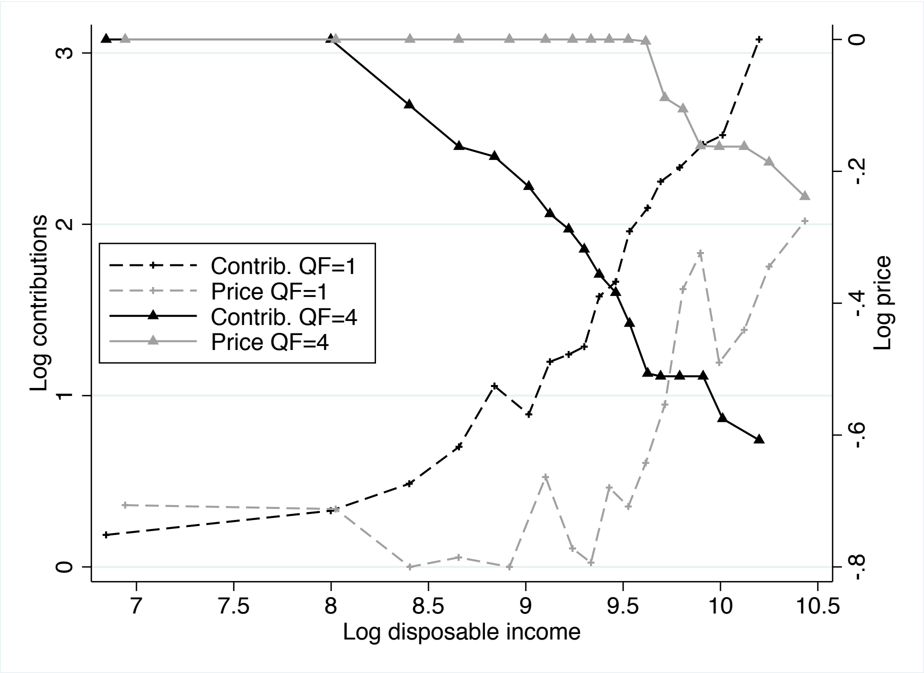
Figure 3: MARGINAL TAX RATE AS A FUNCTION OF TAXABLE INCOME FOR DIFFERENT GROUPS OF QF (1979)



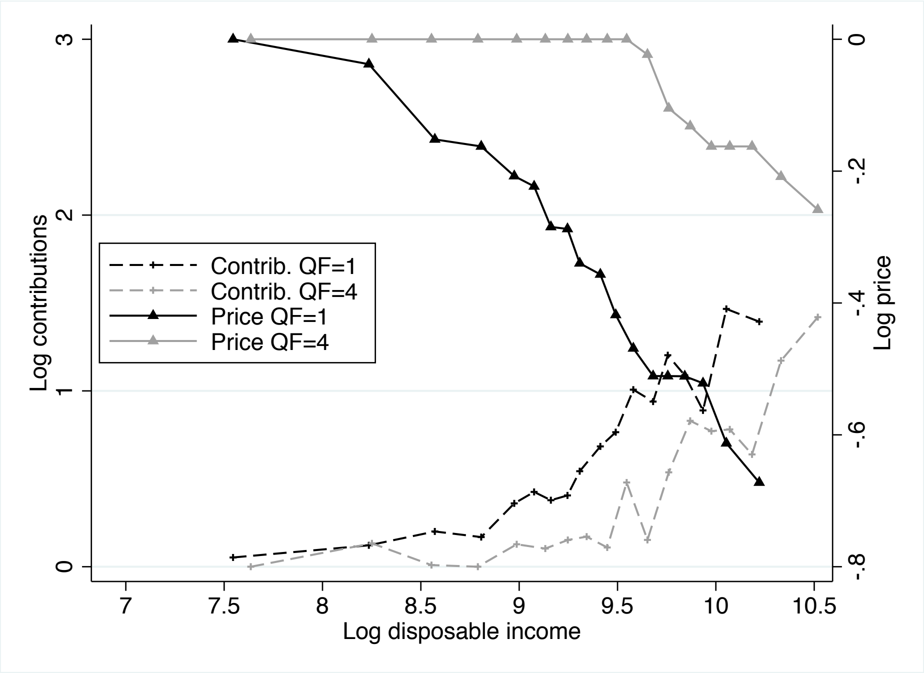
Note: Quotient familial (QF) is the name of the family income-splitting system in the French income tax system. Because the tax schedule applies to taxable income divided by the number of QF units of the household, this creates differences in marginal tax rates across taxpayers with the same level of taxable income but different number of QF units. Each line stands for a different QF group and plots the evolution of the marginal tax rate in 1979 against taxable income (with a logarithmic scale) for that QF group. The price of contributions is equal to 1 minus the marginal tax rate. Our identification strategy relies on the nonlinearities in price variations across QF×income groups created by the QF system.

Figure 4: Log Price of contributions and Log of Reported contributions as a function of log income for two QF groups

