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Taxes and business philanthropy in Armenia

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DISCUSSION PAPER

// ZAREH ASATRYAN AND DAVID JOULFAIAN

Taxes and Business Philanthropy in Armenia

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Taxes and Business Philanthropy in Armenia

Zareh Asatryan*† David Joulfaian*‡

February, 2021

Abstract

The majority of countries around the world provide tax incentives for business philanthropy. However, little is known about the responsiveness of businesses to this tax treatment. This paper expands on this scant literature by focusing on the Armenian tax system which provides incentives for business philanthropy. The support takes the form of a deduction capped at a fraction of business receipts. This generates a kink beyond which the marginal tax subsidy drops to zero. Using administrative panel data for the years 2007 through 2017, we find strong evidence of bunching by Armenian firms at the kink, with a sizeable tax elasticity of giving at the intensive margin. The evidence on bunching is robust to whether firms have been audited, and to whether any tax deficiencies are observed. This suggests that the observed response is likely to be real rather than being driven by reporting responses.

Keywords: Business philanthropy, charitable giving, corporate income taxes, firm behavior, bunching, tax-price elasticity.

JEL codes: H25, H32, M14.

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†ZEW Mannheim and CESifo Munich, zareh.asatryan@zew.de.

‡U.S. Department of the Treasury and Georgetown University, david.joulfaian@treasury.gov.

1 Introduction

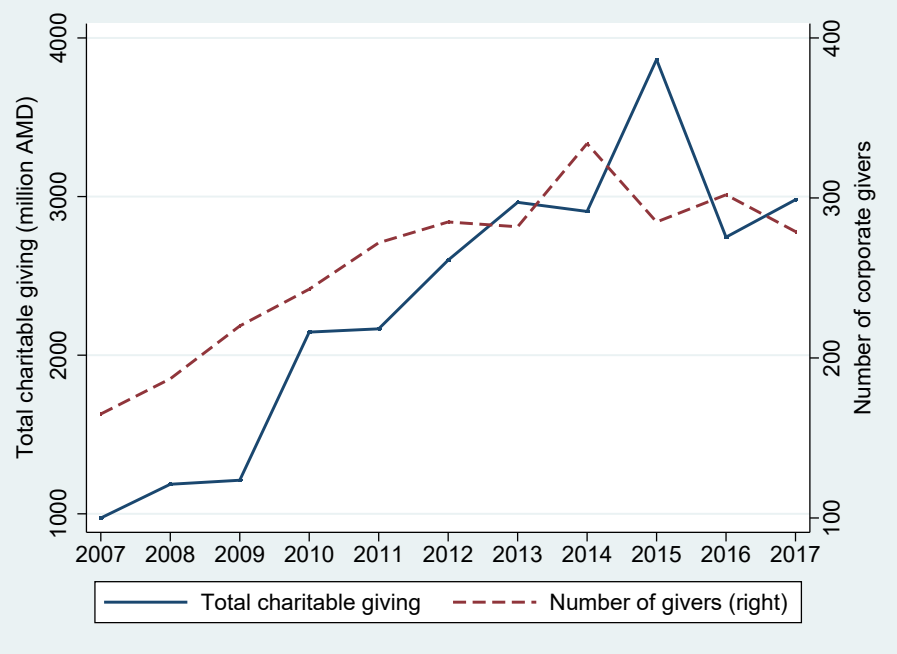
About three quarters of countries around the world provide tax incentives for corporations to contribute to charitable organizations (Quick et al. 2014). These incentives aim to facilitate the private provision of public goods that are perceived to be beneficial to the society. However, these subsidies lead to revenue losses to the government. Reflecting on this trade-off, economic theory suggests that subsidies for charitable activity may be desirable if they induce sufficiently large increases in giving (Saez 2004). However, with few exceptions, little is known about the efficacy of tax incentives for business philanthropy.

Profit maximization plays an important roles in shaping corporate giving. Of course, there are other factors that influence giving that reflect on managerial discretion and may not be in harmony with profit maximization and shareholder preferences. And the effect of tax incentives can be ambiguous depending on how these various factors interact (Clotfelter 1985, Navarro 1988). Accordingly, we explore the question of whether businesses give more because of these tax incentives, and, if they do, what is the elasticity of charitable donations with respect to their tax-price. In so doing we contribute to the scant literature on the role of taxation in business philanthropy, as well as to the broader literature on the economics of charitable giving. For general reviews of this literature, see, List (2011) and Joulfaian (2005), and for a more technical treatment of the literature, see, Andreoni and Payne (2013).

In particular, we extend the existing and mostly US-focused literature on the tax-price elasticity of corporate giving to a developing country context. We also contribute to this literature methodologically. Instead of using variation in tax rates coming across firms, or using the IV strategy as in Gruber and Saez (2002) to overcome the endogeneity of income and donations in analyzing tax reforms, we identify the tax-price elasticity of corporate giving from non-linear budget sets. We build on the bunching literature introduced in Saez (2010) and Chetty et al. (2011),[1] and examine giving patterns around the kink generated by the cap on charitable deductions.

[1]For an application of the bunching methods on firms, see, Devereux et al. (2014), and for a review of the literature on bunching methodology, see, Kleven (2016). For a more general review of literature on elasticity of taxable income, see, Saez et al. (2012).

Figure 1: Business Philanthropy in Armenia

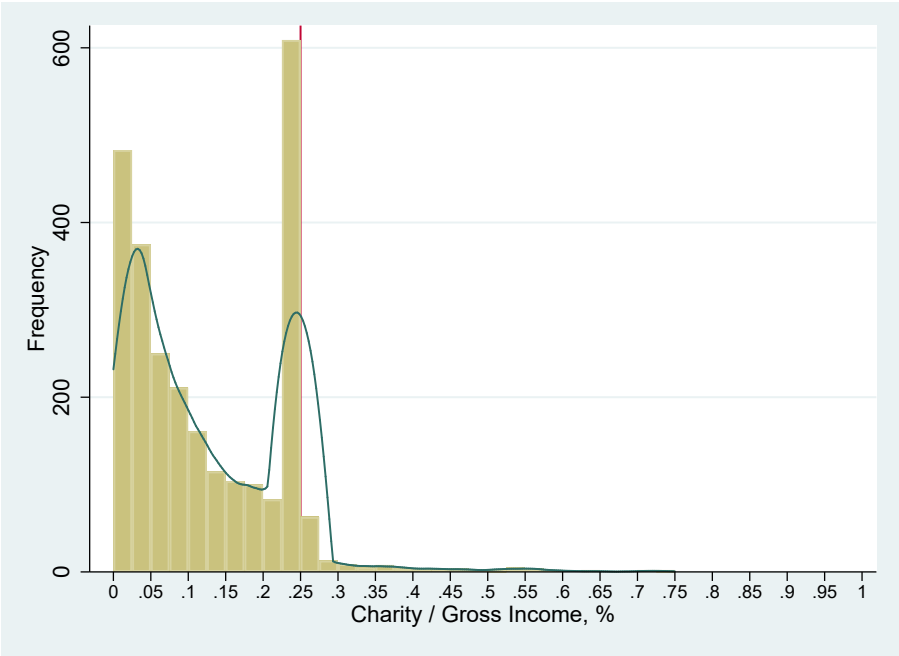


$Notes$: Calculated based on annual corporate tax returns of 2007-2017. The total of about 3 billion Drams of giving in 2017 which is equivalent to about 0.06% of GDP.

