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Ross Hickey
Brad Minaker
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Justin Smith

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Ross Hickey
Melbourne Institute: Applied Economic & Social Research
The University of Melbourne

Brad Minaker
University of Guelph

A. Abigail Payne
Melbourne Institute: Applied Economic & Social Research
The University of Melbourne

Joanne Roberts
Yale-NUS College

Justin Smith
Wilfrid Laurier University

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Melbourne Institute:
Applied Economic & Social Research
The University of Melbourne
Victoria 3010 Australia
T +61 3 8344 2100
F +61 3 8344 2111
E melb-inst@unimelb.edu.au
W melbourneinstitute.unimelb.edu.au

Abstract

Estimating the responsiveness of charitable donations to changes in tax incentives is more than estimating a single number. Giving to charity is unlike normal consumption – it involves supporting the delivery of privately-provided public goods. Age and income may influence how tax incentives to give affect both the decision to give as well as how much to give. Using a large administrative dataset from Canada to estimate the tax price elasticity of donations, we estimate that the tax price elasticity of charitable donations is -1 when it is restricted to be the same for all individuals. Across the income distribution, however, we observe an inverse U-shaped distribution in the elasticity that ranges from -1.4 to -0.18. We also find differences in the elasticity across age groupings, and that for the population the elasticity is driven more through the intensive than extensive margin.

JEL classification: H31, H24, H40

Keywords: Donations, charity, tax price elasticity

1. Introduction

Charities around the world provide important goods and services across a variety of sectors including social services, education, health care, the arts, and religion. While most charities may be classified as private providers of public goods, charity revenues often include direct and indirect support from the government. Indirect government support often comes in the form a tax incentive. Some countries (e.g. the US, Germany, Australia, and UK top income earners) permit one to offset taxable income with donations made to registered charities (a deduction). Other countries (e.g. UK) allocate government revenues to charities based on the level of donations received by the charity from tax payers (known as gift aid), while others (e.g. Canada and France) provide a tax offset that is equal to a percent of a donation given to a registered charity (a credit). By providing a tax incentive, instead of facing a $1 price of giving $d in total donations to charity the taxfiler faces a tax price of giving equal to $(1-t), where t represents the discount provided if the donation is claimed on one's tax return.[1]

Having a well-identified and precise estimate of the tax price elasticity with respect to giving is important for at least two reasons. First, it offers policy makers and researchers direct quantitative evidence of donor responsiveness to tax incentives like the ones described above. With a precise measure of the tax price elasticity of donations, government treasuries can more accurately forecast tax revenues and the cost of the charitable donations tax expenditure. Second, understanding how tax payers react to changes in the tax price of giving can inform decisions about how best to support the charity sector, especially in terms of considering the tradeoff between (a) direct government provision of the public good and (b) government support of the private provision of the public good, noting that government support can be in

[1] Andreoni and Payne (2013) provides the context for thinking about the role of the tax price elasticity of giving. Bakija and Heim (2011) provide a summary of the literature to that point.

the form of tax incentives and/or direct government subsidies to the charity (see, e.g. Andreoni and Payne (2013)).

The research so far has focused on measuring the compensated elasticity of giving, effectively asking the question: if there is a 1% change in price, how responsive are donations? Early research pointed to a range of results that suggests the elasticity of giving, ε, is close to −1. A few find an inelastic response, $|\varepsilon| < 1$, and Bakija and Heim suggest giving may most likely be elastic, $|\varepsilon| > 1$. Recent work by Duquette (2016) identifies a tax price elasticity of charity revenues of -4 using US charity information returns, while Backus and Grant (2018) estimate a tax price elasticity that is close to 0 using information gathered from respondents to the Panel Survey of Income Dynamics, though the estimates they produce are admittedly noisy.[2]

Research from outside of the U.S. has found estimates consistent with the ranges provided above: -0.2 to -0.6 in France (Fack and Landais, 2010) and -0.2 to -1 in the U.K. (Alumina et al., 2017). For the U.K., the tax incentive is equivalent to a deduction and it is applied only taxpayers earning to higher incomes. France offers a tax credit, like Canada, but the data used for the analysis was limited to records for only the top 10% of donors.

This paper contributes to and extends the literature that measures the tax price elasticity of giving by studying a random sample of tax filers in Canada for the period 2001 to 2016. We first demonstrate that the measured tax price elasticity across the entire distribution of tax payers is close to -1 for Canada. This effectively means that the tax incentive for giving is

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[2] Earlier U.S. estimates have ranged from: -0.5 to -0.08 (Randolph, 1995); -1.26 (Auten et al. (2002)); -1.76 for individuals whose income exceeds of $1 million to -0.61 for the average itemizing tax filer (Bakija and Heim (2014)). Hungerman and Wilhelm (2016) use both a regression-kink research design exploiting a state tax credit, and a match to estimate the tax price elasticity of giving and each yields an estimate of -0.2.

entirely passed on to charities as donations. As Canada is a country that provides a tax credit that can be applied across the entire distribution of tax filers, we provide an arguably cleaner and more comprehensive estimate of the elasticity.

We also measure the tax price of giving across the income distribution. U.S. estimates of the tax price elasticity use a selected sample of itemizers, which is driven by the fact that only itemizers can claim the deduction for charitable giving. Non-itemizers tend to have lower incomes, so these selected samples miss the lower tail of the income distribution. Because charitable giving is unlike normal private consumption in that often the gift serves a purpose of benefiting more than just the donor, it is likely that across the income distributions donors will react to tax incentives differently, so estimates that rely only on itemizers will not accurately reflect the elasticity among non-itemizers or the population in general. Recent evidence from the United States shows that there are large differences in the tax price elasticity of charity receipts for donations, with charities associated with health care receiving much larger revenue increases in response to tax price reductions than charities operating in other sectors (Duquette (2016)). By better understanding any differences in the elasticity across the income distribution, we can better develop policies designed to encourage giving.

We estimate the tax price elasticity across the income distribution and find evidence of a non-monotonic relationship between the tax price elasticity of giving and income across the income distribution. We document a large income elasticity of -1.5 (1.5%) in the lowest income quintile, which is primarily driven by the extensive margin effect for this quintile of households. The elasticity of giving then falls towards zero in magnitude as we move upward to the fourth quintile of the income distribution, then picking up again in the top quintile at -0.3 (0.3%). As we narrow our focus on the very top of the income distribution, we once again observe elasticities near -1 (1%) in magnitude among the top 1% and top 0.1% of income earners. Our initial finding that the elasticity is driven mostly through the intensive margin is

driven by the top end of the income distribution. Overall, our analysis suggests that the strongest responses occur at the tails of the distribution, creating an inverted u-shape when depicting the price elasticity of giving across the income distribution.

Finally, we explore the heterogeneity in the tax price elasticity across the age distribution. We find that the tax price elasticity of giving is larger in absolute value for younger tax filers, and there is a steady decline with increased age. The tax price elasticity is as high as -3 in the first age quintile and as low as 0 for the fifth age quintile. While the price effect is declining through the age distribution, the effect of income is increasing as we move through the age distribution. One important implication of these findings is that as the population ages, we expect that the tax incentive for giving will become less effective.

Separating this elasticity into intensive and extensive margin effects, we find that most of the elasticity can be attributed to the intensive margin of giving, namely affecting the level of giving versus the number of givers. This finding contrasts with those of Alumina et al (2017) in the UK and Backus and Grant (2018) in the US, who each find a greater extensive margin effect.

The remainder of the paper proceeds as follows. The next section describes the institutional setting. Subsequently we present our data and descriptive statistics and then our empirical strategy. This is followed up by our results, discussion of our results in the context of the existing literature and provision of policy recommendations before our conclusion.