A. 1979

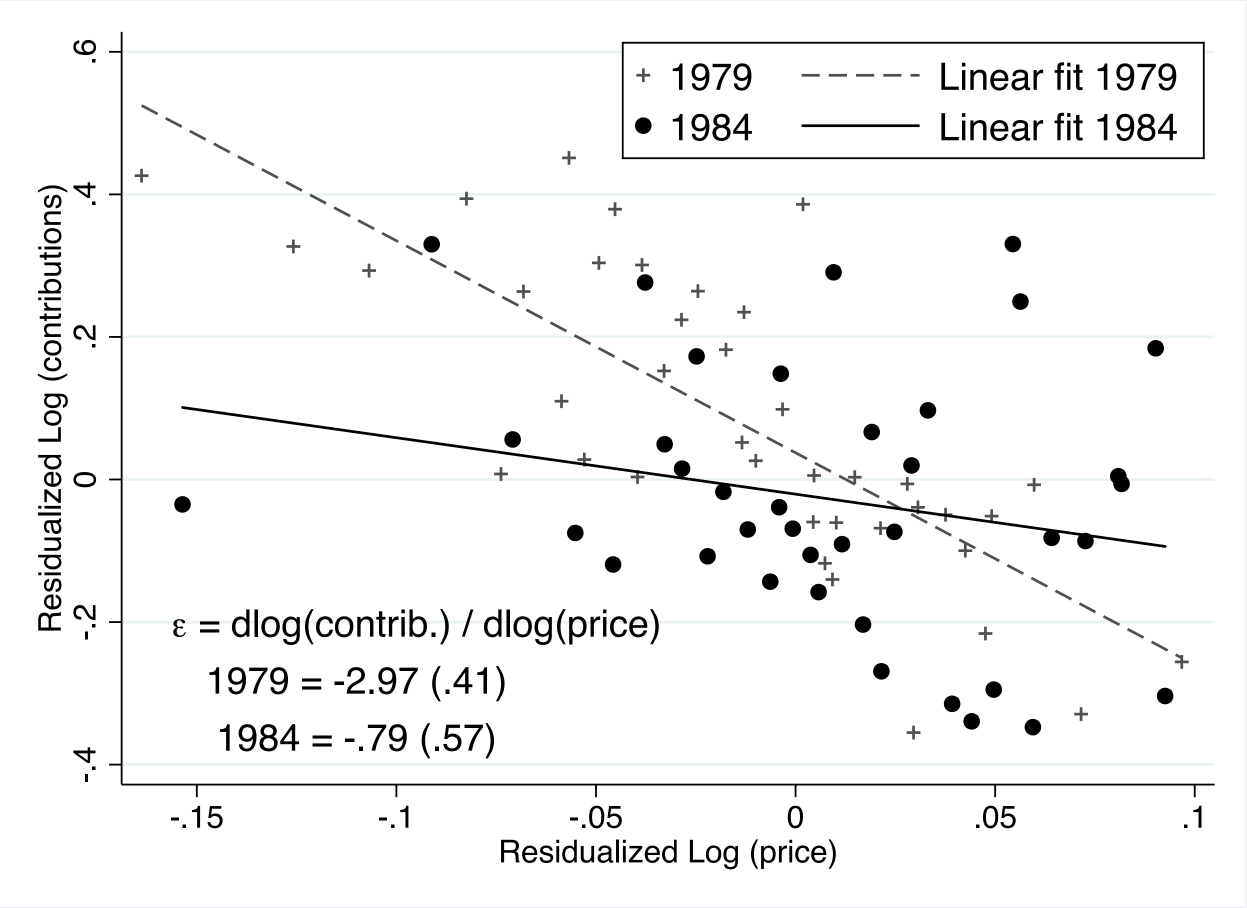


B. 1984



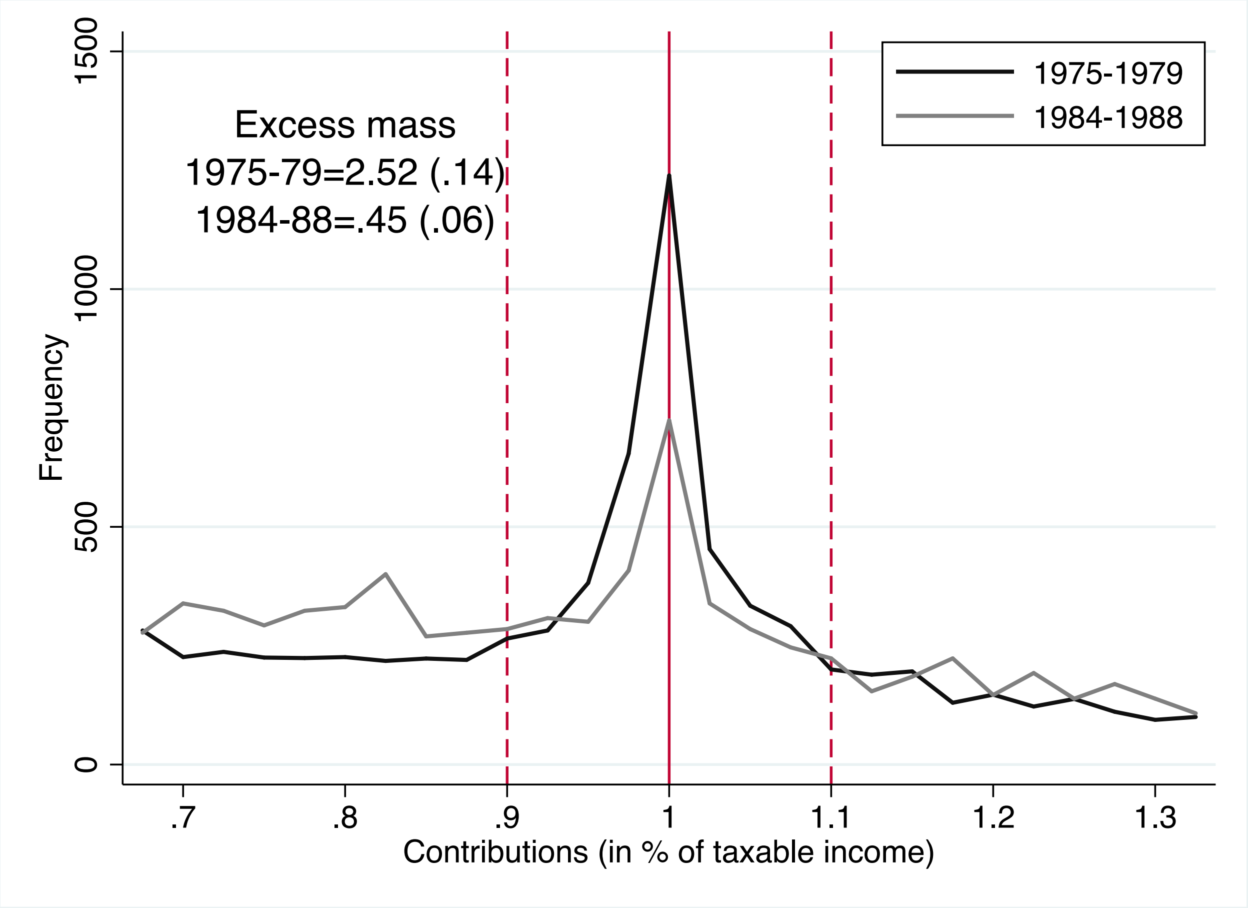
Note: The graph illustrates our main identification strategy for the estimation of the elasticity of contributions w.r.t. price, which consists in using the non-linearities in the tax schedule created by the functioning of the family tax-splitting system (QF). We plot, first, the evolution of the log price of contributions (right axis-plain lines) against the log of income for two different QF groups. Second, we plot the log of reported contributions (left axis-dashed lines) for the same two QF groups against log of income. The graph provides evidence that the non linearities in the price schedule due to the functioning of QF translate into different 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. The effect of the price of giving on reported contribution, is however, much larger in 1979 than in 1984.

Figure 5: A REGIME CHANGE IN PRICE ELASTICITY, FRANCE (1979 & 1984)



Note: This Figure represents graphically our identification strategy (using non-linearities in the price of contributions across income and QF groups) and the regime change in elasticity after the tax enforcement reform. We start by residualizing the data with respect to both income dummies and family size dummies. To do so, we run separate regressions of the data on family-size (QF groups) and 20 income-group dummies for log contributions (y-axis variable) and log(net of tax rate) (x-axis variable). We then plot a "binned" scatterplot with these residualized data, using 40 quantiles. The difference in the correlation between residual log (price) and residual log (contributions) in 1979 and 1984 shows that the sensitivity of reported contributions to the price of giving is very different in the two periods. The coefficients of the fitted regression lines, which can be interpreted as a crude estimation of the elasticities of the price of giving, are equal to -2.97 in 1979 and $-.79$ in 1984. This suggests that the elasticity of reported contributions was very large before the tax enforcement reform, and dramatically decreased after 1983.

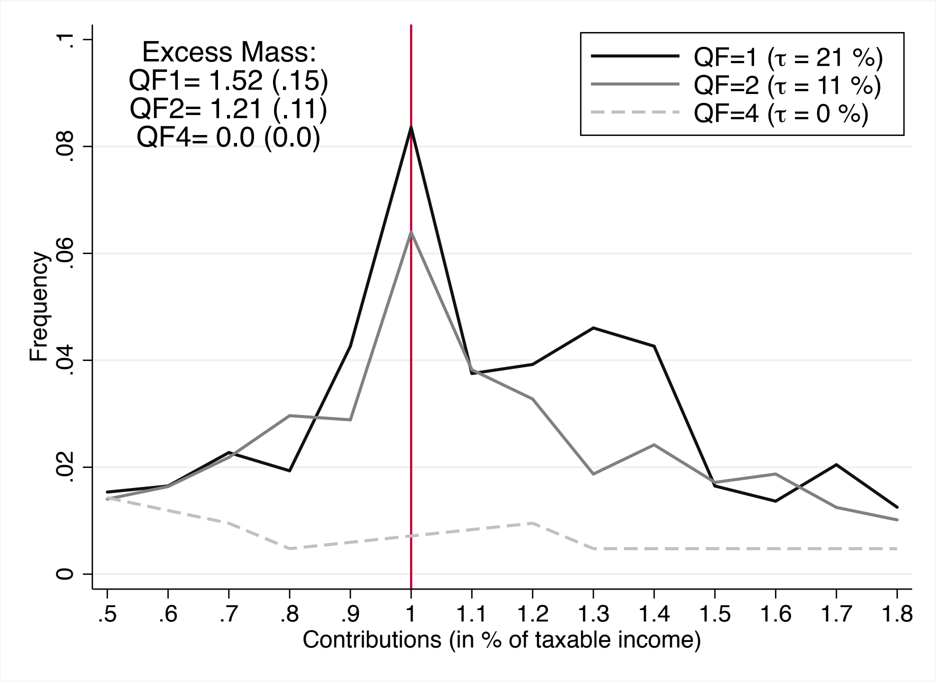
Figure 6: BUNCHING AT THE SUBSIDY CAP FOR CONTRIBUTIONS TO "ASSOCIATIONS D'INTERET GENERAL"