We employ data from the population of tax returns of Armenian firms for the tax years 2007 to 2017. Figure 1 shows the aggregate value of giving and the number of donors over time. In 2017, reported contributions were three billion Armenian Drams. This is slightly less than 0.1% of GDP, but about the same share observed for the US and France.[2] Armenia is a relevant case study not only because of the availability of administrative data and the opportunity to exploit the kink as a natural experiment, but also because in the absence of meaningful tax incentives for individuals, corporate giving becomes the most important margin. Businesses are able to deduct contributions up to 0.25 percent of gross income or turnover. Before this kink, the price of giving is one minus the corporate income tax rate, and after the kink it increases to one or the full price of giving. This tax treatment is similar

[2]US corporations reported about $18.7 billion in contributions in 2017, slightly less than 0.1 percent of GDP of 19.5 trillion. See IRS. French corporate giving is estimated at 1.29 to 2.9 billion Euros for 2014, roughly 0.04 to 0.1 percent of GDP.

Figure 2: Charitable Donations as a Fraction of Gross Income around the Kink Point



Notes : The histogram is based on pooled annual corporate tax returns of firms in Armenia for the years 2007 to 2017. the red vertical line denotes the kink point at 0.25% of the fraction of charitable giving to gross income. Bins are set at 0.025% of gross income.

to that in France where the deduction is capped at 0.5 percent of turnover.[3] But it is unlike the US where the deduction is capped at 10 percent of net and not gross income.

We find evidence of strong bunching patterns of firms at the cap where tax incentives for giving change. As shown in the preliminary evidence of Figure 2, close to a quarter of givers are located just below the kink point. This evidence holds robustly for every year, industry, and firm size. Following the "sufficient statistic" approach, we calculate a large tax-price elasticity of corporate giving at the intensive margin in Armenia which is estimated at about 3.

Although the distinction of elasticity of taxable income coming from real and reporting responses is in general irrelevant for efficiency and revenue implications of a tax (Feldstein 1999), it will matter in the case of misreporting of gifts. Deductions have fiscal externalities (Chetty 2009, Doerrenberg et al. 2017) and these may have different policy implications. For example, if evasion is a significant driver of the response, the policy implications may

[3]A tax credit equal to 60 percent of contributions below this cap is available in France. (see, European Fundraising Association 2018).

be to improve enforcement given revenue losses to the government in the absence of any fiscal externalities on charitable funds. This distinction is especially relevant for our case since our elasticity estimate is very large as compared to the past literature. However, in the case of Armenia, over-reporting of deductions is unlikely to take place due to the administrative rules requiring beneficiary charities to report the sources and amount of their receipts, thus generating third-party information on giving. Consistent with this, we show that giving by firms that were selected for a tax audit was not less sensitive to tax incentives than giving by firms not audited. A similar outcome is observed when audited firms with tax deficiencies are contrasted to those without. Thus, we conclude that our estimated large tax- price elasticity of giving is likely to reflect real behavior rather than be driven by reporting responses. We note that this is a static estimate, but it is certainly likely that some firms smooth donations over time to ensure maximum usage of the deductions. Either way, a policy implication of this large elasticity estimate is that the government should consider raising the cap on deductions since the resulting additional foregone revenues will very likely be well compensated by revenues received by the charitable sector.[4]

The remainder of this paper is structured as follows. Section 2 discusses the relevant literature. Section 3 describes the taxation setting in Armenia. Section 4 sets the basic theoretical framework in how we model giving and discusses the data and our empirical approach in identifying the tax-price elasticity of corporate giving. Section 5 presents the results. Section 6 concludes.

2 Literature

This paper contributes in several ways to a large empirical literature that addresses estimates of the tax-price elasticity of giving. Our paper is one of the few in the literature that is concerned with firms rather than individual philanthropy. This is important since, unlike

[4]This policy implication assumes that the provision of goods by the charitable sector is beneficial for society. This may be a strong assumption if tax-exempt donations are used for the private benefit of firms rather than for privately providing public goods Bertrand et al. (2020).

individuals, corporate executives need to consider the interests of shareholders.[5] If the firm maximizes profits, then taxes do not matter (Clotfelter 1985, Navarro 1988). On the other hand, if firm executives shirk shareholder responsibilities or pursue other goals in their giving decisions, then taxes can be an important consideration.

In the case of individual giving, estimates from the US mostly suggest elasticities close to unity (Auten et al. 2002, Bakija and Heim 2011, Feldstein 1975, Feldstein and Clotfelter 1976, Feldstein and Taylor 1976). Fack and Landais (2010) find a relatively small price elasticity in France. This is consistent with the evidence from the UK by Almunia et al. (2020) who disentangle the extensive and intensive margin elasticities of giving, and also arrive at a welfare estimate of the tax subsidy by modelling the costs of giving. A meta-analytical review of this literature by Peloza and Steel (2005) finds that the price elasticity of giving by individuals is on average above unity.

In contrast, the literature on corporate giving is almost always centered on the US. Early papers such as those by Schwartz (1968) and Clotfelter (1985) provide evidence from time series data for the US and show positive elasticities for giving with respect to the tax rate. But these estimates are not very reliable due to the aggregate nature of the data. Carroll and Joulfaian (2005) extend the evidence to panel data from administrative records on US firms by exploiting variation in tax rates due to the organizational form by firms and the choices they have made between corporate and non-corporate forms. Carroll and Joulfaian (2005) find strong evidence of tax effects, but with the caveat that data is cross sectional while organizational choices can be endogenous. Navarro (1988) employs data from a pooled cross section data with 249 observations obtained from the American Council for the Arts. Using each corporation's average tax rate as the key measure of interest, and in contrast to the above literature, arrives at a negative albeit not precisely measured elasticity estimate. Similarly, Boatsman and Gupta (1996), using a sample of 212 corporations during a period that straddles the Tax Reform Act of 1986, estimate a negative and statistically significant elasticity measure for giving with respect to the tax rate. The authors conclude that this depressing

[5] Milton (1962) made the case that the social responsibility of corporations is to shareholders and that they should not make charitable gifts.

effect of taxes on giving argues in favour of reasons other than the profit-maximizing motive of managers. Auten and McClelland (2001) attribute this finding of negative and significant elasticity to the small sample size employed and the possible dynamics introduced by the Tax Reform Act of 1986.

Relatedly, Navarro (1988) also explores a number of other factors in addition to the tax rate. He finds evidence in support of corporate contributions as a form of advertising, and that they may also represent a form of benefits to employees. Similarly, Lev et al. (2010) find that philanthropy furthers firms objectives in the sense of improving customer satisfaction and increasing future revenue, while more recently Bertrand et al. (2020) show how tax-exempt giving is used for lobbying purposes. Finally, Card et al. (2010) show that the location of corporate headquarters in the US has substantial effects on the receipts of local charities. However, the effects seem to be mainly driven by the arrival of highly-compensated individuals rather than through direct donations by the corporations themselves.