2. Empirical Context and Data

2.1. Cleaner Estimate of Tax Price of Giving

The measurement of a tax price of giving based on a deduction from one's taxable income ("deduction") or a credit towards one's tax liability ("credit") is the same. Empirically, however, when the tax benefit is in the form a deduction in a progressive tax system such as

that observed in the US, estimating the tax price elasticity is challenging. This is because if one is near the threshold for moving from one tax rate to another, the reporting of a charitable donation can result in a shifting of the tax rate. Feldstein and Taylor (1976) recognized this problem and therefore the focus in systems using a deduction has been on using the "first dollar tax rate". In a system that relies on a credit, such as Canada, the estimation issue is not as severe.

The standard empirical specification for estimating the tax price elasticity for giving is:

$$Don_{ht} = \beta_0 + \beta_1 taxprice_{p(h,t)t} + x_{ht}\beta_2 + \omega_h + \gamma_t + \delta_{p(h,t)} + \delta_{p(h,t)} * trend_t + \varepsilon_{ht} \quad (1)$$

where *h* indexes households, *p* indexes provinces, and *t* indexes time. The subscript *p(h,t)* refers to the province where household *h* resides at time *t*. Don_{ht} captures the total cash value of donations as reported by the tax filer's household, *h*, in year *t*. In Canada, tax forms are submitted by individuals, but it is advantageous to report all donations on a single return, and thus these forms represent household giving. For the purposes of this study we aggregate key information at the individual level and use the household as our unit of analysis.

Our key measure of interest is the "*taxprice*" faced by the household. Canada provides a two-tiered tax credit system whereby the amount one can receive for a credit is tied to the donation amount, *not* the income of the donor. The tax price is a function of the combined credits available at the federal and provincial levels for the period in which the donation is made. Also included are a vector of time-varying household characteristics, *X*, a household fixed effect, a set of year dummy variables to capture macro level changes that might affect giving across Canada.

Equation 1 in the Canadian context overcomes the issue of a changing tax price under a deduction system (such as the US) and captures time invariant characteristics of households that might drive decisions around giving. An OLS estimation might still suffer from omitted variable biases attributable to information that we do not measure. More importantly, however, is a simultaneity problem because the tax credit is a two-tiered system in which the credit provided depends on the level of the donation. We therefore employ an instrumental variable estimate strategy to predict the price of giving linked to cross-provincial time variation in the credit.

The precise amount of the credit depends on your province of taxation and the level of the gift: the federal and provincial governments each independently tax income and have separate tax credits. Across all jurisdictions, one rate applies for donations less than $200 and a larger credit is applied to donations above $200.[3] These credit schedules define the price of giving each additional dollar. In Alberta, for example, the 2015 combined federal/provincial tax credit is 25 cents on each dollar donated under $200, which reduces the price of donating $1 to 75 cents. The credit then climbs to 40 cents on every dollar donated in excess of $200, reducing the price to 60 cents. For some provinces the two tax credit rates are tied to the lowest and highest marginal income tax rates even though the credit is given based on donation.[4]

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[3] The Canadian federal government defines the tax base through its determination of what constitutes taxable income. Each province, however, has jurisdiction to introduce deductions, credits, and marginal tax rates that can be applied to this income.

[4] The federal tax credit for charitable donations is tied to the federal marginal tax rates in addition to the provincial tax credit rates for the following provinces: British Columbia, Manitoba, New Brunswick, Newfoundland, Nova Scotia, Ontario, Prince Edward Island and Saskatchewan. Provinces have also on occasion deliberately changed the tax credit in order to try to increase giving (for example Alberta in 2007).

Our first stage regression estimates the price of giving as follows:

$$Taxprice_{p(h,t)t} = \alpha_0 + \alpha_1 lowcred_{p(h,t)t} + \alpha_2 highcred_{p(h,t)t} + x_{ht}\alpha_3 + \theta_h + \mu_t + \pi_{p(h,t)} + \pi_{p(h,t)} * trend_t + \xi_{ht} \qquad (2)$$

Our instrumental variables for the tax price are constructed using variation in the tax combined federal/provincial credit rates available donations below the threshold (*lowcred*) and above the threshold (*highcred*). As noted above, the credit available in Canada depends on the level of the donation (above or below $200) and the province of residence because credits are established by both federal and provincial tax authorities. The tax price in Canada is, therefore, a simple piece-wise linear function of the amount of funds donated, with a parameterization of the schedule varying over time and across place. These parameters are not tied directly to an individual's marginal income tax rate or their income, allowing us to exploit the mechanical nature of the tax price schedule as an instrumental variable estimator.

2.2. Capturing Entire Distribution of Tax Payers

Relying on Canadian data to measure the tax price elasticity is arguably better than relying on US data given that in the US context a donor only receives a deduction for her giving if she itemizes her deductions instead of taking the standard deduction provided by the government. Thus, with US data, one can only measure tax receipted charitable giving if one itemizes her deductions. This results in a non-representative population being studied. Historically, the key drivers of itemized deductions for most Americans are owning a home with a mortgage (mortgage interest is deductible) and/or residing in a high state income tax state.

Under the Canadian system, tax credits are available to anyone with a positive tax liability. Nearly everyone files income taxes in Canada: in 2017, 27.5 million Canadians filed a tax return, relative to an adult population (those 18 and above) of about 28.4 million people (Government of Canada, 2017, 2019). It is required if you owe tax to the government, and it is

also desirable for most Canadians that do not owe tax because it facilitates their access to refundable tax credits, including the GST tax credit, a means-tested transfer to eligible tax filers.[5] The tax price is, therefore, a universally meaningful measure for all tax filers who may be net payers to either the provincial or federal governments.

2.3. Simplicity of tax treatment of donations

A third challenge faced by many of the papers that have been previously published is that complexities in tax enforcement can influence behavior and affect responses to changes in the tax code. This point is in Slemrod (1998) and echoed by Kopczuk and Slemrod (2002). Fack and Landais (2016) empirically demonstrated the issue, establishing that a tax rate elasticity is not the only margin of influence over individual behavior. They demonstrated that a tax elasticity captures the behavioral response of the measured entity to a change in tax only when all other features of the tax system remain unchanged. Kopczuk (2004) demonstrated that it is quite uncommon for an assumption of no other changes in the tax system at the time of a tax change to hold true in practice. For example, Gillitzer and Skov (2018) demonstrate that the introduction of third-party reporting in Denmark resulted in the near doubling of the number of individuals claiming the charitable subsidy (Gillitzer and Skov (2018)).

The Canadian context enables us to exploit exogenous variation in the tax price that is unrelated to changes in the enforcement of the tax code and the information available to tax filers. Our study covers the period subsequent to a tax reform that simplified the tax code (Milligan (2016)). Apart from Quebec, which we exclude from our analysis, all (federal and

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[5] For example, in 2001, this credit provided between $207 and $316 to all tax filers with income below $26,941 depending on their marital status. These credits increase as the number of children in a household grows and decrease at 5% on family income (net) over the $26,941 threshold.

provincial) tax enforcement is uniform by the Canada Revenue Agency. By using a tax setting that is the same across all jurisdictions, we are able to exploit the same exogenous variation facing individuals throughout the income and donation distributions.