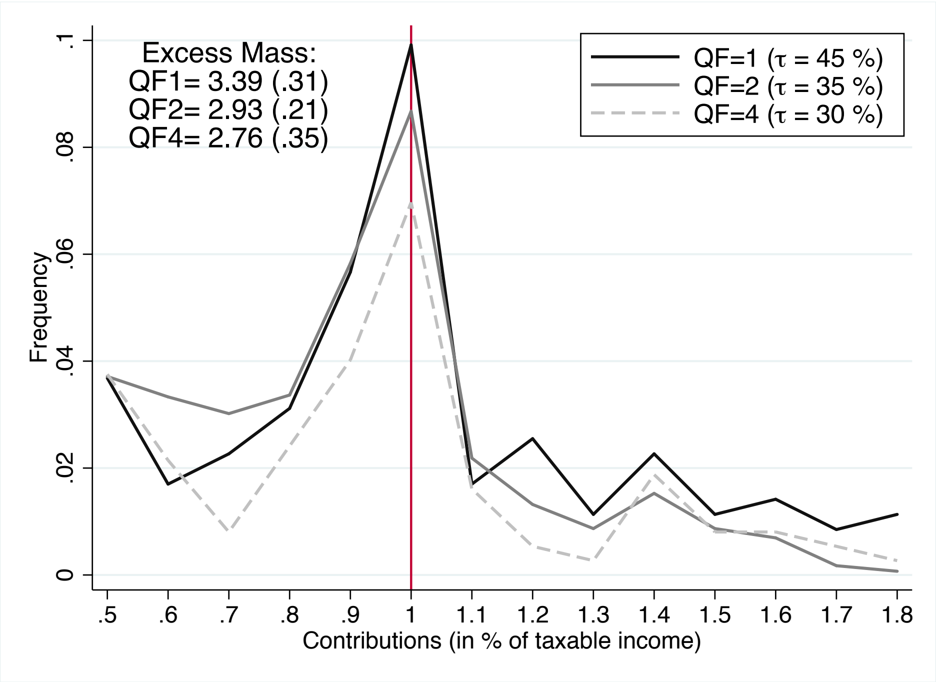
Note: The graph plots the average yearly empirical distribution of charitable contributions to associations d'interet general as a fraction of taxable income before the reform (1975 and 1979) and after the reform (1984 and 1988). Contributions to associations d'interet general are eligible to the deduction from taxable income only up to a cap of 1% of taxable income. We rescaled the distribution of contributions in 1984-1988 so that the fraction of individuals reporting positive contributions to associations d'interet general is equal before and after the 1983 reform. We focus on taxpayers who only report contributions to associations d'interet general. The excess mass at the kink point is estimated against a counterfactual distribution. We estimate our counterfactual distribution of contributions as a percentage of taxable income using a polynomial of order 5 and excluding contributions in the .9 to 1.1 range. Because of potential extensive margin responses in the presence of reporting effects, we do not follow the integration constraint procedure of Chetty et al. [2011] to adjust the counterfactual distribution. Standard errors are bootstrapped with 50 replications using a resampling strategy to account for specification errors in the counterfactual distribution.

Figure 7: Bunching at the subsidy cap for contributions to “associations d’interet general” by income×QF group (1979)

A. Bottom tercile of taxable income



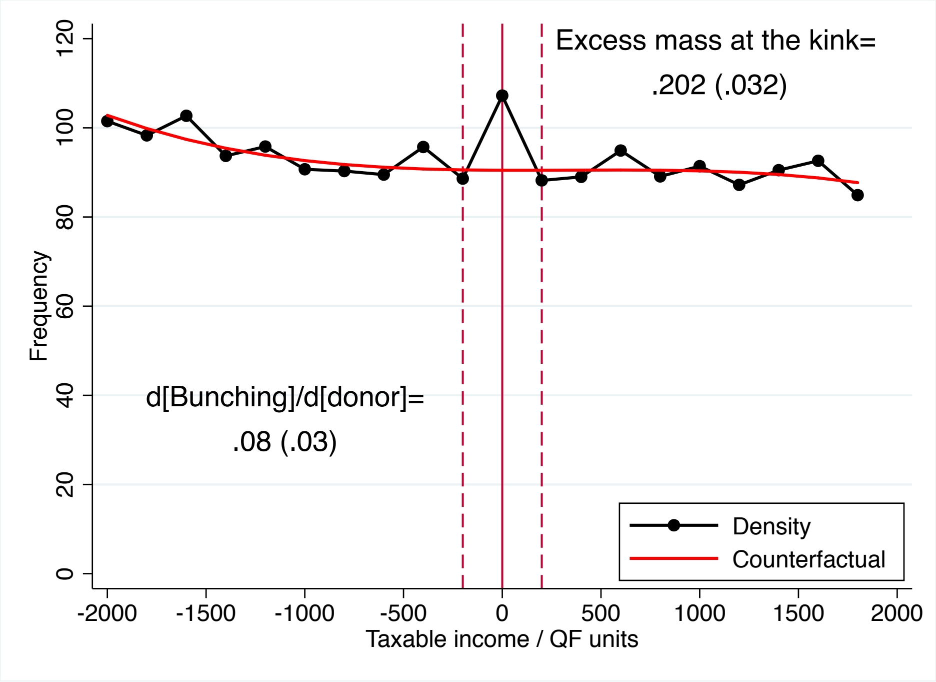
B. Top tercile of taxable income



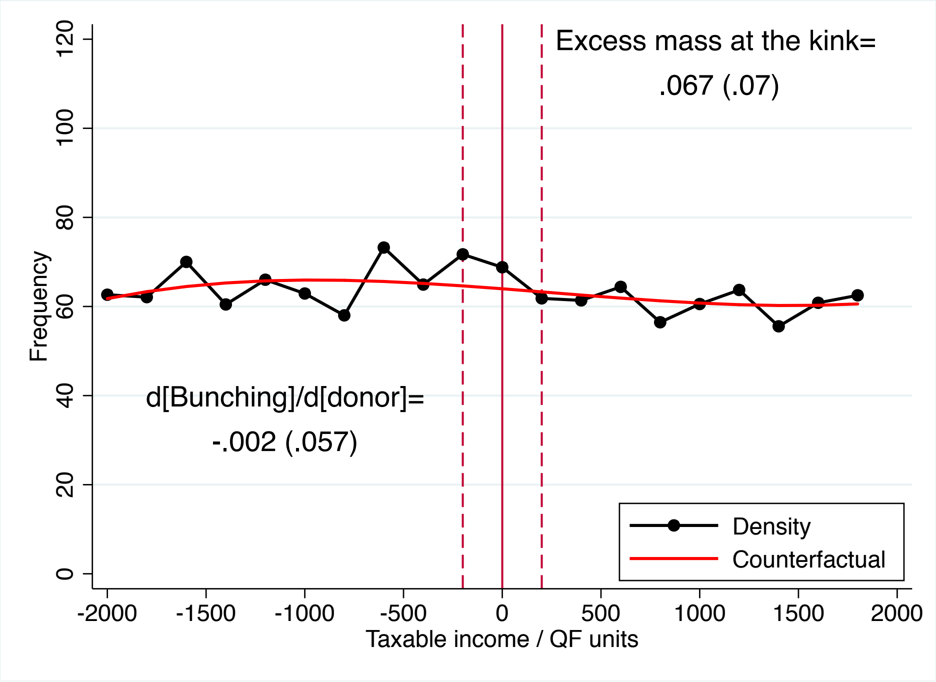
Note: The graph provides additional evidence that excess bunching at the 1% cap is not due to some lack of smoothness in the distribution of contributions, but correlates with the size of the marginal subsidy variation at the kink. We again exploit variations in the marginal tax rate created by the QF system. In panel A, we display the distribution of contributions for the bottom tercile of income for different QF groups in 1979. Because of the QF system, taxpayers with one unit of QF exhibit marginal tax rates (τ) of 21% on average, while taxpayers with four units of QF have a marginal tax rate of 0. We detect a significant excess mass at the cap for the distribution of contributions of taxpayers with one unit of QF, but the distribution of contributions for taxpayers with 4 units of QF exhibits no such excess mass at the cap. In panel B, we draw the same distributions for the top tercile of income, and detect significant bunching for all QF groups, with the size of the spikes increasing in the marginal tax rate of the group.

Figure 8: Taxable income bunching at the kinks in the income tax schedule

A. Before the reform



B. After the reform



Note: The graph plots the average yearly empirical distribution of taxable income (in Francs) divided by each taxpayer's number of QF units and centered at the nearest kink of the schedule, before and after the 1983 reform. All kinks in the schedule are pooled together. The excess mass at the kink point is estimated against a counterfactual distribution. We estimate the counterfactual distribution using a polynomial of order 3 and excluding individuals in the -200 to 200 range. Standard errors are bootstrapped with 50 replications using a resampling strategy to account for specification errors in the counterfactual distribution. We also run a probit model of the probability of being at the kink on a series of covariates including the fact of reporting strictly positive charitable contributions and where we cluster standard errors at the kink level. We report the semi-elasticity of the probability of being at the kink with respect to reporting strictly positive charitable contributions (d[bunching / d[donor]). Before the reform, the fact of reporting positive contributions is associated with a 8% higher chance of being at the kink point, while no such correlation can be detected after the reform.

Table 1: DESCRIPTIVE STATISTICS

Variables	(1) Before enforcement reform 1975-1979	(2) After enforcement reform 1984-1988
Marginal tax rate τ	.15	.17
	[.13]	[.13]
Log price of contributions	-.18	-.2
	[.16]	[.17]
Taxable income (2010 €)	15,890	17,549
	[23,317]	[23,998]
Reported contributions (2010 €)	41.15	17.66
	[148.64]	[180.75]
Reported contributions (conditional on giving) (2010 €)	207.99	192.85
	[277.42]	[568.31]
Fraction reporting contributions > 0	.20	.09
	[.4]	[.29]
Number of children	.67	.62
	[1.16]	[1.06]
Fraction married	.561	.51
	[.5]	[.5]
N	83766	94996

Source: Sample of taxpayers' returns drawn by the French tax administration: 1975, 1979, 1984, 1988.