Several papers relate to these results either because they extend these basic findings, or because they can inform on estimates of the tax-price elasticity by more generally studying the price elasticity of giving. Hickey et al. (2019) and Teirlinck (2020) show that the price elasticity of giving is sensitive to salience effects. However, it is not clear whether salience matters per se, or whether the mechanism works through introducing some social motives to give (Kessler 2017). Relatedly, Scharf and Smith (2015) show that the magnitude of price elasticity is larger depending on whether the incentives are framed as a matching fund than as a tax rebate. On the other hand, the field experiments of Karlan and List (2007) and Karlan et al. (2011) find only weak evidence that even 1:3 matches increase giving. Bittschi et al. (2020) study the relation between religious and charitable giving, while Yörük (2015) and Petrova et al. (2020) study the relation between political and charitable giving. Randolph (1995) shows that estimates of price elasticity of giving can be exaggerated if arguments of inter-temporal shifting are ignored.Scharf (2000) takes a political economy approach and asks normatively why is it that politicians decide to offer tax subsidies for donations.

Weak enforcement institutions open up the opportunity that the very large elasticity estimates we have found are potentially over-estimated due to the over-reporting of deductions. Consistent with this hypothesis, Tazhitdinova (2018) and Fack and Landais (2016) use reforms tightening enforcement in the US and France, respectively, and show that giving decreases substantially in response to enforcement. Rehavi and Shack (2010) compares administrative and survey data to show that a quarter of tax-price elasticity estimates is due to reporting. On the other hand, Gillitzer and Skov (2018) shows that the introduction of third party reporting in Denmark actually increased claims, which highlights the role of inattention and compliance costs of taxpayers in reporting behavior. Slemrod (1989) uses line-by-line audited data from TCMP-1982 to show that the estimated tax responsiveness of charitable giving is not inflated strongly by over reporting of deductions. Using TCMP-1987 data, Joulfaian and Rider (2004) also arrive at a similar conclusion and show that the estimated elasticity coefficient changes little when the focus shifts from reported to corrected contributions. However, they show that the findings of Slemrod (1989) change dramatically after considering income misreporting and its consequences to the computed marginal tax rate.

3 Background

3.1 Tax rate and tax base

The Armenian profit tax applies at a flat income tax rate of 20%. Many investments are accorded accelerated depreciation allowances which depress taxable income. Investments in computers, for instance, are expensed. In another example, hotel structures are depreciated over a ten year period.

Armenian businesses are accorded a deduction for giving to charitable organizations. Deductions reported by firms are capped at 0.25% of gross income or turnover. In other words, the tax rate applied to deductions is zero beyond this cap, while every Dram of giving before the kink costs firms 0.8 Drams. Again, using turnover to delineate a limit on deductions is similar to the corporate incentives available in France. But it is unlike the US and most Euro-

pean countries where the deduction is capped at some fraction of taxable income (European Fundraising Association 2018).

Deductible transfers are defined to include monetary or in-kind transfers to "non-profit organizations, libraries, museums, public schools, boarding schools, nursing homes, orphanages, as well as psychiatric and anti-tuberculosis dispensaries and hospitals".[6] Note that gifts by individuals are not deductible under the personal income tax, making business gifts the only channel for tax incentives to shape giving.

Armenian law directs the tax authority to list the names of charitable organizations qualifying for tax deductible contributions. And this assits donor firms in making gifts and claiming deductions. Figure 3 presents the distribution of receipts of the non-profit sector by industry in Armenia in 2017. For further details on the taxation system in Armenia, see, Asatryan and Peichl (2017).

3.2 Enforcement environment

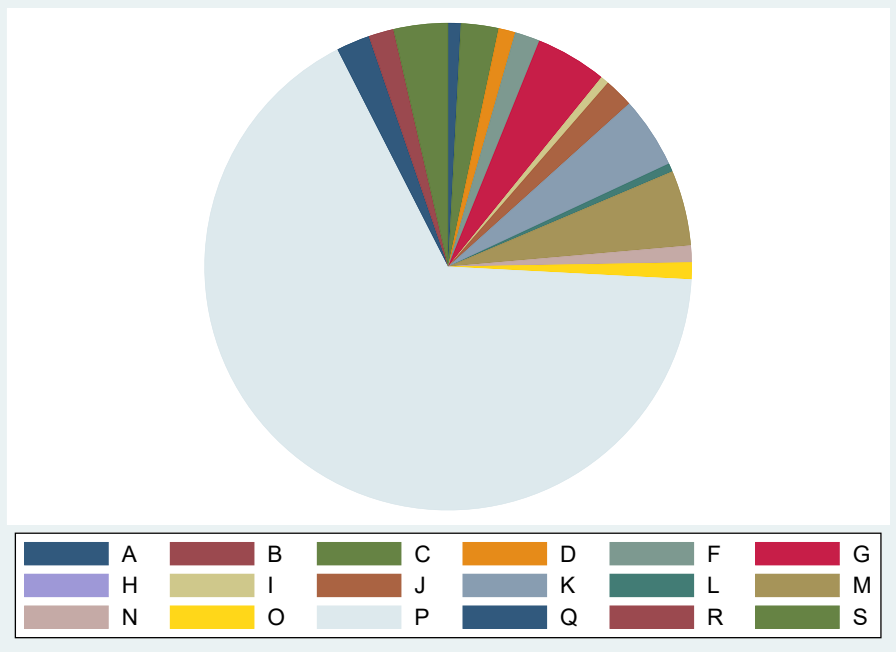
The enforcement practices regulating giving are fairly strong. Firms are required to provide receipts when claiming deductions for gifts. More importantly, Armenian law mandates the charitable organizations to present annual reports where they also need to report the amount and source of their income.[7] These reports are publicly available at the website of the tax authority.[8] The reports generate third-party information on charitable deductions by givers. Although we do not know how exactly the tax authority uses this information, in principle the availability of the information practically makes the over-reporting of deductions very unlikely. The system of third-party reporting has improved over time, but reporting forms filled by

[6] See article 23, paragraph (a) of the Law of Republic of Armenia adopted in 1997 on "Corporate Profit Taxes" here in Armenian.

[7] See article 39, paragraph 1 of the Law of Republic of Armenia adopted in 2002 on "Foundations" here in Armenian.

[8] Currently the reports are available under the heading "Reports of non-profit enterprises", and can be found in Armenian here. As an example, the foundation called "Zangezur Copper-Molybdenum Plant Foundation", which closely follows the name of one of the largest mines in the country, reports that in 2019 it has received 105 million Dram from "Apaven CJSC" and another 30 million Dram from "Arpaniv CJSC" (see this example report here in Armenian).

Figure 3: Distribution of Receipts of the Non-Profit Sector by Industry



Notes : This pie chart presents the distribution of gross income of non-profit entities filing in Armenia in 2017 over the NACE first-digit industry codes. The vast majority goes to education (P), followed by professional, scientific and technical activities (M). For the full list of NACE codes see here.

charitable organizations in the early years of our data already contained the basic elements needed for this system to function, that is the amount and source of givers.

4 Modeling giving

4.1 Theoretical framework

Building on Clotfelter (1985), consider a firm in simple one period framework. The executives maximize utility which is shaped by the net of tax profits, or dividends to shareholders, and charitable gifts made by the firm:

$$U = U(Y, G) \tag{1}$$

where Y is after tax profits defined as:

$$Y = (PQ(K, L, G) - rK - wK)(1 - \tau) - G(1 - \alpha\tau) \tag{2}$$

where τ is the profit tax rate, PQ is total revenue with price P and Q units, a function of capital, K, labor, L, and gifts, G, if it is an input in the form of goodwill among others; and $0 < \alpha < 1$ is the fraction of gifts G that are tax deductible.