2.4. Data used for this study

Our study permits us to estimate the tax price elasticity of giving for the full distribution of tax filers. We utilize the longitudinal administrative databank (LAD), which captures a random 20% sample of tax filers for the period under study, from 2001 to 2015.[6] The LAD is specifically designed as longitudinal, meaning that once a person is sampled, they remain in the dataset until they are no longer able to be followed by the tax authority-- due to death, for example. To maintain the 20% sample from the larger database, in each year the LAD is refreshed with additional randomly sampled tax filers each with a 1/5 chance of being selected.[7]

Our sample universe consists of 50% subsample of all tax filers in the LAD aged 25-64, who live in in one of the 10 provinces (excluding territories), who were not deceased during the tax year and did not file for a deceased person during the tax year, for the time period 2001-

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[6] Although the LAD captures data back to, we focus on a shorter period to permit the analysis to capture a period when only tax credits were available for donations.

[7] The LAD contains a wide variety of variables reported on an individual's tax record, including income, taxes payable, tax credits claimed, deductions, contributions to retirement plans, and government benefits received. There are also many demographic and location characteristics, including age, sex, marital status, family size, family type, number of children, immigrant status, and postal code where the person resides. Most relevant for our research is that the data report total allowable charitable donations, which consists of the sum of a filer's total charitable contributions, gifts to government, cultural donations, and ecological gifts claimed for a tax credit. To the LAD we add information about the tax credits available to filers in each province in each year. These values were collected directly from federal and provincial tax forms.

2015.[8] We focus on a 50% subsample of the LAD (which means we have a 20%*0.5 = 10% sample of tax-filers) rather than the entire sample for computational and other reasons.

From this sample set, we exclude all observations from tax-filers if they move provinces at any time while they are observed. We make this exclusion because we are concerned that movers would introduce endogenous variation into the tax price. Suppose, for example, that an individual moves from Alberta to British Columbia to work for the same company at the same salary. Because British Columbia has a less generous tax credit, the individual would face a higher price for donations. Suppose also that because moving is expensive, the individual donates less. Even controlling for individual fixed effects, this would make it look as though raising the tax price lowers donations, even though the underlying cause was related to unobserved factors. By removing movers, we eliminate this sort of variation. In sensitivity checks we include the movers and show that the tax price effect is slightly smaller in magnitude.

The sample universe has 247,559,930 observations weighted to population totals. We exclude 20,497,205 observations (8.3%) by excluding movers, leaving us a final analysis sample of 227,062,725.

Our two main dependent variables are the logarithm of the sum of allowable annual real charitable donations by a household and a zero/one indicator variable that identifies if the household reported donations for the tax year under study. We use the spousal total because

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[8] Though the LAD consists of records from 1983 onward, we restrict our analysis to 2001 onward because that is the point in time when all provinces adopted the "tax on income" approach to provincial income taxation. We drop the territories from our sample because they still use this tax on tax system. Tax-filers whose spouse died during the tax year, people filing on behalf of deceased individuals, and deceased individuals themselves are all excluded from the sample as there are complications in the way that their taxes are filed.

donations are transferrable for tax purposes, and therefore most will have a single spouse claiming most or all donations.

The key independent variable is the natural logarithm of the last-dollar tax price of giving, which is defined as one minus the combined federal/provincial credit applicable to the last dollar donated. To determine the appropriate tax price for the household, we use the lowest price that they could claim given the donations they each report on their returns. For households who owe no federal or provincial taxes and who donate zero, we assign a tax price of 1, because they cannot receive the non-refundable credit. For filers who owe no taxes but have positive donations, we assign the relevant last-dollar price given their donation, under the assumption that their donation drove their taxes owing to zero.[9]

One of the main components of our analysis is measuring the tax price elasticity across the five quintiles of the income distribution, and also at the top 10%, 1%, and 0.1%. In our main analysis, income quintiles are computed by pooling all observations in the sample. There are several different income measures in the LAD that we could use for our exercise. We focus primarily on total pre-tax income, a measure derived by Statistics Canada which effectively equals market income plus government transfer payments.[10] Importantly, this income measure excludes capital gains/losses, which we include as a separate measure in the analysis.[11] We

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[9] Because it is transferrable across time, while other non-refundable tax credits are not, the donations tax credit is likely the last one that filers will claim.

[10] See Table 4 in the LAD documentation for the specific components of this variable (called XTIRC). Summarizing information from that table, the income measure includes all types of employment income, other types of income like dividends and rental income, and government transfers such as old age security, refundable tax credits, social assistance payments, child benefits, and the working income tax benefit. As mentioned above, it excludes capital gains.

[11] We excluded capital gains/losses because this has the effect of occasionally making a person with high employment income, but a big capital loss, seem like a low income person. This tended to

check the robustness of our results to separating people into income groups using different income measures and different ways of creating the groups and show that our main results are insensitive to these changes.

3. Tax Treatment of Donations in Canada

Figure 1. presents a time series for both the low and high credit rates for all provinces in our sample since 2001. While some provinces-- like Prince Edward Island, Ontario, and New Brunswick-- display little variation in either credit rate, others show more substantial changes. For instance, in Alberta there was a very large and permanent increase in the high credit rate in 2007. In Nova Scotia there are two smaller increases in the high credit rate. And in Newfoundland there is gradual but large reduction in both the high and low credit rates between 2007 and 2011.

Figures 2 depicts the provincial average donations per household over time as measured in 2015 dollars. Figure 3 depicts the probability of giving from 2001 to 2015, overlaid on top of the combined annual tax prices. These graphs indicate several noteworthy patterns. First, donations in 2015 are below their peak for every province in Canada, and many provinces experienced a peak in average donations at different points in time. For example, Nova Scotia topped out in 2004 while Alberta did so in 2010. This variation in donation behavior could be the result of many factors, like unintegrated provincial business cycles, for example. It is also evident that there is much more variation in average donations in some provinces than in others, more variation in average donations in Alberta and Nova Scotia than the other provinces, and all Atlantic provinces except Nova Scotia exhibiting relatively little change in average donations over the 14-year sample period. Also noteworthy in these figures is that in every

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obscure the people who were in the lowest quintile. Because we still think it is important to hold his measure constant, we include it separately in the regressions.

province the fraction of filers who donate has been falling since roughly 2007-08. This could be related to the financial crisis, though the fraction of donors has not recovered since that time. It could also relate more to changes in the age distribution of the population.

Table 1 presents basic summary statistics on donation behaviour for the full sample and stratified by different quantiles of the pre-tax income distribution. Panel A of Table 1 focuses on all households. Looking first at the propensity to give, approximately 40% of households claim donations on their tax return in any given year. This is in sharp contrast to the 84% of respondents to the 2007 and 2010 Canadian Survey of Giving and Volunteering who claim that they have made financial contributions to charities but is similar to the 46% of respondents who stated that they intended to claim the donations tax credit (Turcotte,2012). Across the sample period, 66% of households claim the charity tax credit at least once.

Across the income distribution, the fraction of tax filers that claim donations increases monotonically by income quintile, with 7% of the bottom 20% of income earners claiming donations, and 72% of the top 20% of income earners claiming donations. The increasing rate of reporting donations by income grouping should be expected given the non-refundable quality of the tax credit. Looking further at the extensive margin of giving behavior, we see that 78% of the top 10% of income earners claim donations on their tax return as do 87% of the top 1% of income earners, and 89% of the top 0.1% of income earners.

The mean donation across all filers, which includes givers and non-givers, is roughly $650. The average donation increases monotonically from $50 to $620 across the first four income quintiles, and then jumps more substantially to $1900 for the top income quintile. This is driven by very large giving behavior among top income earners: the highest 0.1% give just over $69,000 per year.

Looking deeper at the distribution of donations for the whole sample and within income quintiles, some interesting patterns emerge. Here we observe that it is only as we enter the 4th income quintile that more than 50% of tax filers in that quintile claim donations. We also observe that even among people in the second and third income quintiles, the 90th percentile gift is relatively substantial, at $350 and $750 respectively. Finally, among top income earners, there is a very wide distribution of gifts: 75% of those tax-filers in the top 0.1% give $690 or more, while 10% give $85,100 or more.