Notes: Observations are at the tax return level and are weighted using sample weights. The Table reports weighted sample means of observable characteristics before the tax enforcement reform (1975-1979) and after the reform (1984-1988). Standard deviations are reported in between brackets.

Table 2: ESTIMATES OF PRICE ELASTICITY CHANGE IN FRANCE (1975-1979 VS 1984-1988). DEPENDENT VARIABLE: LOG OF REPORTED CONTRIBUTIONS

	(1) OLS	(2) 2SLS First €	(3) 2SLS First €	(4) 2SLS First €	(5) 2SLS Grouping
$\log(1-\tau) \times$ [Before 1983] (ε_1)	-1.345***	-1.589***	-1.737***	-2.061***	-2.671***
	(0.119)	(0.116)	(0.178)	(0.217)	(0.270)
$\log(1-\tau) \times$ [After 1983] (ε_2)	-0.454***	-0.569***	-0.342*	-0.353*	-0.202
	(0.119)	(0.119)	(0.171)	(0.178)	(0.224)
Year×income groups FE	YES	YES	YES	YES	YES
Year×marital status	NO	NO	YES	YES	YES
Year×# children FE	NO	NO	YES	YES	YES
Year×marital status×log(income)	NO	NO	NO	YES	YES
Year×# children FE ×log(income)	NO	NO	NO	YES	YES
Test $\varepsilon_1 = \varepsilon_2$					
Prob $> \chi^2$	0.00	0.00	0.00	0.00	0.00
N	134560	134560	134560	134560	134560
R^2	0.125	0.125	0.136	0.137	0.137

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Notes: Robust s.e. in parentheses clustered at the year×QF group×income group level. The Table presents estimates of models similar to that of specification (6). The sample includes all taxpayers below the 95th percentile of the income distribution. All models include controls for the logarithm of disposable income interacted with year fixed effects, income decile fixed effects, marital status fixed effects and number of children fixed effects. For each column, we report the elasticity of reported contributions with respect to the price of contributions before the 1983 reform (ε_1) and after the reform (ε_2). We also report the results of a test of equality of ε_1 and ε_2. In column (1), we estimate a simple OLS version of specification (6) where we control for 20 income groups fixed effects interacted with year. In column (2) to (4), in order to control for the endogeneity of the price of contributions with respect to the size of a taxpayer's contribution, we instrument the log price of giving by the log of price at the first euro of charitable contributions. In column (3) we interact the marital status and number of children fixed effects with year fixed effects. In column (4), to control for different profiles of contributions with respect to income across QF groups, we interact the logarithm of income with marital status × year fixed effects and with number of children × year fixed effects. In column (5), we use a grouping instrument for the log of price: we instrument the log of price by the average log of price in each taxpayer's income×QF group cell.

Table 3: PRICE ELASTICITY ESTIMATES: ROBUSTNESS ANALYSIS

	(1)	(2)	(3)	(4)	(5)
	2SLS	2SLS	2SLS	2SLS	2SLS
Dependent Variable	Log(gift+100)		Log(max(gift,100))		Grouped data
Coefficient estimates					
$\log(1-\tau) \times$ [Before 1983]	-0.446***	-0.524***	-0.348***	-0.410***	-1.540***
	(0.0420)	(0.0521)	(0.0395)	(0.0477)	(0.371)
$\log(1-\tau) \times$ [After 1983]	-0.104**	-0.0921*	-0.0936***	-0.0778**	-0.211
	(0.0360)	(0.0376)	(0.0266)	(0.0283)	(0.314)
Implied elasticities					
ε_1	-1.528	-1.797	-2.467	-2.875	
	(0.144)	(0.179)	(0.280)	(0.335)	
ε_2	-0.694	-0.613	-0.784	-0.679	
	(0.240)	(0.250)	(0.223)	(0.247)	
Controls					
Year×income groups FE	YES	YES	YES	YES	YES
Year×marital status	YES	YES	YES	YES	NO
Year×# children FE	YES	YES	YES	YES	NO
Year×marital status×log(income)	NO	YES	NO	YES	NO
Year×# children FE ×log(income)	NO	YES	NO	YES	NO
Test $\varepsilon_1 = \varepsilon_2$					
$Prob > \chi^2$	0.00	0.00	0.00	0.00	0.00
N	134560	134560	134560	134560	270
R^2	0.152	0.154	0.138	0.140	0.933

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Notes: Standard errors in parentheses, clustered at the year×QF group×income group level for columns (1) to (4). The sample includes all taxpayers below the 95th percentile of the income distribution. All models include controls for the logarithm of disposable income interacted with year fixed effects, income decile fixed effects, marital status fixed effects and number of children fixed effects. The dependent variable is log(gift+100) in columns (1) and (2) and log(max(gift, 100), in column (3) and (4). Column (5) presents cell-level results after collapsing the dataset into income group x family type x year cells, where the dependent variable is log(mean gift). In order to control for the endogeneity of the price of contributions with respect to the size of a taxpayer's contribution, we instrument the log price of giving by the log of price at the first euro of charitable contributions. In columns (1) and (3) we interact the marital status and number of children fixed effects with year fixed effects. In columns (2) and (4), to control for different profiles of contributions with respect to income across QF groups, we interact the logarithm of income with marital status × year fixed effects and with number of children × year fixed effects. Due to the construction of the dependent variable, in order to recover the elasticities of reported contributions with respect to the price of contributions before the 1983 reform (ε_1) and after the reform (ε_2) in columns (1) and (2), the estimated coefficients on $\log(1-\tau)$ must be multiplied by $1 + c/\bar{g}$, where $\bar{g}$ is the mean gift in the sample and $c = 100$ is the constant added to contributions. In column (3) and (4), the coefficients on $\log(1-\tau)$ must also be rescaled in order to obtain the elasticity of contributions with respect to the net of tax rate (see text for details). For each column, we report the results of a test of equality of the elasticities ε_1 and ε_2.

Table 4: HETEROGENEITY ANALYSIS OF PRICE ELASTICITY CHANGE IN FRANCE. DEPENDENT VARIABLE: LOG OF REPORTED CONTRIBUTIONS. (1979 VS 1984)

	(1) 2SLS Lower income households (P0-50)	(2) 2SLS Higher income households (P50-100)	(3) 2SLS Wage income only	(4) 2SLS Self-reported income
$\log(1-\tau) \times$ [Before 1983] (ε_1)	-1.476***	-0.921**	-1.871***	-1.080**
	(0.278)	(0.292)	(0.207)	(0.368)
$\log(1-\tau) \times$ [After 1983] (ε_2)	-0.433*	-0.511	-0.805***	-0.710
	(0.217)	(0.331)	(0.218)	(0.383)
Year×income groups FE	YES	YES	YES	YES
Year×marital status	YES	YES	YES	YES
Year×# children FE	YES	YES	YES	YES
Test $\varepsilon_1 = \varepsilon_2$				
Prob $> \chi^2$	0.00	0.35	0.00	0.49
N	41850	62948	82078	22720
R^2	0.06	0.09	0.13	0.09

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Notes: Robust s.e. in parentheses clustered at the year×QF group×income group level. The Table presents estimates of models similar to that of specification (6) for different subgroups of taxpayers. All models include controls for the logarithm of disposable income, 20 income groups fixed effects, marital status fixed effects and number of children fixed effects interacted with year fixed effects,. In all specifications, in order to control for the endogeneity of the price of contributions with respect to the size of a taxpayer's contribution, we instrument the log price of giving by the log of price at the first euro of charitable contributions. For each column, we report the elasticity of reported contributions with respect to the price of contributions before the 1983 reform (ε_1) and after the reform (ε_2). We also report the results of a test of equality of ε_1 and ε_2. In column (1) and (2), we split the sample according to income level. In column (3) and (4), we split the sample according to the main source of earnings of each taxpayer.