The first order condition yields:

$$\frac{\partial U}{\partial G} = PQ_G(1 - \tau)U_Y - (1 - \alpha\tau)U_Y + U_G = 0 \tag{3}$$

When $U_G = 0$, the manager does not derive utility from corporate giving. And when additionally $\alpha = 1$, i.e. gifts are fully deductible, then the firm will give 1 Dram to charity up to the point where it is equal to the marginal revenue product, or:

$$PQ_G = 1 \tag{4}$$

where profit is maximized, and taxes do not matter as in Clotfelter (1985), Navarro (1988), and others.

But when $U_G > 0$, and again assuming $\alpha = 1$, after rearranging Equation 3, the firm will give up to the point where:

$$PQ_G(1 - \tau) + U_G/U_Y = (1 - \tau) \tag{5}$$

where, unlike in equation 4, taxes do matter and the firm is said not to maximize profits. This is the empirical question that has been examined in the literature, testing the validity of equations 4 and 5.

When contributions are partially deductible, with $\alpha < 1$, then 4 becomes:

$$PQ_G = (1 - \alpha\tau)/(1 - \tau) > 1 \tag{6}$$

where firms give below the optimal level in 4, and 5 becomes:

$$PQ_G(1 - \tau) + U_G/U_Y = (1 - \alpha\tau) \tag{7}$$

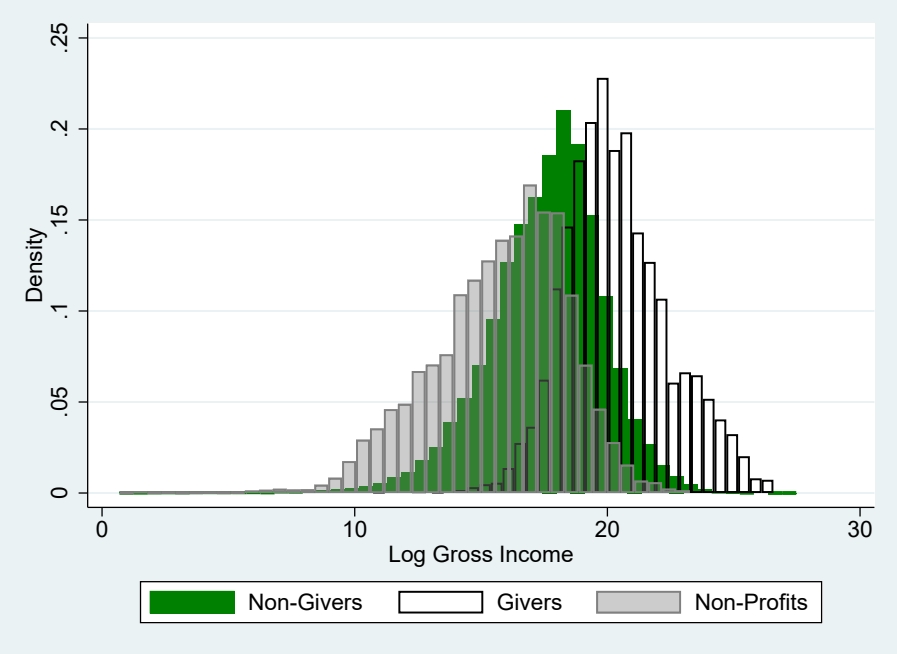
Now taxes matter regardless of whether the firm maximizes profits and what value U_G takes.

4.2 Data

We use administrative data on the population of corporate tax returns for the year 2007 to 2017. The data contain 5 to 13 thousand firms filed annually, reflecting on growth between 2007 and 2017. We concentrate on for-profit firms, and drop non-profit firms which are included in the available data and which make about 15% of our observations. These dropped entities include NGOs, foundations, local governments, state-owned non-profits, unions, and various other legal forms of non-profits that operate in Armenia. Figure 4 shows the size distribution of these non-profit firms against the for-profit firms that remain in our sample.

We have all the information that typically goes into the tax return including many items of income and deductible expenses; several basic firm characteristics such as number of employees and industry codes. Our data additionally includes information on whether firms were audited by the tax authority, and, if so, the results of the audits. Table 1 presents summary descriptive statistics by year. It shows the number of firms and their average annual gross income, which ranges between 385 and 673 million Dram (or about 700 to 1350 thousand USD). The latter columns of Table 1 show the number of firms with positive charitable giving, the share of givers in all firms and the average amount of giving by donors. As shown in Figure 4 the size distribution of firms that give to charity is skewed to the right compared to the size distribution

Figure 4: Size Distribution of Firms in Armenia



$Notes$: The histogram is based on pooled annual corporate tax returns of all firms in Armenia for years 2007 to 2017. Firm size is measured by log of gross income. The histograms are shown for three groups of firms. the main sample of for-profits includes 2,653 firm-year observations that give to charity (transparent black bars), and 86,925 firm-year observations that do not give to charity (green full bars). Additionally, there are 15,081 observations that are non-profit firms, which are plotted here as well but they are not included in the main analysis (half-transparent gray bars).

of non-givers. [9] The share of givers is relatively stable over time ranging from about 2.57% to 3.57%, and the average amount of giving ranges from about 5.5 to 13.6 million Dram (or about 11 to 27 thousand USD). Table A1 of the Appendix presents similar statistics across main sectors. Firms in mining and finance stand out as being large in size which also give more in absolute terms.

4.3 Bunching estimator

In what follows, we briefly and intuitively discuss how we use the method developed by Saez (2010) and Chetty et al. (2011) to derive elasticities from excess bunching at a kink. Saez

[9] We also report the size distribution of entities not subject to tax which might be of interest to some readers.

Table 1: Summary Statistics by Year

Year	Gross income		Charitable giving		
	count	mean	count	% givers	mean
2007	5104	433,000	165	3.23	5,901
2008	6721	385,000	187	2.78	6,344
2009	6157	441,000	220	3.57	5,508
2010	7228	673,000	243	3.36	8,830
2011	7693	516,000	272	3.54	7,964
2012	8976	491,000	285	3.18	9,120
2013	12456	388,000	282	2.26	10,500
2014	10397	522,000	334	3.21	8,702
2015	10853	504,000	285	2.63	13,600
2016	10603	544,000	302	2.85	9,087
2017	10850	614,000	279	2.57	10,700

$Notes$: Counts express number of observations with positive values. Means are in thousands Drams. One thousand Drams roughly equals two USD.

(2010) builds a model of individual responses to a kink in the income tax, assuming that individuals decide their earnings by maximising an isoelastic utility function dependent on before- and after-tax earnings and personal ability. The paper shows that the tax elasticity can be estimated empirically as a function of the excess mass of individuals located at the kink compared to a counterfactual linear tax rate without a kink, and the tax rates before and after the kink. Chetty et al. (2011) extends these results by improving the empirical estimation of the excess bunching mass at the kink. They use a regression of a polynomial over the actual distribution of earnings, excluding data from a region around the kink, in order to estimate the counterfactual mass in this region. A region around the kink and not just the point at the kink may have to be excluded due to frictions that that result in individuals failing to relocate directly to the kink.

We follow Saez (2010) and Chetty et al. (2011) and build histograms to document the bunching of firms at the kink point. We then measure of the excess mass of firms at this kink by comparing the mass of firms at this kink point with the counterfactual mass of firms in

the absence of a kink by using the code provided by Chetty et al. (2011). And last we use the following formula from Chetty et al. (2011) (page 761) to calculate the elasticity at the kink:

$$e \approx \frac{b\left(t_0 t_1\right)}{K \cdot ln\left(\frac{1-t_0}{1-t_1}\right)} \tag{8}$$

where $b\left(t_0 t_1\right)$ is the excess bunching mass, estimated empirically, K is the kink point (the amount of deductible firm contribution as percent of turnover) and t_0, t_1 are the tax rates before (20%) and after the kink (zero), respectively.