Panel B of Table 1 describes donation behavior for households, conditional on donating. Here, it is striking that the 90th percentile of donations for donors in the bottom 20% of income earners, $1600.00, exceeds the 75th percentile for the top 20% of income earners, $1300.00. This suggests that although donations are clearly an increasing function of income, there are very generous individuals throughout the distribution of income. It is also quite clear that the donation behavior of the top 1% of income earners is of an order of magnitude larger than that of the bottom 20% of income earners with 10% of the top 1% of income earners donate at least $21,800.00 – a measure that surely exceeds the income threshold for the bottom 20% of income earners! It is also noteworthy that there is a significant fraction of people within each quintile that face the high credit rate, low tax-price when deciding on the last dollar donated.

Table 2 presents summary statistics for the covariates used in our regression analysis. The average age of tax-filers in our sample is 45. 70% of our sample is married and the average number of children in a household is about 1. As with donations, we measure income at the household level. The median total pre-tax income per household in 2015 dollars in $67,800, and the mean is $87,000 reflecting the right skew in earnings. The mean of capital gains/losses is $2400.00. Given the skewness displayed in the distribution of donation behavior, this number

suggests that some of the top donors are constrained by the $75,000.00 limit on their annual donations tax credit claims.

4. Results

4.1. Baseline Results

In Table 3 we present the results of our regression analysis. In column 1 we report the results using an OLS specification. In columns 2 to 4, we report the results from an IV specification using as an instrument for the log tax price measures that capture the variation in the highest and lowest provincial marginal income tax rates. For columns 1 to 3, we compute the standard errors based on a clustering of the census subdivision in which the household is located. The clustering at this level of geography captures the variation that is associated with community characteristics. For column 4, we report the estimates if we cluster the standard errors at the province level. For all specifications, we include a household fixed effect, a yearly time trend, and measures to capture the number of children in the household and whether the unit of observation is for a married couple or a single tax filer. For the purposes of comparison, however, in column 2, we do not include household fixed effects. We report the coefficients for the age of the taxfiler**,** the log of pre-tax income and the level of reported capital gains and losses.

Starting first with the OLS estimation. The estimated elasticity of donations with respect to tax price is -9.3, which highlights the significant bias introduced by simultaneity between donations and the tax price, owing to the discrete drop in the tax price at the $200 giving threshold. Using an instrumental variable specification we obtain a coefficient that is closer to -1. If we exclude household fixed effects, the magnitude is -1.3. Once we include the household fixed effects and instrument for the tax price, the tax price elasticity is close to -1.04. This result is in line with previous literature. The standard error calculations for columns 3 (census subdivision) and 4 (province) illustrate that precision of the estimate drops if we

cluster at a higher level of aggregation. A discussion of the strength of our estimator, and an exploration of alternate instrumental variables estimators, along with the reduced form regression estimates are available in the Appendix.

The downside to increasing the tax price effect on donations could in theory come from donors reducing their donations and/or ceasing to donate altogether. Given the richness of our data we can explore the efficacy of the tax price on both the extensive and intensive margins. Hickey et al (2019) found that taxpayers in Canada are sensitive to the salience of the tax price which means that changes in the visibility of the tax price impact donations on both the intensive and extensive margins. Table 4 reports the results from an analysis that separates the intensive and extensive margin effects. In column 1 we report the results when the regressions include only those households observed donating, the intensive margin. The tax price elasticity along the intensive margin is about -0.76, which is about 25% smaller than the total elasticity.

In column 2, we report the results for the sample of all households but change the dependent variable to an indicator variable that is equal to 1 if the household reports donations on the tax return. The results suggest that increasing the tax price by 1% lowers giving by 0.04 percentage points. We can translate this coefficient into an implied elasticity of -0.10 (the ratio of the coefficient estimate to the fraction of donors). Taking these results together, our evidence suggests that the majority of the tax price effect operates through reductions in donations (intensive margin) rather than reductions in donors (extensive margin).

4.2. Estimates Across Income Distribution

One of the drawbacks of many U.S. studies using administrative tax data to estimate tax price elasticities is that they are limited to itemizers – referring to those who have enough deductions to exceed a standard deduction available to everyone. This group tends to be higher income, and as such these studies typically miss the lower part of the income distribution. By contrast,

the tax credit is available to anyone in Canada; if they have taxes owing, which allows us to capture donors from across the whole income distribution.[12]

Table 5 presents estimates of the tax price elasticity for both the full sample and for donors, in addition to an estimate of the extensive margin effect, using our preferred specification. Surprisingly, we see in Panel A that the tax price elasticity is primarily driven by the lower and top income quintiles but not in the middle (quintiles 3 – 4). This contrasts with the findings of Bakija and Heim (2011) and may be explained by the Canadian tax code's feature of making the non-refundable tax credit accessible to all tax filers. This "U-shaped response" however is consistent with estimates from the US produced by Boskin and Feldstien (1977).

Panels B and C separate the intensive and extensive margin effects in the response of donations to the tax price. In Panel B we see a relatively flat tax price elasticity hovering around -0.6 across the income distribution, apart from a *positive* elasticity among filers in the lowest quintile. Comparing this to the extensive margin effects in Panel C, the implied elasticity of tax price in the lowest income quintile with respect to giving any amount is -4.12. In this lowest quintile, the results suggest that a big reduction in donors from increases in the tax price is primarily responsible for the reduction in total donation amounts. In the second income quintile the intensive and extensive margin effects are roughly similar. In other quintiles, the tax price elasticity is mostly an intensive margin effect.

Narrowing in on the very top of the income distribution, in Panel A we see that the top 10% of earners have an elasticity of about -0.6, while the top 1% and top 0.1% have elasticities of more than -1 in magnitude. In all three of the top income groups, the estimates in Panels B

[12] In fact, when a tax filer has no taxes owing the credit can be banked and applied to a future tax obligation up to five years in the future.

and C suggest that the response of donations to the tax price happens mostly along the intensive margin. That we see some evidence of positive tax price effects on decision to donate for the fourth and fifth quintiles is very surprising. As we dig deeper into the top of the distribution these counterintuitive effects disappear and we see negative price effects for the top 1% and 0.1%. It is worth noting that in the top two quintiles of the income distribution, most households are donors already. With our fixed effects estimator, all identifying variation is coming from households that previously never donated, stopped donating, or non-uniformly donated. We leave exploring this further to future research.

Overall, what we learn from Table 5 is that there is substantial heterogeneity in the tax price response of charitable giving across the income distribution. The overall elasticity at each quintile, also masks the heterogeneity in responses with respect to the intensive and extensive margins. For lower income households much of the response is on the extensive margin, while for higher incomes it is coming from the intensive margin. Similarly, we see uniformly positive income effects across the income distribution and for both the intensive and extensive margin. The robustness of our estimates to the choice of income definition used to assign individuals to income quantiles is discussed in the appendix with reference to Table A5.

4.3. Estimates Across Age Distribution

As households age, their preferences may change— also when we condition upon important determinants of giving that change across time like income and number of children in the household. Overall, giving is higher on average as households age. Table 6 presents estimates of the elasticity of donations to the tax price of giving through the age distribution, again focusing on quintiles. Here, we see that the response to the tax price is strongest for the young, with a tax price estimate of almost -3 for the bottom 20% of tax filers in terms of age. As households age, their sensitivity to the tax price declines to effectively zero as they near the top 20% of tax-filers in terms of age. This feature is also depicted in Figure 4, suggesting that

altering tax incentives in Canada will on average alter the giving behavior of only the youngest 60% of the population. As the baby boom generation moves through the age distribution, this suggests that in the upcoming future tax incentives for giving will become less effective in generating additional donations, and we should expect to see a smaller average tax price elasticity of giving on average.