Table 5: IV-CQREG ESTIMATES OF PRICE ELASTICITY CHANGE IN FRANCE (1979 VS 1984)

	(1)	(2)	(3)	(4)
	IV-Censored quantile regressions			
	q=.75	q=.85	q=.95	q=.99
	A. Full sample			
$\log(1-\tau) \times$ [Before 1983] (ε_1)	-1.79***	-1.30***	-1.11***	-2.28***
	(0.04)	(0.02)	(0.01)	(0.01)
$\log(1-\tau) \times$ [After 1983] (ε_2)	.	-0.29***	-1.54***	-0.46***
	.	(0.04)	(0.02)	(0.03)
	B. Lower-income taxpayers (P0-P50)			
$\log(1-\tau) \times$ [Before 1983] (ε_1)	.	-5.26***	-1.95***	-2.83***
	.	(0.04)	(0.02)	(0.04)
$\log(1-\tau) \times$ [After 1983] (ε_2)	.	.	-0.82***	-0.39***
	.	.	(0.10)	(0.05)
	C. Higher-income taxpayers (P50-P100)			
$\log(1-\tau) \times$ [Before 1983] (ε_1)	-2.57***	-1.30***	-2.16***	-2.43***
	(0.06)	(0.01)	(0.01)	(0.01)
$\log(1-\tau) \times$ [After 1983] (ε_2)	.	-2.04***	-2.36***	-1.50***
	.	(0.05)	(0.02)	(0.03)
Year×income groups FE	YES	YES	YES	YES
Year×marital status	YES	YES	YES	YES
Year×# children FE	YES	YES	YES	YES

Notes: Robust s.e. in parentheses. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The Table presents estimates of models similar to that of specification (6) obtained using the 3-step algorithm for IV-Censored Quantile Regressions of Chernozhukov et al. [2012]. All regressions include controls for the logarithm of disposable income, 20 income groups fixed effects, marital status fixed effects and number of children fixed effects interacted with year fixed effects,. In order to control for the endogeneity of the price of contributions with respect to the size of a taxpayer's contribution, we instrument the log price of giving by the log of price at the first euro of charitable contributions. For each column, we report the elasticity of reported contributions with respect to the price of contributions before the 1983 reform (ε_1) and after the reform (ε_2). Between 10 and 25% of taxpayers report contributions depending on the covariates, so the conditional distribution of contributions is usually not defined below the 75th percentile.

Table 6: Upper bound estimates $\overline{\varepsilon^{GO}}$ on the elasticity of overreporting contributions with respect to the net-of-tax rate

(1)	(2)	(3)	(4)	(5)
Share of overreported contributions	Elasticity of reported contributions		Elasticity of overreported contributions	
Before 1983	Before 1983	After 1983		
$1-\alpha$	$\varepsilon_B^{G^r}$	$\varepsilon_A^{G^r}$	$\varepsilon^{GO} \leq \overline{\varepsilon^{GO}}$	
			Conservative bound	Tighter bound
A. Baseline: underreporting $\approx$ 0 before 1983				
.6	-1.86	-.36	-2.87	-2.98
	[.2]	[.17]	[.33]	[.33]
.375	-1.86	-.36	-4.11	-4.47
	[.2]	[.17]	[.5]	[.5]
.6	-1.59	-.57	-2.24	-2.38
	[.12]	[.12]	[.21]	[.21]
.375	-1.59	-.57	-3.27	-3.84
	[.12]	[.12]	[.31]	[.29]
B. Allowing for both underreporting before 1983 and overreporting after 1983				
.6	-1.86	-.36	-3.21	-3.37
	[.2]	[.17]	[.4]	[.41]
.375	-1.86	-.36	-5.1	-5.34
	[.2]	[.17]	[.68]	[.71]
.6	-1.59	-.57	-2.35	-2.57
	[.12]	[.12]	[.26]	[.27]
.375	-1.59	-.57	-3.56	-3.9
	[.12]	[.12]	[.44]	[.46]

Notes: The Table reports the value of the upper bound $\overline{\varepsilon^{GO}}$ on the elasticity of overreported contributions. We use two values for the share of overreported contributions: our preferred estimate (.6) and the most conservative estimate (.375) obtained in section 2.4. We use two specifications for the elasticities of reported contributions: column (4) and column (2) of Table 2. We report two values for the bound $\overline{\varepsilon^{GO}}$. A conservative one, where we use a conservative upper bound on the elasticity of true contributions after the 1983 reform. We also report a tighter bound where we use the tighter bound $\frac{G^r}{G}\varepsilon_A^{G^r}$ on the elasticity of true contributions after the 1983 reform. Standard errors are reported in between brackets. For $\overline{\varepsilon^{GO}}$ standard errors are bootstrapped with 50 replications using a bootstrapping stratified at the year× income group level. In panel A we make the assumption that underreporting was close to zero before the reform, and that overreporting was close to zero after the reform. In panel B, we relax the assumption and allow for both underreporting before the reform and overreporting after the reform.

APPENDIX - NOT FOR PUBLICATION

5.1 Proof of optimal subsidy formula (4)

To derive our optimal subsidy formula, we make important additional assumptions. First, we assume that the government can contribute directly to the public good. This direct contribution G^d greatly facilitates the treatment of the optimal subsidy problem as it allows the government to directly control the size of the externality generated by the public good. Note that these direct contributions can exert a crowding effect on private contributions $\bar{G}_{G^d} < 0$.

We also assume that earnings z 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.

We further 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.

We now give an intuitive proof of our optimal subsidy formula 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 $d\bar{G} + dG^d = 0$, 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 misreported contributions.

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

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: $du^i = -\nu^i_{1-\tau} d\tau = +(g+g^m)\nu^i_R d\tau$ We introduce the useful notation $\beta(\bar{G}^r) = \int \frac{\mu^i(g+g^m)\nu^i_R}{\lambda(\bar{G}+\bar{G^m})} d\nu(i)$, which is the

average social weight weighted by reported contributions. Integrating over i, we find the aggregate effect on individual's welfare:

$$B = \beta(\bar{G}^r)(\bar{G} + \bar{G}^m)d\tau$$

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

$$C = \tau(\frac{\bar{G}_{1-\tau}}{1+\bar{G}_{G^d}}d\tau + \bar{G}^m{}_{1-\tau}d\tau)$$

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

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

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:

$$-\frac{\alpha}{1+\bar{G}_{G^d}}\varepsilon_G + \frac{\tau(1-\alpha)}{1-\tau}\varepsilon_{G^m} = 1 - \beta(\bar{G}^r) \tag{10}$$

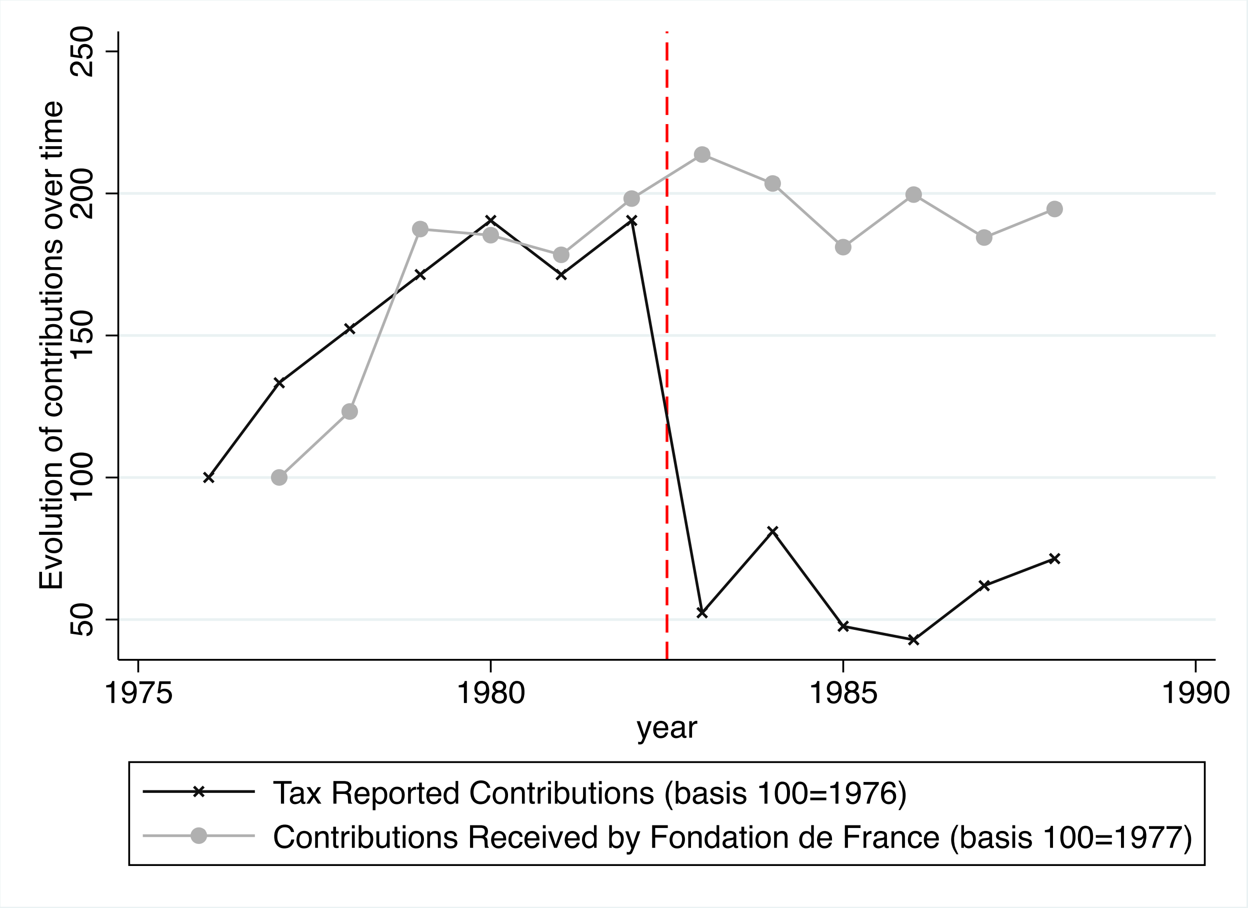
Optimal formula 4 is then obtained assuming crowding out effects are negligible $\bar{G}_{G^d} \approx 0$.