5 Results

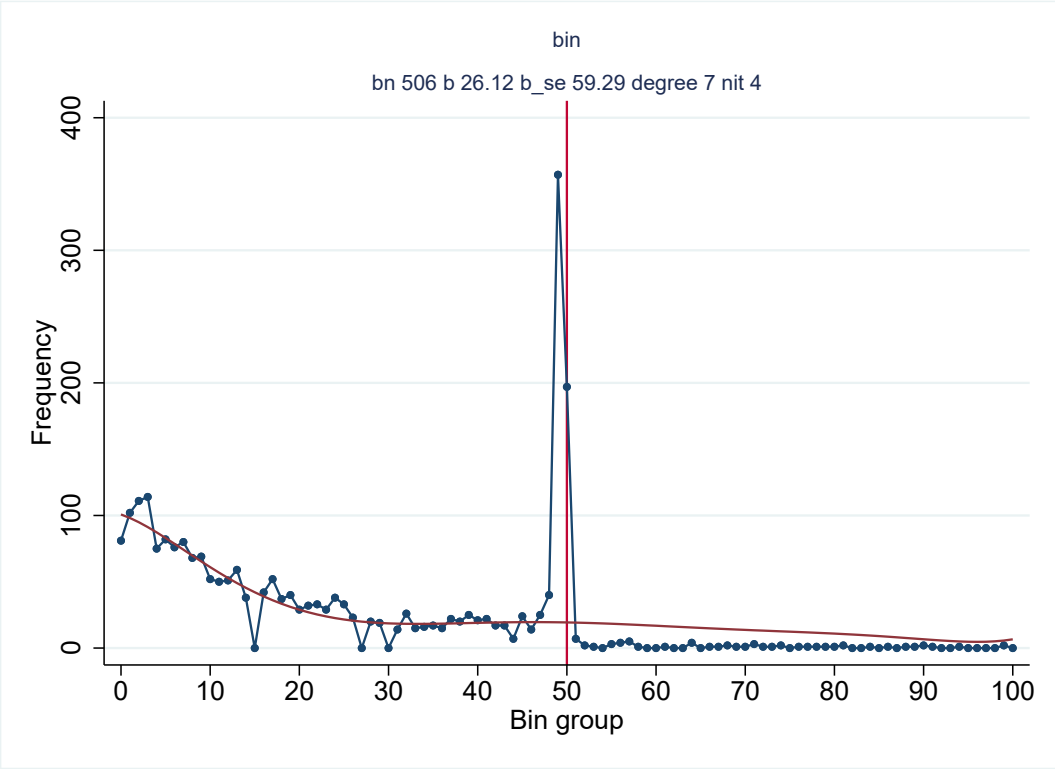
5.1 Baseline results

Strong evidence of bunching is presented in Figure 5. In order to quantify the bunching parameter, i.e. the excess mass of firms at the kink, we need to estimate a counterfactual density had there not been a kink and compare that to the actual density. The estimation of the counterfactual density requires several assumptions on its functional form. We first report our baseline estimate then discuss the sensitivity of the baseline to the choice of these assumptions.

In the baseline scenario, we fix bin sizes at 0.005% of gross income and, in order to estimate the counterfactual density, and exclude 4 bins to the left and 2 bins to the right of the kink.[10] This choice is motivated by a visual inspection of Figure 5, which in our case shows clearly and very sharply the starting and ending interval of the distribution of firms that is affected by the kink. We then estimate the counterfactual using a polynomial of seventh degree using the remaining density of firms, from where it is straightforward to calculate the excess mass. After inserting the estimated excess mass of 26.12 into the elasticity formula of Equation8, we arrive at a baseline tax-price elasticity of giving of 2.942.

[10]This is equivalent to saying that we exclude the density between 0.23% and 0.26% of the fraction of charitable giving to gross income.

Figure 5: Baseline Bunching Analysis of Charitable Donations



Notes : The figure uses the code by Chetty et al. (2011) to estimate the counterfactual density and to calculate the excess mass of firms. More details are in Section 4.3. Bins on the x-axis are equal to 0.005% of the charitable giving to gross income ratio. Thus, the 50th bin, denoted by a vertical line, represents the kink point at 0.25% of gross income. In estimating the counterfactual, we exclude two bins to the left and one bin to the right of the kink point, and use a polynomial of seventh degree. Table 2 presets sensitivity test to these choices.

5.2 Robustness of results

In Table 2 we present evidence showing that the baseline estimate is robust with respect to the choice of the degree of the polynomial as well as to the exclusion of the bins around the kink point when estimating the counterfactual density. In particular, we try excluding up to eight bins to the left and up to six bins to the right of the kink with intervals of two bins, as well as varying the polynomial used in estimating the counterfactual from the non-excluded bins from degree of four to degree of seven. As shown in Table 2, elasticities estimated over these different parameters range between 2.455 to 2.959.

Table 2: Robustness of Elasticity Estimates

Polynomial	Excluded bins		
	(-4;2)	(-6;4)	(-8;6)
4th	2.959	2.608	2.706
5th	2.699	2.455	2.521
6th	2.920	2.457	2.751
7th	2.942	2.473	2.758

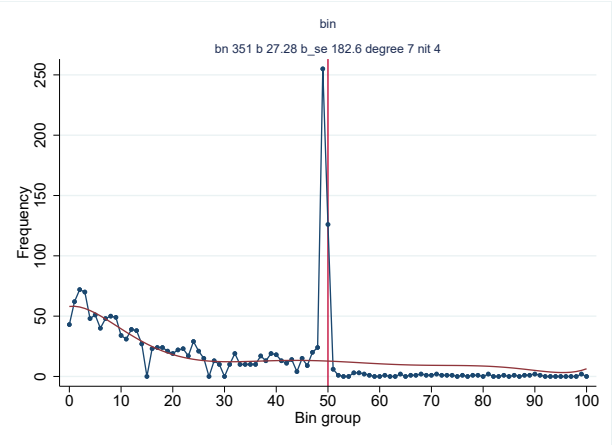
Notes : The table presents robustness tests to the baseline estimate of bunching shown in Figure 5. In particular, it tests for robustness in estimating the counterfactual density by varying the excluded bins around the kink point in columns, and by varying the degrees of the polynomial function in rows. One bin equals 0.005% of the charitable giving to gross income ratio.

One argument against the interpretation that the large elasticity of giving that we have found is due to taxes is that kinks may serve as powerful reference points. If the taxpayers' preferences are strongly reference dependent, then bunching at the kink will partially reflect the shape of taxpayers' non-convex preferences rather purely being driven by tax incentives. For such applications, see, among others Engström et al. (2015), Rees-Jones (2018), Seibold (2019) and for a review of this argument, see, Kleven (2016). In our context, this argument is unlikely to be a major explanation behind the bunching response. The standard argument of reference dependence predicts that giving will center around the kink point, while, in our case, Figure 5 shows that giving is concentrated strictly before the kink with very few firms giving beyond the kink.