What is also interesting from Table 6 is that we see an inverse relationship between the responsiveness to price and the responsiveness to income. While donations are decreasing due to price as we move through the age distribution, they become increasingly responsive to income. The income elasticity of pre-tax income for households in the fifth quintile of the age distribution is almost three times the size of that for the first age quintile. As we consider charitable giving in an aging population, fostering increased employment earnings in the upper parts of the income distribution may be another way to grow the charitable sector.

5. Discussion

Some laud the neutrality of the charitable donation tax credit as a means of subsidizing the financing of privately-provided public goods. Our research suggests that such claims require caution. The heterogeneity displayed in our estimates suggest that some charitable causes benefit more than others from this form of support. In particular, donors whose tax price elasticity is less than one in absolute value are receiving a subsidy to their own consumption, while those charities whose donors have a tax price elasticity exceeding one in absolute value generate more revenue through the tax credits. As shown in Duquette (2016), some charities and segments of the charitable sector benefit more than others from reductions in the tax price of giving. Furthermore, if government grants crowd in tax-receipted giving, as Andreoni and Payne (2013) have demonstrated is the case in Canada, then there is a strong case for further depoliticizing the allocation of government grants to charities. One way to achieve this would be to establish independent, grant adjudication panels that operate at an arm's length.

It is worth questioning whether our measured effects are due to a pure price effect or may just be the result of information frictions. As demonstrated in Hickey et. al (2019), there is evidence of a general lack of salience of the tax price of charitable giving in Canada. Bordalo et. al (2013) demonstrate how price changes can produce counterintuitive consumer responses in such an environment. The reason is that a less salient price becomes more salient at the time of a price change. Depending on a consumer's prior estimate of the price, and the difference between the estimate and the newly more visible price, the reaction may be of the opposite sign to the price change itself. This certainly could explain some of the opposite signed elasticity estimates that we have found.

Similarly, while the enforcement and complexity of the tax code is uniform across individuals in our study there could be variation across individuals in their willingness and ability to access the credit. This could be due to heterogeneous tax filing costs across the income or age distribution. The pattern of tax price elasticity estimates across the age distribution are consistent with tax filers learning of the tax credits over time. Similarly, if all tax filers wish to avoid taxation but experience heterogeneity in their access to further opportunities to reduce their tax bill we may see a pattern similar to what we see across the income distribution. There are fewer tax credits available to income earners at the bottom of the distribution than at the top, making the charitable gift the easiest to access as it simply requires a receipt. Whereas many other tax credits are targeted to households with children, post-secondary students, home-owners, and investors in particular industries. At the very top of the income distribution where the demand for tax credits may be greatest because tax liability is greatest, the charitable deduction remains the most fluid means to reduce taxation as the cap is 75% of one's annual taxable income. Further to this point, the willingness and ability to shift both the making of donations and the claiming of credits across time is likely greater for those of higher incomes with access to more and better tax planning advice.

Our results present a positive empirical analysis of the effect of tax price on donations behavior. There are an interesting normative question raised by this work as well – who should bear the burden of taxation? And how should we distribute the benefits of charity subsidies across charities? The first question has been considered by Saez (2004) in a model of impure altruists and Diamond (2006) in a model of warm glow givers. Neither work speaks directly to an optimal policy target for the tax price, but each make strong cases for the rate to be non-zero. Saez (2004) using a framework in the absence of adverse selection suggests that the tax price should be decreasing in the magnitude of the tax price elasticity, the level of crowd-out, and the size of spill-overs from charitable goods produced. Taking a different optimal taxation perspective, Diamond (2006) shows that, in the presence of adverse selection, allowing donations to be subsidized would relax the incentive compatibility constraint of the high type workers, while also increasing the public good. These features combined suggest a tax price less than $1 for the high type of income earner. In the presence of warm glow-givers, there is less scope for differences between the tax price of giving across workers as the magnitude of contributions increases for the high-type further weakening the incentive compatibility constraint. This suggests that the two-tiered credit for charitable donations in Canada has some merit. While neither study explored heterogeneity in the public good provided, it is worth considering from a normative perspective as well.

If charitable giving is a normal good with heterogeneous charities and donor preferences-- which our estimates strongly suggest-- then our two-tiered credit rate could reduce vertical equity in society. Higher income individuals can enjoy more of the warm glow from donations at a lower price than lower income individuals whose donations do not reach the higher credit threshold. Though the foregone revenue from the donations tax credit benefits all of society through the good works of charitable organizations there remains cause for concern. First, high income individuals may enjoy donating to charities that produce more club

goods that exhibit a degree of exclusivity – for example a private school. Second, since we find evidence of heterogeneity in the price elasticity of donations, it is less than one for some tax filers and those individuals are enjoying some of their tax savings by allocating it away from public goods and towards private consumption. To the extent that high income earners already enjoy better tax planning advice to avoid some of the burden of taxation, it is increasingly difficult to justify the two-tiered credit. Future research examining the theoretical basis for such a system of tax credits would be useful to inform the policymakers.

Our study required the assumption that all donations were being reported in the year in which they were made. This assumption was necessary as we have no reporting of individual donations from receiving charities. To the extent that donations are under-reported, our estimates will remain consistent – though they will be imprecisely estimated (Kennedy, 2012). There is greater cause for concern regarding the under-reporting of donations. There is money being left on the table – in this case in the government coffers – because of tax filer administrative costs. Placing the administrative burden on charities to report an information return for each donor would be costly for charities, but if society is already subsidizing charitable giving through grants and tax expenditures, then pooling the administrative costs to increase the efficacy of the donations tax credits would be less costly to society to the extent that having a charity report for all donors would be less burdensome than having each individual donor make a report. We know that donors are not claiming all the tax credits available and some of our measured inelasticity of the supply of donations may be partially attributable to tax-filers not reporting donations for which the gains of doing so are smaller than the cost of record keeping (Benzarti (2015), Rehavi and Shack (2013) and Tazhitdinova (2018)). This low take up is welfare gains on the table and is a signal of costly compliance, and not just a form of forgone revenue. Such a practice may also nudge donors to donate more as this cost would be removed.

6. Conclusion

We document that the tax price elasticity of charitable giving is roughly -1, though there is substantial heterogeneity across the income and age distributions. More specifically, the strongest response to the tax incentive is from low income individuals, very high-income individuals, and the younger demographic. This suggests that among some subgroups of the population, the tax price is an important determinant of giving. Clean estimates of the tax price of charitable giving for the average tax filer and across the income distribution are difficult to achieve in many countries – the U.S. in particular - since the tax price is a function of income, and because samples are sometimes limited to higher income individuals. Fortunately, in the context of Canada, the tax price depends only on donations and on legislated tax credit rates that vary frequently over time within provinces– allowing us to identify the tax price elasticity of charitable giving by instrumenting with the tax credit rates.

While we provided an extensive analysis of heterogeneity of the tax price elasticity of charitable donations there is ample scope for future research in this area. First, while we explored the heterogeneity through the income and age distributions, one may wish to explore heterogeneity through the distribution of donations itself. Indeed, an exploration of quantile regression methods would be interesting. Our instrumental variable approach could be modified and applied in that context. In addition, the kink in the price schedule at the $200 donation threshold could be exploited using a bunching estimation framework as employed by Benzarti (2017). Finally, an exploration of intertemporal giving and credit claiming and how these activities relate to tax price would be an exciting new direction of study. Such an endeavor could be a great complement to the existing literature.