5.2 Heterogeneity analysis of overreporting elascities across taxpayers

In Table A.3, we also investigate the heterogeneity in overreporting elascities across taxpayers. In panel A and B, we report the value of the upper bound $\overline{\varepsilon^{GO}}$ on the elasticity of overreported contributions for low income and high income taxpayers using our estimates from the heterogeneity analysis in section 3.1. We compute the share of overreported contributions using the value of the drop in contributions for each category of taxpayers and under the assumption that underreporting after the reform is equal to 20%. Results indicate that the elasticity of overreporting with respect to the net of tax rate is significantly larger for low income taxpayers than for high income taxpayers. This suggests that cheating on one's charitable contributions, which is a "low-tech" type of tax cheating where one just increases the 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 avoidance behaviours, which might be available to higher income households. Moreover, these results might also reflect differential probability of audit by income level. High income taxpayers, who tend to have more self-reported income than lower income households, may have more opportunities to evade taxes, and therefore more to lose in the event of a tax audit. They might perceive the decision to falsely overreport charitable contributions as more risky, if they think that it increases the probability of audit.

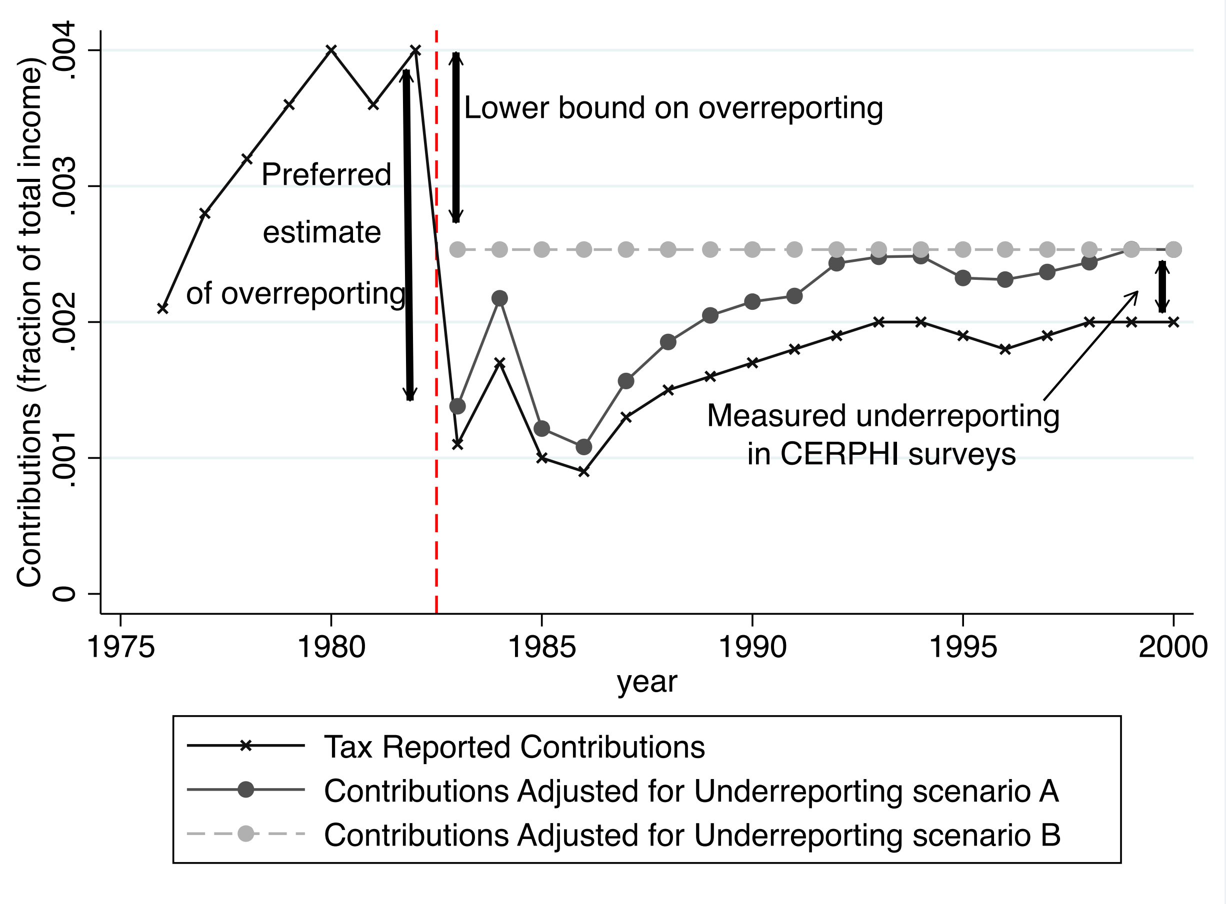
In panel C, we focus on taxpayers with wage income only, and in panel D, we look at taxpayers who report some positive self-reported income. Results indeed suggest that the elasticity of overreported contributions is larger for taxpayers with only wage income (and therefore with income that is almost fully third-party reported) than for individuals with at least some self reported income before the reform. This confirms that individuals who have other margins of tax evasion seem to abstain from cheating on charitable contributions, while for taxpayers with little other opportunities to evade taxes, the low enforcement of the charitable deduction was an easy way to adjust one's taxable income.

Figure A.1: EVOLUTION OF TAX-REPORTED CHARITABLE CONTRIBUTIONS & TOTAL CONTRIBUTIONS RECEIVED BY THE FONDATION DE FRANCE AS A FRACTION OF TOTAL INCOME



Notes: Tax-reported contributions are computed from exhaustive compilation of tax returns published by the French Tax administration (Etats 1921). Before 1983, taxpayers were required to keep receipts of all the contributions claimed in their tax returns. In 1983, a reform required that taxpayers attach the receipts or a copy/proof of the receipt to their tax returns. Contributions to the “Fondation de France” are computed from annual reports of the “Fondation de France”. The “Fondation de France” is an umbrella foundation collecting money for a large number of smaller foundations and associations. It is the largest non-profit organization in France. In 1979, contributions to the “Fondation de France” represented 7% of all contributions to foundations reported to the tax administration. Both series are divided by total reported income before adjustments computed from the exhaustive compilation of tax returns. Evolution of tax reported contributions has basis 100 in 1976 and the evolution of contributions to the Fondation de France has basis 100 in 1977. The Figure shows that trends are very comparable across both series, except for the break in the tax-reported series due to the 1983 reform.