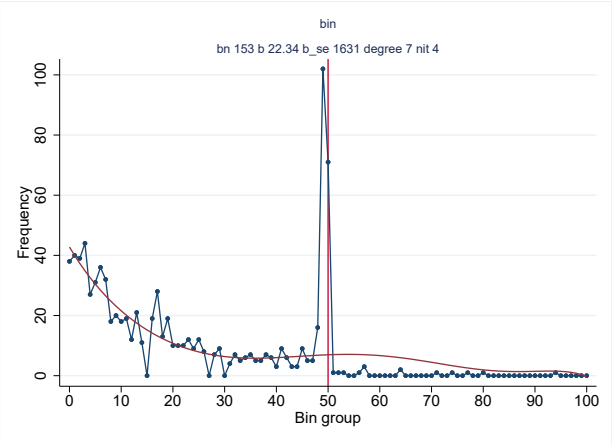
We also present histograms of the frequency of givers around the kink point where tax incentives for giving change across several dimensions of firm characteristics. We attempt to estimate elasticities across time, industries, and firm size. However, we often do not have sufficient data to converge to the local estimator of bunching. Thus, we only show the simple histograms in Figures A1, A2, and A3 in the Appendix, by splitting the sample by, respectively, years, industries, and firm sizes. Visual inspection of these figures hints that the response has been relatively stable over time. Among the industries, we see strongest response by firms in

Figure 6: Bunching Analysis for Audited and Non-Audited Firms

(a) Non-Audited Firms



(b) Audited Firms



$Notes$: This figure replicates the baseline estimate of bunching shown in Figure 5 by dividing the sample into firm-year observations that were either audited or not. For related evidence, see also Figure A4.

the mining sector. When looking at responses across firm sizes, we see that all firms respond at the intensive margin with no very large and visible differences.

5.3 Reporting effects

Finally, we ask whether reporting drives the large elasticity that we estimate. In Figure 6 we replicate the bunching graph for sub-samples of firms that have and have not been audited by the tax authority. In our sample about 15% of firms are audited in a given year, while in the sub-sample of givers, which is skewed towards much larger firms, audited firm-year observations are about a third of the total. Notwithstanding the strict reporting regime, these audit rates may further preempt tax evasion in the form of over-claiming deductions. However, Figure 6 shows that the evidence of bunching is not very different between the audited and not audited group of firms.

In Figure A4 of the Appendix we extend this analysis to a number of other dimensions of audits. In particular, in sub-figures of A4 we split firms into firm-year observations: a-b) that were subjected to desk or real audits, where real audits are more thorough than desk audits; c-d) where tax understatements were discovered or not during an audit; and e-f) where firms

were audited or not in the previous year thus allowing us to study the potential dynamic effects of audits. In general, this evidence suggests that reporting is an unlikely explanation of the observed severe bunching the estimated large tax-price elasticity of corporate giving that we document above.

6 Conclusions

This paper contributes to the scant literature on taxes and business philanthropy. Our analysis exploits the bunching method and administrative tax data to show that taxes are a very important consideration in shaping corporate giving in Armenia. We estimate a large tax-price elasticity of giving at the intensive margin of around 3. Our evidence from audited tax returns suggests that this estimate likely reflects true behavioral responses rather than being driven by reporting effects. This elasticity estimate, albeit it being at the intensive margin, is at the upper end of the distribution of elasticities estimated by previous work on business as well as on individual giving.

The large elasticity that we estimate may suggest that policy makers in Armenia should consider increasing the cap on deductions for giving. Such a reform will likely be treasury efficient. In addition, and assuming that the recipient charitable organizations spend their receipts in a socially desirable way, the reform will likely increase total welfare in the country.

While the elasticity of giving is large at the intensive margin, we also know that very few firms decide to give at the extensive margin. Absent significant tax reforms, we are unable to estimate the extensive margin tax-price elasticity of giving (for such evidence, see, Almunia et al. 2020). Nevertheless, policy makers may consider policies that facilitate more firms to give. The fixed costs for giving are likely not very large in our sample of corporate firms, but a plausible possibility is that many firms, especially small and medium ones, may not be aware of the tax incentive for giving. Therefore one open opportunity for policy makers might be to try and increase the salience of the tax subsidy for giving.

A crucial question in the field of tax deductible business philanthropy in Armenia and elsewhere is whether the non-profit sector uses its receipts in a socially desirable way. The efficacy of the tax subsidy for charitable giving rests on the assumption that recipients of donations will privately provide goods and services that are broadly consistent with the characteristics of public goods. Armenian legislation mandates strict rules on who can benefit from tax-exempt giving, and provides rules for the transparent reporting of how the donations are spent. However, the possibility that firms direct donations to charities such that they are used for the private benefit of the giving firm remains to be studied. The fairly well available public information on the spending activities of entities operating in the non-profit sector in Armenia, as well as data linking the receipts of these entities to individual corporate donors, may make it plausible for future work to study the question of whether tax-exempt giving is spent in a socially desirable way.

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Appendix

Table A1: Summary Statistics by Sector

Sector	Gross income		Charitable giving		
	count	mean	count	% givers	mean
Agriculture (A)	1513	199,000	22	1.45	1,060
Mining (B)	1793	996,000	45	2.51	78,100
Manufacture (C)	11093	621,000	411	3.71	6,022
Construction (F)	9097	357,000	335	3.68	1,864
Trade (G)	25640	617,000	718	2.80	3,952
Finance (K)	3147	2,160,000	242	7.69	17,100
Service (D, E, H, I, J, L, M, N, R, S)	32511	378,000	803	2.47	13,800
Other (O, P, Q, T, U)	10597	153,000	249	2.35	4,110

$Notes$: Counts express number of observations with positive values. Means are in thousands Dram. Sectors are defined loosely by own classification based on NACE first letters as shown in brackets.