References

Andreoni, James (2006). “Philanthropy.” In Kolm, S.-C., Mercier Ythier, J. (Eds.), Handbook of Giving, Reciprocity and Altruism (pp. 1201–1269). Amsterdam: North Holland.

Andreoni, James, and A. Abigail Payne. “Charitable giving.” Handbook of public economics. Vol. 5. Elsevier, 2013. 1-50.

Auten, G., Sieg, H and Clotfelter, C (2002). “Charitable giving, income, and taxes: an analysis of panel data.” *American Economic Review*, 371-382.

Bakija, J. and Heim, B.T. (2011). “How does charitable giving respond to incentives and income? New estimates from panel data.” *National Tax Journal*, 64(2), 615-50.

Bertrand, M., Bombardini, M., Fisman, R. and F. Trebbi (2018). “Tax-Exempt Lobbying: Corporate Philanthropy as a Tool for Political Influence.” NBER working paper No. 24451.

Bordalo, P., Gennaioli, N., and Shleifer, A. (2013). “Salience and consumer choice.” *Journal of Political Economy*, *121*(5), 803-843.

Boskin, M. J., and Feldstein, M. (1977). “Effects of the charitable deduction on contributions by low income and middle income households: evidence from the national survey of philanthropy.” *The Review of Economics and Statistics*, 351-354.

Devlin, R. A. (2017). “Charities and Political Activities (A Tempest in a Teapot?).” *Canadian Tax Journal*, 65(2), 367-378.

Diamond, P. (2006). “Optimal tax treatment of private contributions for public goods with and without warm glow preferences.” *Journal of Public Economics*, *90*(4-5), 897-919.

Duquette, N. J. (2016). “Do tax incentives affect charitable contributions? Evidence from public charities' reported revenues.” *Journal of Public Economics*, 137, 51-69.

Fack, G., and Camille L. (2010). “Are tax incentives for charitable giving efficient? Evidence from France.” *American Economic Journal: Economic Policy* 2(2), 117-141.

Feldstein, M., and Clotfelter, C.T. (1976). "Tax Incentives and Charitable Contributions in the United States: A Microeconometric Analysis." *Journal of Public Economics*, 5:1-26.

Feldstein, M., and Taylor, A. (1976). "The Income Tax and Charitable Contributions." *Econometrica*, 44:1201-22.

Gillitzer, C., and Skov, P. E. (2018). "The Use of Third-Party Information Reporting for Tax Deductions: Evidence and Implications from Charitable Deductions in Denmark." *Oxford Economic Papers*, 70(3), 892-916.

Government of Canada (2017). "Canada at a Glance 2017: Population". https://www150.statcan.gc.ca/n1/pub/12-581-x/2017000/pop-eng.htm. Accessed on May 15, 2019.

Government of Canada (2019). "Individual Income Tax Return Statistics for the 2019 tax-filing system". https://www.canada.ca/en/revenue-agency/corporate/about-canada-revenue-agency-cra/individual-income-tax-return-statistics.html. Accessed on May 15, 2019.

Hickey, R., Minaker, B. and A.A. Payne (2019). "The Sensitivity of Charitable Giving to the Timing and Salience of Tax Credits," *National Tax Journal*, 72(1), 79-110.

Hossain, B., and Lamb, L. (2014). An assessment of the impact of tax incentives relative to socio-economic characteristics on charitable giving in Canada. *Applied Economics*, *29*(1), 65-80.

Meer, J. (2014). "Effects of the price of charitable giving: Evidence from an online crowdfunding platform." *Journal of Economic Behavior & Organization*, *103*, 113-124.

Milligan, K. (2016). Canadian Tax and Credit Simulator. Database, software and documentation, *Version* 2016-2.

Moffitt, R. (1990). “The Econometrics of Kinked Budget Constraints.” *The Journal of Economic Perspectives*, 4 (2): 119-139.

Randolph, W. C. (1995). “Dynamic income, progressive taxes, and the timing of charitable contributions.” *Journal of Political Economy*, 709-738.

Rehavi, M. M., and Shack, D. (2013). “Partial Reporting: An Example from Charitable Giving.” *Unpublished manuscript, University of British Columbia, Vancouver*.

Roberts, R. D. (1987). “Financing public goods.” *Journal of Political Economy, 95*(2), 420-437.

Saez, E. (2004). “The optimal treatment of tax expenditures.” *Journal of Public Economics, 88*(12), 2657-2684.

Taussig, M.K. (1967). “Economic Aspects of the Personal Income Tax Treatment of Charitable Contributions.” *National Tax Journal*, 20:1—19.

Tax Expenditures and Evaluations 2014. (2014). Finance Canada. Retrieved from http://www.fin.gc.ca/taxexp-depfisc/2014/taxexp1402-eng.asp

Tazhitdinova, A. (2018). “Reducing evasion through self-reporting: Evidence from charitable contributions.” *Journal of Public Economics, 165*, 31-47.

Appendix

The first stage and reduced form results for the instrumental variables regression with fixed effects and time trend is in Table A1. As noted above, the first-stage F-statistic is over 775, suggesting that the instruments are very strong. The coefficients on the instruments in the first stage are both negative as expected, and strongly statistically significant. Note that the tax credits are not logged, so the estimates suggest that moving the low credit from 0 to 1 reduces the tax price by 82%, while moving the high credit rate in the same way reduces the price by 48%. Why does the moving from no credit to full credit not reduce the tax price by 100%? This is because for donors who give less than $200- and therefore face the lower credit and the higher tax price- changes to the high credit have no impact on the tax price. Similarly, tweaking the low credit has no impact on donors who give over $200. The fact that the low credit rate has double the estimated impact on the tax price as the high credit rate suggests that most people in the sample get the lower level credit.

The reduced form estimates suggest that shifting both the lower and higher credit from 0 to 1 increases donations, but by different amounts. In part, the larger impact of the low credit rate on donations is driven by the fact that it has a higher impact on the tax price. To make these estimates comparable by adjusting the effects to equal changes in tax price, in Table A2 we estimate our preferred IV specification using variation in the tax price from only one tax credit instrument, which we operationalize by controlling for the other tax credit in the first and second stage. Using variation in tax price from the low credit rate only (controlling for the high credit in the first and second stage), we estimate an elasticity of -0.86, whereas when we focus on variation from the high tax price we estimate an elasticity of -1.11. A 1% change in the tax price coming from a change in the high credit rate has a slightly bigger impact on total giving. This is somewhat expected since people who face the higher tax price are already the bigger donors, a group that is likely sensitive to financial incentives to give more.

In our sample we removed inter-provincial movers because we worried that they would introduce endogenous variation in the tax price, even after instrumenting. Table A3 repeats our preferred estimates of the total tax price elasticity and the extensive margin when we include movers in the sample. The tax price coefficients are both smaller, but not by an economically significant amount. Movers are therefore not a major threat to identification of the tax price effect.

In Table A4 we consider several different estimates of the tax price elasticity across the income distribution with different income concepts. In Panel A, we separate individuals into quintiles based on their *after-tax* income. Results are very similar in magnitude to those using pre-tax income discussed in Table 5. In all the preceding estimates we compute the income quintiles with the pooled sample across all filers and time periods, but one could argue that computing the quintiles annually makes more sense because that is the way they are normally defined. In Panel B we instead create the income quintiles using total pre-tax income computed annually and show that the tax price elasticities are very similar to main estimates from Table 5. One issue with annual and pooled quintiles is that filers can move in and out of these quintiles over time, and it therefore does not represent a stable measure of their position in the income distribution. To see whether this influences estimates, in Panel C we compute quintiles from the pooled data but include filers in the regression if they were *ever* in that quintile. Thus, the same filers could potentially be included in several of Panel C quintile estimates. Most of the estimates are close to those in Table 5, except that the 3rd and 4th quintile estimates are bigger in magnitude and closer to -1, and the top 1% and top 0.1% estimates are somewhat attenuated.