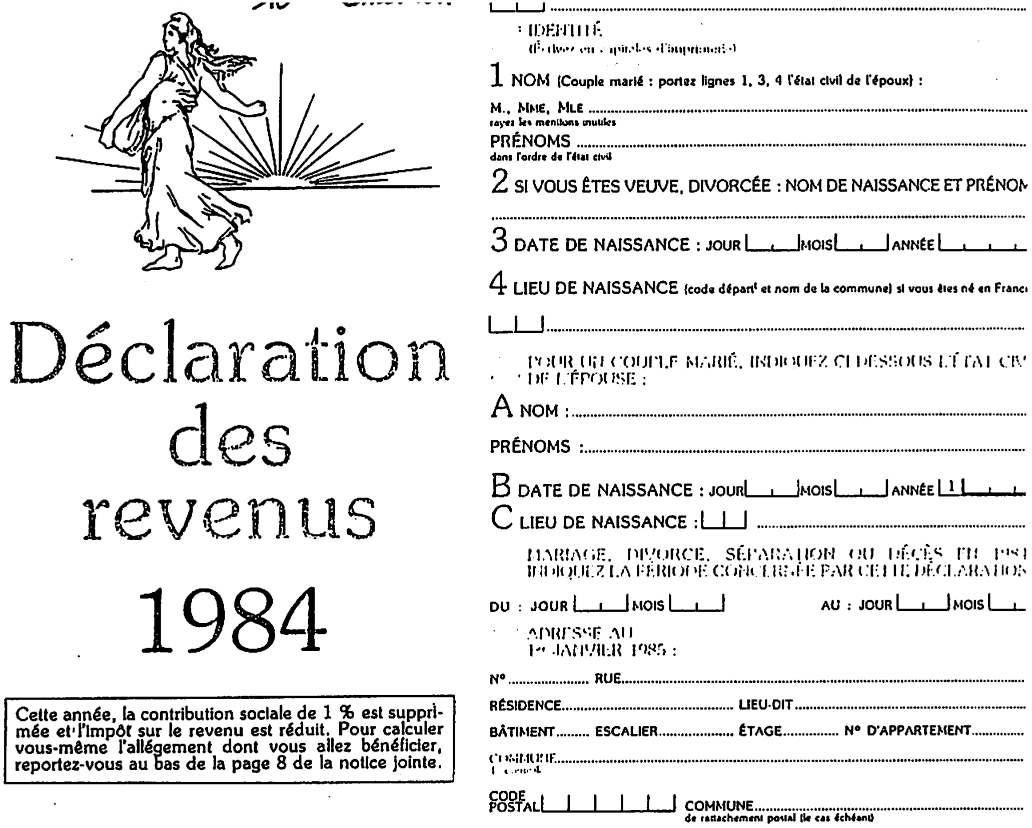
Figure A.2: TAX-REPORTED CONTRIBUTIONS & ADJUSTMENTS FOR UNDERREPORTING



Notes: Tax-reported contributions are computed from exhaustive compilation of tax returns published by the French Tax administration (Etats 1921). Total income is total reported income before adjustments computed from the exhaustive compilation of tax returns. We adjust reported contributions after 1983 in two different ways to take into account potential underreporting following the 1983 reform. In scenario A, we use actual estimates of underreporting obtained from surveys conducted by CERPHI from 2000 to 2004. These surveys sample actual donors and ask them whether they reported their contribution to the tax administration. The fraction of actual donors who reported their contributions to the tax administration is extremely stable and equal to 80% over the four surveys. Scenario A uses this average Figure of 80% to rescale reported contributions from 1984 to 2000. In scenario B, we make the extreme assumption that all the growth in contributions between 1984 and 2000 is attributable to increased reporting. This gives us a higher bound on the level of true contributions after 1983, and therefore a conservative lower bound on the amount of overreporting before 1983. We then compare the average level of contributions in years 1980 to 1982 to the average level of the rescaled contributions for scenario A and B in years 1983 to 1985. In scenario A, the overreporting accounts for 60% of total reported contributions before the reform. In scenario B, the overreporting accounts for 37.5% of reported contributions before the reform.

Figure A.3: PERSONAL INCOME TAX FORM FOR 1984

A. Front page



Déclaration des revenus 1984

Cette année, la contribution sociale de 1 % est supprimée et l'impôt sur le revenu est réduit. Pour calculer vous-même l'allégement dont vous allez bénéficier, reportez-vous au bas de la page 8 de la notice jointe.

IDENTITÉ
(Écrivez en capitales d'imprimerie)

1 NOM (Couple marié : portez lignes 1, 3, 4 l'état civil de l'époux) :

M., MME, MLE ……………………
rayez les mentions inutiles

PRÉNOMS ……………………
dans l'ordre de l'état civil

2 SI VOUS ÊTES VEUVE, DIVORCÉE : NOM DE NAISSANCE ET PRÉNOM

3 DATE DE NAISSANCE : JOUR ☐☐ MOIS ☐☐ ANNÉE ☐☐☐☐

4 LIEU DE NAISSANCE (code départ^t et nom de la commune) si vous êtes né en Franc

POUR UN COUPLE MARIÉ, INDIQUEZ CI-DESSOUS L'ÉTAT CIV
DE L'ÉPOUSE :

A NOM : ……………………

PRÉNOMS : ……………………

B DATE DE NAISSANCE : JOUR ☐☐ MOIS ☐☐ ANNÉE 1☐☐☐

C LIEU DE NAISSANCE : ☐☐ ……………………

MARIAGE, DIVORCE, SÉPARATION OU DÉCÈS EN 198
INDIQUEZ LA PÉRIODE CONCERNÉE PAR CETTE DÉCLARATION

DU : JOUR ☐☐ MOIS ☐☐ AU : JOUR ☐☐ MOIS ☐

ADRESSE AU
1er JANVIER 1985 :

N° ………… RUE ……………………

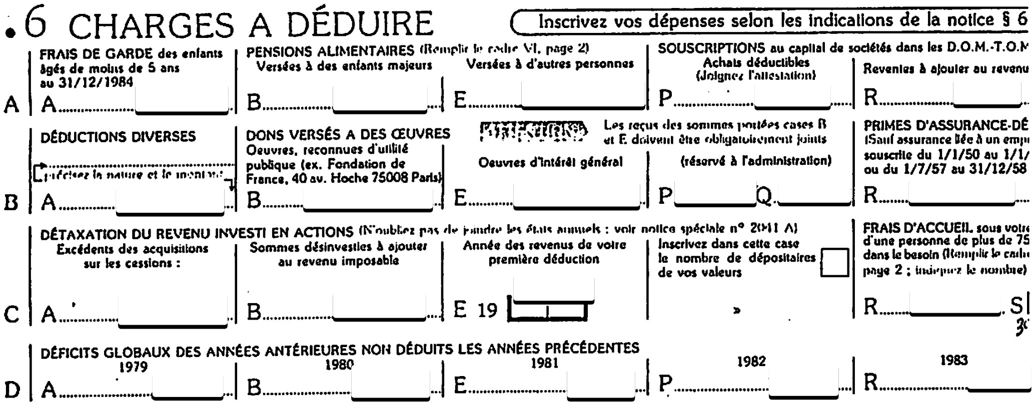
RÉSIDENCE ………… LIEU-DIT …………

BÂTIMENT ……… ESCALIER ………… ÉTAGE ………… N° D'APPARTEMENT …………

COMMUNE ……………………

CODE POSTAL ☐☐☐☐☐ COMMUNE ……………………
de rattachement postal (le cas échéant)

B. Section dedicated to deduction from taxable income



6 CHARGES A DÉDUIRE

Inscrivez vos dépenses selon les indications de la notice § 6

A	FRAIS DE GARDE des enfants âgés de moins de 5 ans au 31/12/1984 A……	PENSIONS ALIMENTAIRES (Remplir le cadre VI, page 2) Versées à des enfants majeurs B……	Versées à d'autres personnes E……	SOUSCRIPTIONS au capital de sociétés dans les D.O.M.-T.O.M Achats déductibles (Joignez l'attestation) P……	Reventes à ajouter au revenu R……
B	DÉDUCTIONS DIVERSES Précisez la nature et le montant A……	DONS VERSÉS A DES ŒUVRES Oeuvres, reconnues d'utilité publique (ex. Fondation de France, 40 av. Hoche 75008 Paris) B……	Oeuvres d'intérêt général E……	Les reçus des sommes portées cases B et E doivent être obligatoirement joints (réservé à l'administration) P Q	PRIMES D'ASSURANCE-DÉ (Sauf assurance liée à un emp souscrite du 1/1/50 au 1/1/ ou du 1/7/57 au 31/12/58 R……
C	DÉTAXATION DU REVENU INVESTI EN ACTIONS (N'oubliez pas de joindre les états annuels : voir notice spéciale n° 2041 A) Excédents des acquisitions sur les cessions : A……	Sommes désinvesties à ajouter au revenu imposable B……	Année des revenus de votre première déduction E 19 ☐☐	Inscrivez dans cette case le nombre de dépositaires de vos valeurs ☐	FRAIS D'ACCUEIL sous votre d'une personne de plus de 75 dans le besoin (Remplir le cadr page 2 ; indiquez le nombre) R…… S
D	DÉFICITS GLOBAUX DES ANNÉES ANTÉRIEURES NON DÉDUITS LES ANNÉES PRÉCÉDENTES 1979 A……	1980 B……	1981 E……	1982 P……	1983 R……

Notes: The picture shows a standard personal income tax form for 1984. In panel B, we display the page of the tax form pertaining to deductions from taxable income (section 6 of the tax form). The French tax system does not have a standard deduction so all deductions need to be itemized in section 6 of the tax form. Deduction for charitable contribution are reported in box 6BB for contributions to standard charities ("dons verses a des oeuvres") and 6BE for contributions to associations d'interet general. Contributions in box 6BE are subject to a cap at 1% of taxable income. The form also indicates "les recus des sommes portées cases B and E doivent être obligatoirement joints", which means "receipts for contributions reported in boxes B and E must be attached to the tax form".