Figure A1: Charitable Donations at Kink by Year

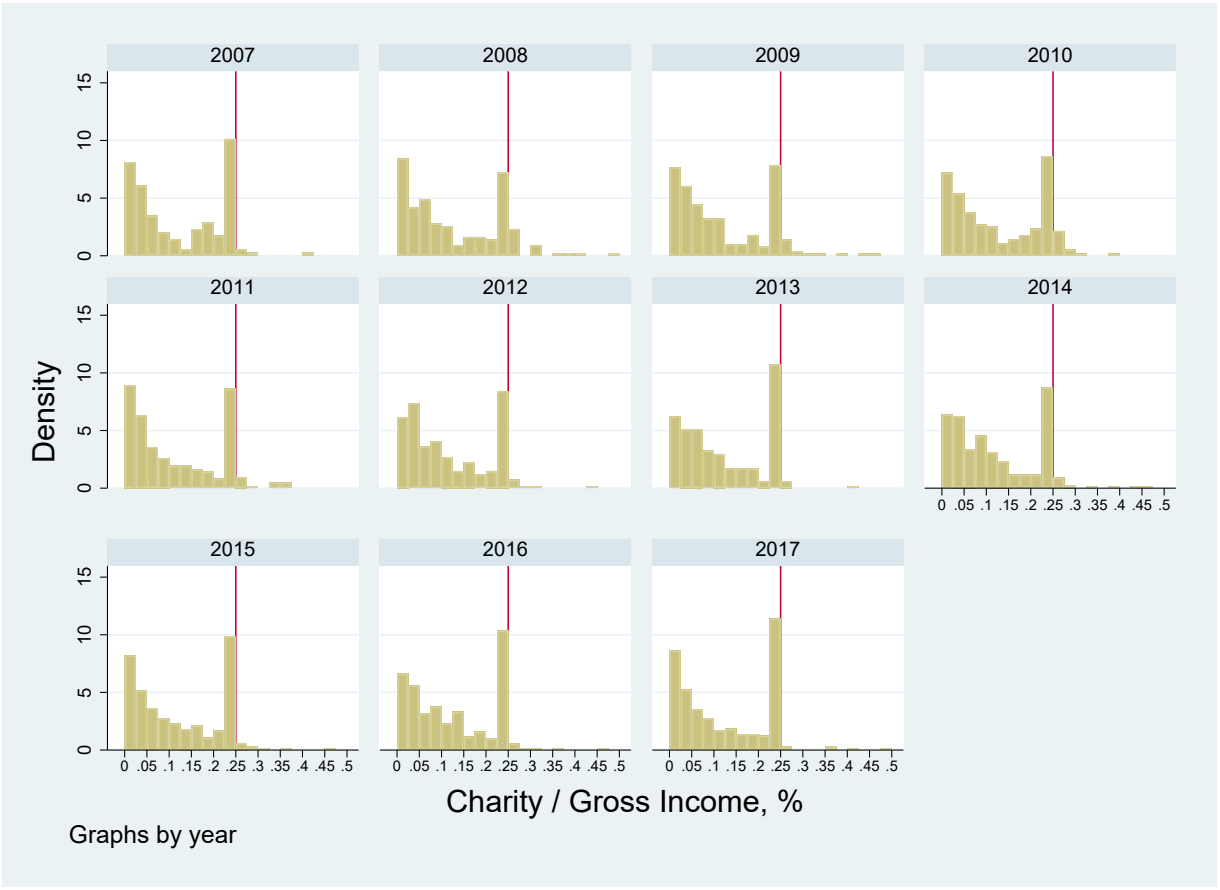


Figure A2: Charitable Donations at Kink by Industry

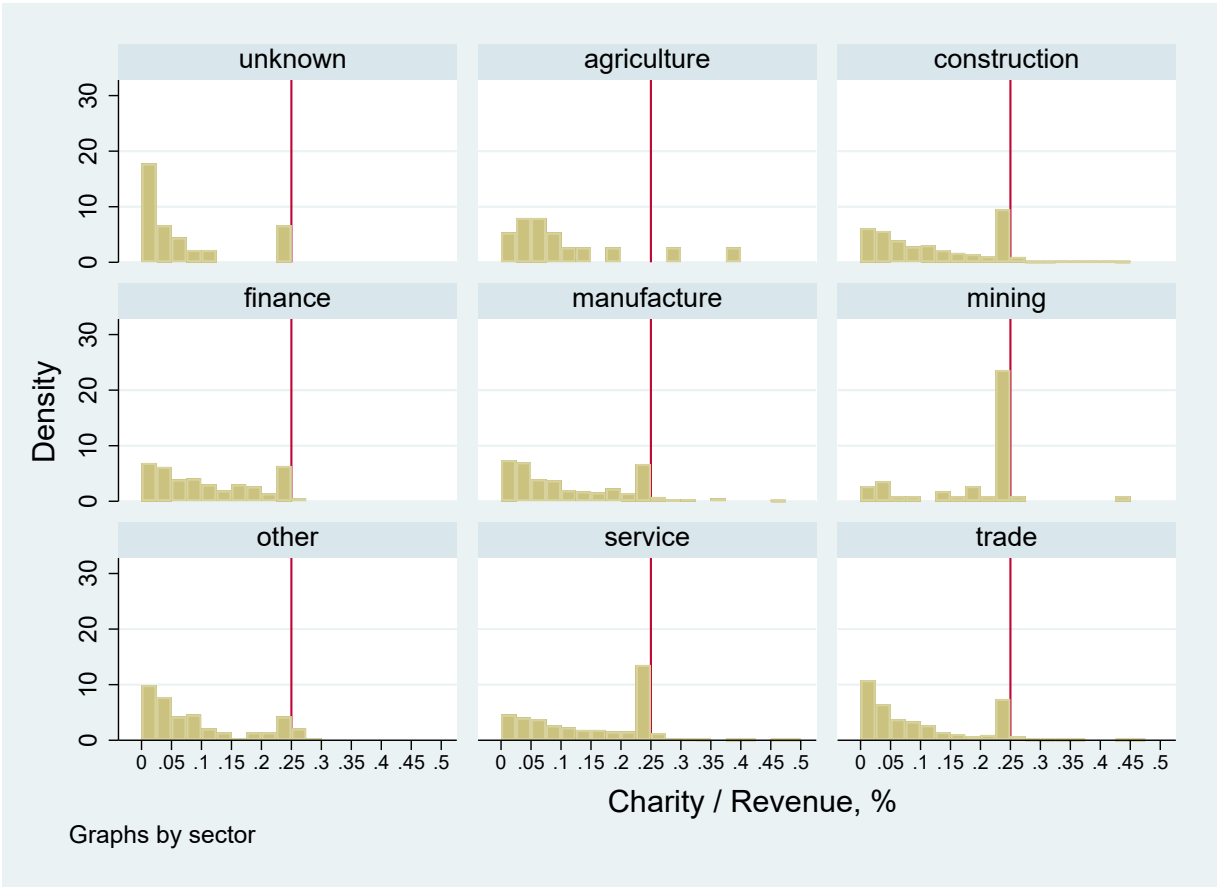


Figure A3: Charitable Donations at Kink by Firm Size

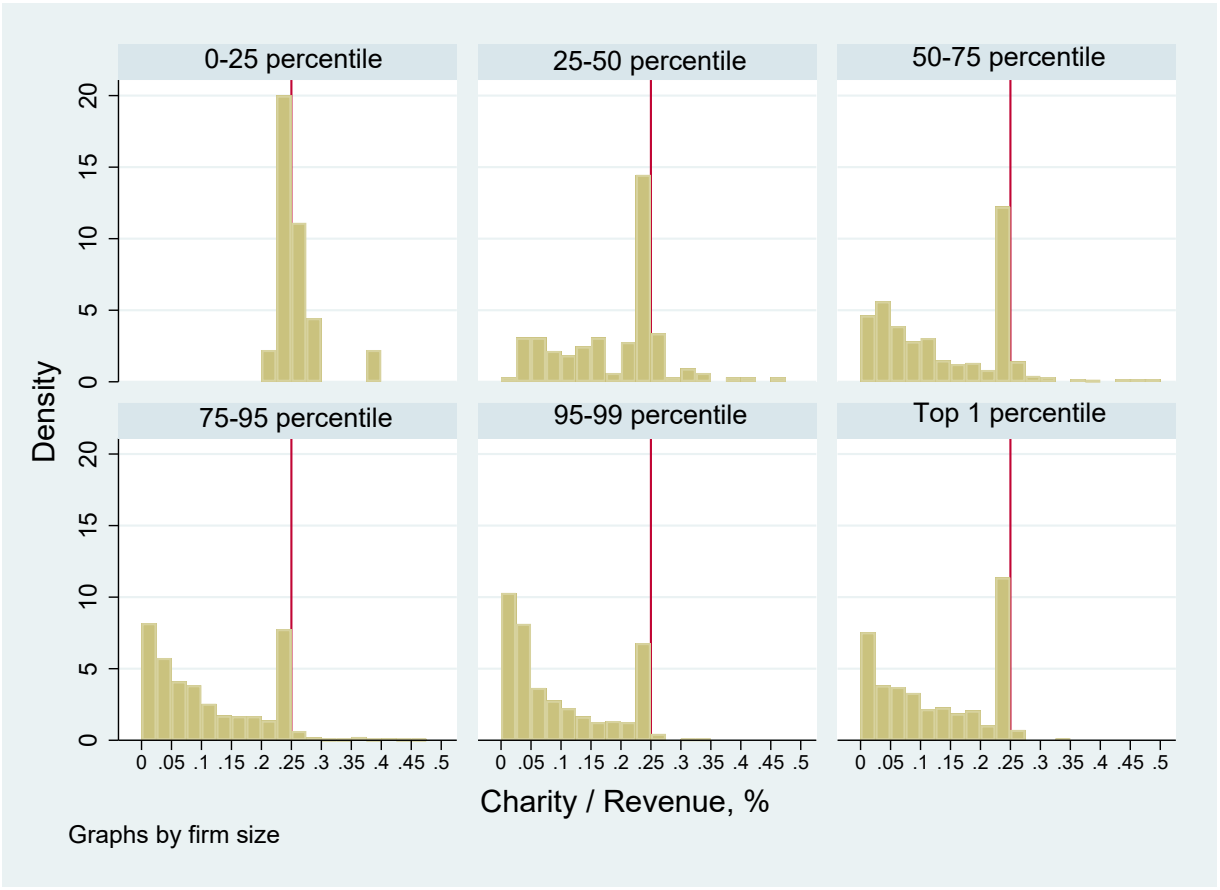
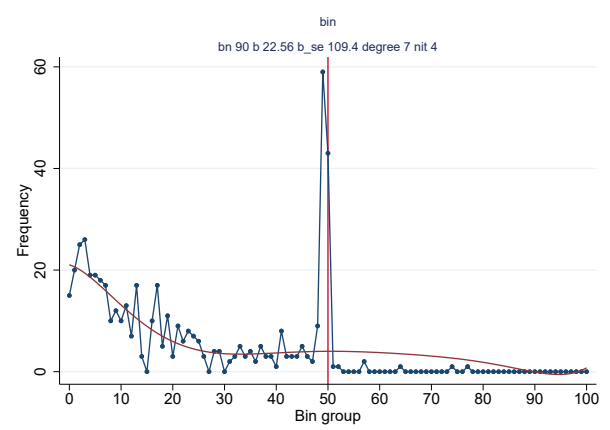
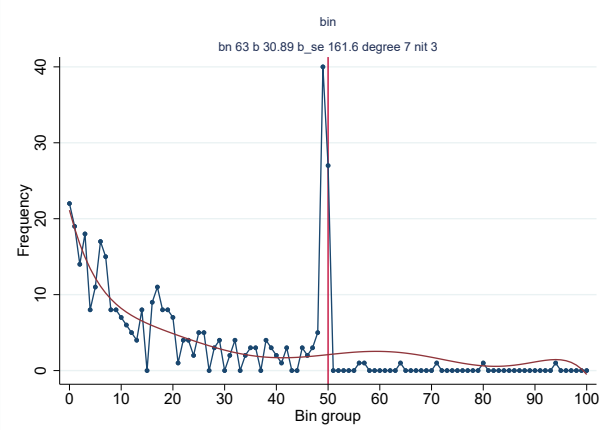


Figure A4: Bunching Analysis for Audited and Non-Audited Firms: Extensions

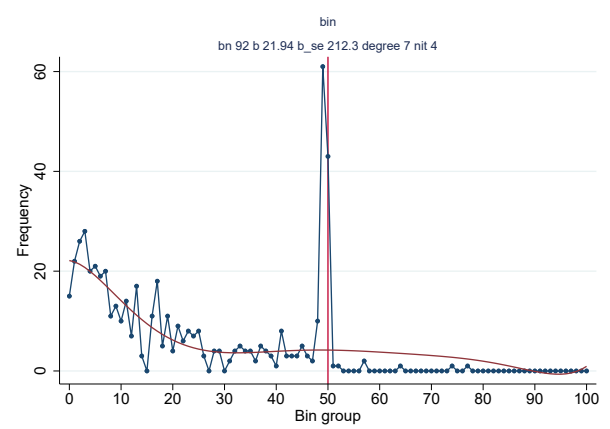
(a) Desk Audited



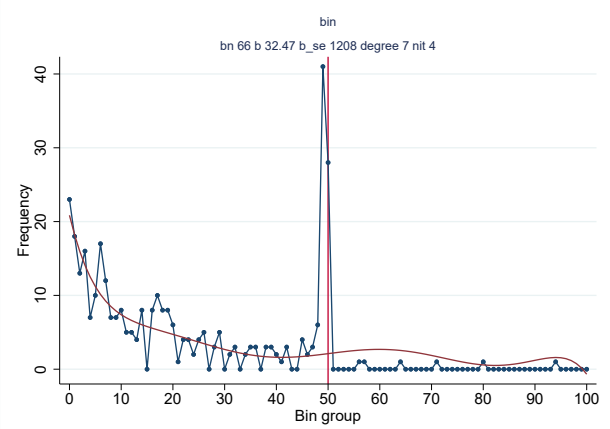
(b) Thoroughly Audited



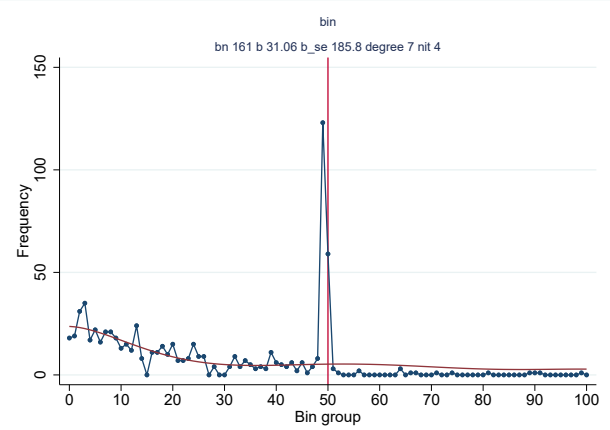