To summarize, our results are qualitatively unchanged with small changes to our analysis sample and definition of income, and the quantitative differences are in all cases very minor.

Finally, filers can carry donations forward for up to 5 years to claim them for tax credits. Unfortunately, there is no information in the tax returns that tells us when a donation is made,

or whether it is a carry-forward from a prior year. For the purposes of our study we assume that all donations are being reported in the year in which they were made. This is likely a good assumption for some types of donors, but not necessarily others. Table A5 simulates two hypothetical donors who live in Nova Scotia in 2015, which has a low combined federal/provincial rate of 23.79%, and a high combined rate of 50%. For each hypothetical donor, we compare giving equal amounts annually to saving up across 5 years and giving in one lump sum. If a hypothetical donor gives $200 per year, they earn a tax credit of $47.58 each year, which adds up to $237.90 across all five years. If that same person instead saves up all their donations and gives $1000 in year five, they get a tax credit of $447.58, a 88% gain over annual giving scenario. For this person, it might seem worthwhile to save up donations, though it is still not clear whether it is worth saving the tax credit for such a long time for a $200 gain. A larger donor, on the other hand, faces a very small proportional gain to saving up donations. if a person gives $10,000 per year, they receive a credit of $4,947.58 annually, for a total of $23,737.90 over five years. Claiming all donations instead at the end of year five, the credit is $24,947.58, a gain of 0.85%. For this person, it seems clear that saving up donations is likely not worthwhile. Therefore, while we acknowledge that treating donations as being made in the year they are claimed might introduce error into our dependent variable, the incentives to save donations does not seem strong.

Table 1: Summary Statistics on Donations

	Full	Pre-tax Income Quintile					Top Income Group		
	Sample	1st	2nd	3rd	4th	5th	Top 10%	Top 1%	Top 0.1%
Panel A: All Households									
Fraction of households observed donating	40.0%	6.6%	26.5%	41.3%	54.0%	71.6%	77.5%	87.5%	89.0%
Mean Donation	$650	$50	$210	$420	$620	$1,900	$3,000	$14,200	$69,200
Standard dev. of donations	(14,282)	(2,050)	(1,275)	(1,726)	(2,506)	(31,662)	(44,589)	(138,634)	(420,627)
10th Percentile of Donations	$0	$0	$0	$0	$0	$0	$0	$0	$0
25th Percentile of Donations	$0	$0	$0	$0	$0	$0	$20	$280	$690
50th Percentile of Donations	$0	$0	$0	$0	$20	$160	$300	$1,600	$5,000
75th Percentile of Donations	$140	$0	$20	$120	$250	$780	$1,200	$5,800	$23,600
90th Percentile of Donations	$910	$0	$350	$750	$1,100	$2,900	$4,300	$18,800	$85,100
Panel B: Donating Households									
Mean Donation	$1,600	$680	$800	$1,000	$1,200	$2,700	$3,900	$16,200	$77,700
10th Percentile of Donations	$30	$20	$20	$20	$30	$50	$60	$170	$350
25th Percentile of Donations	$80	$50	$50	$60	$60	$120	$180	$620	$1,500
50th Percentile of Donations	$260	$170	$190	$200	$210	$410	$570	$2,200	$7,100
75th Percentile of Donations	$910	$600	$680	$710	$720	$1,300	$1,800	$7,000	$28,300
90th Percentile of Donations	$3,100	$1,600	$2,200	$2,700	$2,700	$4,400	$5,900	$21,800	$100,200

Note: All dollars reported in $2015 constant dollars; see text for description of sample

Table 2: Summary Statistics for Additional Variables

Mean Age	45
Mean Number of children per household	1.04
Mean Pre-Tax Income (2015$)	$87,100
Median Pre-Tax Income (2015$)	$67,800
Mean Capital Gain/Loss ($)	$2,400
Mean Total Dollars Claimed as Federal Tax Credits ($)	$25,000
Mean Federal Tax Credit Received ($)	$4,200
Mean Federal Charity Tax Credits Received ($)	$180
Share of Taxfilers Married	71.0%

Table 3 - Estimates of Tax Price Elasticity of Donations

Dependent Variable:	OLS	IV	IV	IV
Log Donations	(1)	(2)	(3)	(4)
Log Tax Price	**-9.26**	**-1.30**	**-1.04**	***-1.04***
	(0.40)	(0.56)	(0.36)	(0.57)
Age	0.01	0.02	0.03	0.03
	(0.00)	(0.00)	(0.00)	(0.00)
Age Squared	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Log Pre-Tax Income	**-0.09**	**0.25**	**0.26**	**0.26**
	(0.01)	(0.02)	(0.02)	(0.02)
Capital Gains/Losses	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)
Household Fixed Effects	Yes	No	Yes	Yes
Cluster for Standard Error	CSD	CSD	CSD	Prov
N (weighted)	227,062,725	227,062,725	227,062,725	227,062,725
R-Squared	0.71	0.72	0.71	0.71

All regressions include household fixed fffects, time trends, number of children in the household, and an indicator for marital status. Standard errors in parentheses. Coefficient in bold statistically significant p<0.05; Coefficient in italics statstically significant p<0.10.

Table 4 - Estimates of Tax Price Elasticity of Donations for Donors and Extensive Margin Effects

	Taxprice Elasticity: Donors	Extensive Margin
	(1)	(2)
Log Tax Price	**-0.76**	-0.04
	(0.12)	(0.05)
Age	0.03	0.00
	(0.00)	(0.00)
Age Squared	0.00	0.00
	(0.00)	(0.00)
Log Pre-Tax Income	**0.27**	0.05
	(0.01)	(0.00)
Capital Gains/Losses	0.00	0.00
	(0.00)	(0.00)
Fraction Donors		0.40
Implied Elasticity (Log Tax Price Coefficient/Fraction Donors)		-0.10
N (weighted)	90,846,130	227,062,725
R-Squared	0.79	0.60

All regressions include individual Fixed Effects, Time trends, number of children, indicator for marital status. Standard errors in parentheses. All standard errors estimated using CSD clusters

Table 5 - Elasticity Estimates by Pre-Tax Income Quantile

	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	Top 10%	Top 1%	Top 0.1%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: Tax Price Elasticity of Giving, Full Sample								
Log Tax Price	**-1.46**	-0.93	-0.34	-0.18	***-0.32***	**-0.60**	**-1.35**	-1.05
	(0.48)	(0.73)	(0.75)	(0.38)	(0.19)	(0.23)	(0.48)	(1.00)
Log Income	**0.03**	**1.07**	**0.85**	**0.99**	**0.63**	**0.52**	**0.32**	**0.24**
	(0.01)	(0.08)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.05)
N	45,412,765	45,412,380	45,412,505	45,412,535	45,412,540	22,706,295	2,270,635	227,065
R2	0.65	0.72	0.74	0.73	0.71	0.73	0.78	0.80
Panel B: Tax Price Elasticity of Giving, Donors (Intensive Margin)								
Log Tax Price	***0.58***	-0.36	***-0.58***	**-0.66**	**-0.58**	**-0.59**	**-0.61**	**-0.43**
	(0.32)	(0.29)	(0.35)	(0.28)	(0.13)	(0.11)	(0.13)	(0.17)
Log Income	**0.03**	**0.47**	**0.42**	**0.46**	**0.42**	**0.39**	**0.30**	**0.29**
	(0.00)	(0.01)	(0.02)	(0.01)	(0.01)	(0.02)	(0.02)	(0.05)
N	3,012,195	12,025,625	18,772,335	24,521,975	32,514,000	17,605,360	1,985,980	202,200
R2	0.87	0.86	0.86	0.84	0.80	0.81	0.82	0.00
Panel C: Extensive Margin Effect, Full Sample								
Log Tax Price	**-0.27**	-0.12	0.05	***0.14***	**0.07**	0.01	**-0.13**	-0.12
	(0.08)	(0.11)	(0.10)	(0.08)	(0.03)	(0.04)	(0.05)	(0.12)
Log Income	**0.01**	**0.19**	**0.15**	**0.16**	**0.05**	**0.03**	**0.01**	0.00
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Fraction Donors	0.07	0.26	0.41	0.54	0.72	0.78	0.87	0.89
Implied Elasticity (Coefficient/Fraction Donors)	-4.07	-0.45	0.12	0.26	0.10	0.01	-0.15	-0.13
N	45,412,765	45,412,380	45,412,505	45,412,535	45,412,540	22,706,295	2,270,635	227,065
R2	0.61	0.64	0.63	0.60	0.55	0.57	0.64	0.71