Table A.1: ESTIMATES OF THE DROP IN REPORTED CONTRIBUTIONS IN FRANCE DUE TO THE 1983 REFORM

	(1)	(2)	(3)	(4)	(5)	(6)
	OLS	OLS	Logit	Censored Quantile Regression		
				q=.8	q=.9	q=.99
			Dependent variable: log of contributions			
$\mathbb{1}$[After 1983]	-0.640***	-0.729***	-0.594***	-3.209***	-1.122***	-0.260***
	(0.0497)	(0.0361)	(0.0545)	(0.00188)	(0.00109)	(0.000790)
Income groups FE	YES	YES	YES	YES	YES	YES
Marital status FE	YES	YES	YES	YES	YES	YES
# children FE	YES	YES	YES	YES	YES	YES
Years 1979 and 1984 only	NO	YES	NO	NO	NO	NO
N	134560	73607	134560	134560	134560	134560

Notes: Robust s.e. in parentheses clustered at the year×income group level.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$. The Table displays estimates of the effect of the 1983 reform on the log of reported contributions using four cross-sections of individual tax returns (1975, 1979, 1984 and 1988) with oversampling of rich taxpayers. Regressions are weighted using sample weights. Column (1) uses a simple time series identification. In column (2), we focus on years 1979 and 1984 (the two samples closer to the reform date) to control for the presence of differential time trends in reported contributions before and after the reform. In column (3) we estimate a logit model on the probability of reporting contributions. We report the average marginal effect of the 1983 reform on the probility of giving , in percentage terms ($\frac{d\mathrm{Pr}}{dx} \cdot \frac{1}{\mathrm{Pr}}$) In column (4) to (6), we estimate three-step censored quantile regressions *à la* Buchinsky and Hahn [1998]. Between 15 to 25% of taxpayers report contributions depending on the covariates, so the conditional distribution of contributions is usually not defined below the 75th percentile. Estimates suggest that lower parts of the conditional distributions of contributions were the most affected by the 1983 reform.

Table A.2: PRICE ELASTICITY ESTIMATES: ADDITIONAL ROBUSTNESS CHECKS

	(1)	(2)	(3)	(4)	(5)
	Tobit	Tobit	OLS	2SLS	2SLS
Dependent Variable	Log(gift+1)		Proba. of contributions > 0		
$\log(1-\tau) \times$ [Before 1983] (α_1)	-5.886***	-5.326***	-0.292***	-0.294***	-0.354***
	(0.136)	(0.123)	(0.0358)	(0.0361)	(0.0426)
$\log(1-\tau) \times$ [After 1983] (α_2)	-3.835***	-0.821	-0.0536	-0.0537	-0.0648
	(0.378)	(0.476)	(0.0354)	(0.0355)	(0.0372)
ε_1	-0.776	-0.612	-1.803	-1.816	-2.186
	(0.0180)	(0.0141)	(0.221)	(0.223)	(0.263)
ε_2	-0.505	-0.0944	-0.331	-0.332	-0.401
	(0.0499)	(0.0547)	(0.219)	(0.219)	(0.230)
Year×income groups FE	YES	YES	YES	YES	YES
Year×marital status	YES	YES	YES	YES	YES
Year×# children FE	YES	YES	YES	YES	YES
Year×marital status×log(income)	NO	YES	NO	YES	YES
Year×# children FE ×log(income)	NO	YES	NO	YES	YES
Test $\alpha_1 = \alpha_2$					
Prob $> \chi^2$	0.00	0.00	0.00	0.00	0.00
N	134560	134560	134560	134560	134560
R^2 or pseudo R^2	0.059	0.061	0.115	0.115	0.116

Notes: Standard errors in parentheses, clustered at the year×QF group×income group level. The sample includes all taxpayers below the 95th percentile of the income distribution. All models include controls for the logarithm of disposable income interacted with year fixed effects, income decile fixed effects, marital status fixed effects and number of children fixed effects. The dependent variable is log(gift+1) in the tobit specification of columns (1) and (2) and an indicator of a positive gift in the linear probability model of columns (3) to (5). Columns (1) to (3) present reduced-form results, using the log of price at the first euro of charitable contributions, and columns (4) and (5) present the results of the 2SLS specification. In columns (1) and (3) we interact the marital status and number of children fixed effects with year fixed effects. In columns (2) and (4), to control for different profiles of contributions with respect to income across QF groups, we interact the logarithm of income with marital status × year fixed effects and with number of children × year fixed effects. For each column, we report the results of a test of equality of the coefficients α_1 and α_2. We also report the estimated elasticities of contributions before the reform ε_1 and after the reform ε_2 implied by the parameter estimates of the model.

Table A.3: HETEROGENEITY OF THE ELASTICITY OF OVERREPORTED CONTRIBUTIONS ACROSS TAXPAYERS

(1)	(2)	(3)	(4)	(5)
Share of overreported contributions Before 1983	Elasticity of reported contributions		Elasticity of overreported contributions	
	Before 1983	After 1983		
$1-\alpha$	$\varepsilon_B^{G^r}$	$\varepsilon_A^{G^r}$	$\varepsilon^{G^O} \leq \overline{\varepsilon^{G^O}}$	
			Conservative bound	Tighter bound
A. Lower income taxpayers (P0-50)				
.67	-1.48	-.43	-3.47	-4.02
	[.28]	[.22]	[.75]	[.64]
B. Higher income taxpayers (P50-100)				
.47	-.92	-.51	-1.36	-1.56
	[.29]	[.33]	[.57]	[.56]
C. Taxpayers with wage income only				
.59	-1.87	-.81	-3.22	-3.9
	[.21]	[.22]	[.52]	[.48]
D. Taxpayers with some self-reported income				
.27	-1.08	-.71	-2.2	-3.45
	[.37]	[.38]	[1.56]	[1.27]

Notes: The Table reports the value of the upper bound $\overline{\varepsilon^{G^O}}$ on the elasticity of overreported contributions for various categories of taxpayers. We compute the share of overreported contributions using the value of the drop in contributions for each categiry of taxpayers and under the assumption that underreporting after the reform is equal to 20%. We report two values for the bound $\overline{\varepsilon^{G^O}}$. A conservative one, where we use a conservative upper bound on the elasticity of true contributions after the 1983 reform. We also report a tighter bound where we use the tighter bound $\frac{G^r}{g}\varepsilon_A^{G^r}$ on the elasticity of true contributions after the 1983 reform. Standard errors are reported in between brackets. For $\overline{\varepsilon^{G^O}}$ standard errors are bootstrapped with 50 replications using a bootstrapping stratified at the year× income group level. In panel A we focus on taxpayers in the lower half of the total income distribution while in panel B, we look at taxpayers in the top half of the total income distribution. In panel C, we focus on taxpayers with wage income only. In panel D, we look at taxpayers who report some positive self-reported income. Self-reported income include any form of income (self employment earnings, capital income, etc) that were not third-party reported to the tax administration at the time of the reform.

Table A.4: Tax Schedule in France 1975-1979-1984-1988

1975		1979	
Tax Bracket	Tax rate	Tax Bracket	Tax rate
0-6125	0%	0-8725	0%
6125-6425	5%	8725-9125	5%
6425-7700	10%	9125-10825	10%
7700-12225	15%	10825-17125	15%
12225-16575	20%	17125-22275	20%
16575-20900	25%	22275-28000	25%
20900-25250	30%	28000-33875	30%
25250-29125	35%	33875-39075	35%
29125-50400	40%	39075-65125	40%
50400-71375	45%	65125-89575	45%
71375-92400	50%	89575-105950	50%
92400-113450	55%	105950-125050	55%
113450-	60%	125050-	60%

1984		1988	
Tax Bracket	Tax rate	Tax Bracket	Tax rate
0-6125	0%	0-8725	0%
0-14820	0%	0-17000	0%
14820-15490	5%	17000-17780	5%
15490-18370	10%	17780-21070	9,6%
18370-29050	15%	21070-33310	14,4%
29050-37340	20%	33310-42820	19,2%
37340-46920	25%	42820-53770	24%
46920-56770	30%	53770-65070	28,8%
56770-65500	35%	65070-75070	33,6%
65500-109140	40%	75070-125080	38,4%
109140-150100	45%	125080-172030	43,2%
150100-177550	50%	172030-203490	49%
177550-201970	55%	203490-231480	53,9%
201970-228920	60%	231480-	56,8%
228920-	65%		

Notes: The above schedule corresponds to single taxpayers with $QF = 1$, as tax liability is computed after dividing taxable income by the number of QF. In 1984, an additional 3% tax rate is applied for taxpayers with tax liability above 32,080 francs.
Source: Table 4.5 in Piketty [2001].