(c) Violation Not Found



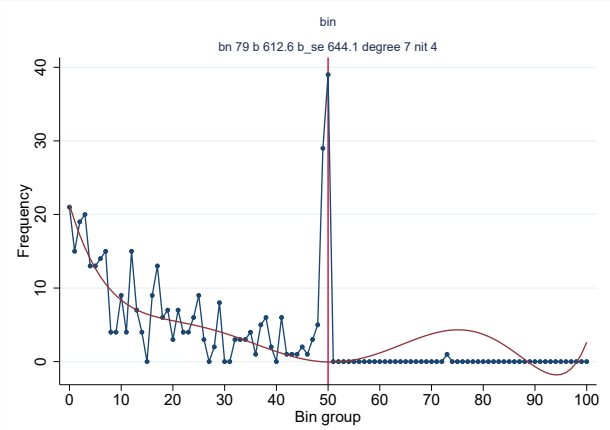
(d) Violation Was Found



(e) Not Audited in t-1



(f) Audited in t-1



Notes : This figure extends the analysis of Figure 6, which in term is a replication of the baseline estimate of Figure 5 by dividing the sample into firm-year observations that were either audited or not. Here, we split the sample into firm-year observations: a-b) that were subjected to desk or real audits, c-d) where a violation during an audit was found or not, and e-f) where an audit in the previous year was conducted or not.

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