All regressions include household Fixed Effects, Time trends, number of children, indicator for marital status. Standard errors in parentheses. All standard errors estimated using CSD clusters. All specifications use an IV estimation.

Table 6 - Estimates of Tax Price Elasticity by Age Quintile

	1st Quintile (youngest)	2nd Quintile	3rd Quintile	4th Quintile	5th Quintile (oldest)
	(1)	(2)	(3)	(4)	(5)
Log Tax Price	**-2.94**	**-1.54**	**-1.07**	***-0.55***	0.05
	(0.57)	(0.50)	(0.43)	(0.33)	(0.28)
Age	**0.05**	**0.03**	0.03	0.02	0.00
	(0.01)	(0.01)	(0.00)	(0.00)	(0.01)
Age Squared	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Log Pre-Tax Income	**0.11**	**0.19**	**0.21**	**0.25**	**0.31**
	(0.03)	(0.02)	(0.02)	(0.01)	(0.01)
Capital Gains/Losses	0.00	0.00	0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
N (weighted)	50,562,225	40,585,610	45,714,315	50,254,540	39,946,040
R-Squared	0.69	0.76	0.78	0.79	0.80

All regressions include household Fixed Effects, Time trends, number of children, indicator for marital status. Standard errors in parentheses. All standard errors estimated using CSD clusters. All specifications use an IV estimation.

Table A1 - First Stage and Reduced Form for Preferred IV Specification

	First Stage	Reduced Form
	(1)	(2)
Low Credit Rate	**-0.82**	***0.71***
	(0.03)	(0.46)
High Credit Rate	**-0.48**	**0.53**
	(0.02)	(0.19)
Age	0.00	0.02
	(0.00)	(0.00)
Age Squared	0.00	0.00
	(0.00)	(0.00)
Income	-0.04	**0.30**
	(0.00)	(0.01)
Capital Gains	0.00	0.00
	(0.00)	(0.00)
N	227,062,725	227,062,725
R^2	0.71	0.69
F-Stat on Excluded Instruments	777	

All regressions include individual Fixed Effects, Time trends, number of children, indicator for marital status. Standard errors in parentheses. All standard errors estimated using CSD clusters in columns 1-3, column 4 estimates standard errors using provincial clusters

Table A2 - Estimates of Tax Price Elasticity with Instruments Individually

	Low Credit Rate Instrument	High Credit Rate Instrument
	(1)	(2)
Log Tax Price	-0.86	***-1.11***
	(0.87)	(0.75)
Age	**0.03**	**0.03**
	(0.00)	(0.00)
Age Squared	**0.00**	**0.00**
	(0.00)	(0.00)
Log Pre-Tax Income	**0.27**	**0.26**
	(0.04)	(0.03)
Capital Gains/Losses	**0.00**	**0.00**
	(0.00)	(0.00)
N (weighted)	227,055,690	227,055,690
R-Squared	0.71	0.71

All regressions include individual Fixed Effects, Time trends, number of children, indicator for marital status. Standard errors in parentheses. All standard errors estimated using CSD clusters in columns 1-3, column 4 estimates standard errors using provincial clusters

Table A3 - Estimates of Tax Price Elasticity Including Movers

	Tax Price Elasticity	Extensive Margin
	(1)	(2)
Log Tax Price	**-0.93**	-0.02
	(0.35)	(0.05)
Age	0.03	0.00
	(0.00)	(0.00)
Age Squared	0.00	0.00
	(0.00)	(0.00)
Log Pre-Tax Income	**0.27**	0.05
	(0.02)	(0.00)
Capital Gains/Losses	0.00	0.00
	(0.00)	(0.00)
N (weighted)	247,559,930	247,559,930
R-Squared	0.71	0.59

All regressions include individual Fixed Effects, Time trends, number of children, indicator for marital status. Standard errors in parentheses. All standard errors estimated using CSD clusters in columns 1-3, column 4 estimates standard errors using provincial clusters

Table A4 - Estimates of Taxprice Elasticity using Alternative Income Concepts

	1st Quintile	2nd Quintile	3rd Quintile	4th Quintile	5th Quintile	Top 10%	Top 1%	Top 0.1%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A: After Tax Income Quintiles								
Log Tax Price	**-1.38**	-0.96	-0.22	0.11	-0.44	**-0.74**	**-1.20**	**-1.16**
	(0.56)	(1.03)	(0.89)	(0.56)	(0.40)	(0.34)	(0.15)	(0.37)
N	42,197,680	42,022,600	42,351,420	43,106,700	44,020,240	21,617,100	2,053,800	189,330
R2	0.63	0.70	0.72	0.71	0.71	0.72	0.75	0.76
Panel B: Market Income Quintiles								
Log Tax Price	***-1.22***	-0.89	-0.32	-0.28	-0.31	**-0.74**	**-1.20**	**-1.16**
	(0.66)	(1.08)	(0.92)	(0.49)	(0.44)	(0.34)	(0.15)	(0.37)
N	42,334,280	42,146,650	42,439,290	43,192,890	44,123,420	21,617,100	2,053,800	189,330
R2	0.61	0.70	0.72	0.71	0.70	0.72	0.75	0.76
Panel C: Ever in Pre-Tax Income Quintile								
Log Tax Price	**-1.46**	-1.04	***-0.98***	***-0.77***	-0.60	-0.51	**-1.11**	***-0.68***
	(0.66)	(0.84)	(0.75)	(0.59)	(0.54)	(0.54)	(0.23)	(0.40)
N	96,859,900	123,922,330	131,804,200	122,333,380	89,112,540	53,106,680	7,139,850	982,440
R2	0.61	0.63	0.65	0.66	0.67	0.66	0.69	0.68

All regressions include individual Fixed Effects, Time trends, number of children, indicator for marital status. Standard errors in parentheses. All standard errors estimated using CSD clusters in columns 1-3, column 4 estimates standard errors using provincial clusters

Table A5 - Example of Donation Optimization Behaviour

	Poor				Rich			
	Yearly		Every 5 Years		Yearly		Every 5 Years	
year	Donation	Credit	Donation	Credit	Donation	Credit	Donation	Credit
1	200	47.58	0	0	10000	4947.58	0	0
2	200	47.58	0	0	10000	4947.58	0	0
3	200	47.58	0	0	10000	4947.58	0	0
4	200	47.58	0	0	10000	4947.58	0	0
5	200	47.58	1000	447.58	10000	4947.58	50000	24947.58
Total	1000	237.9	1000	447.58	50000	24737.9	50000	24947.58
Proportional Gain by Filing Every 5 years				88.14%				0.85%

Figure 1: Provincial and Federal Tax Credits

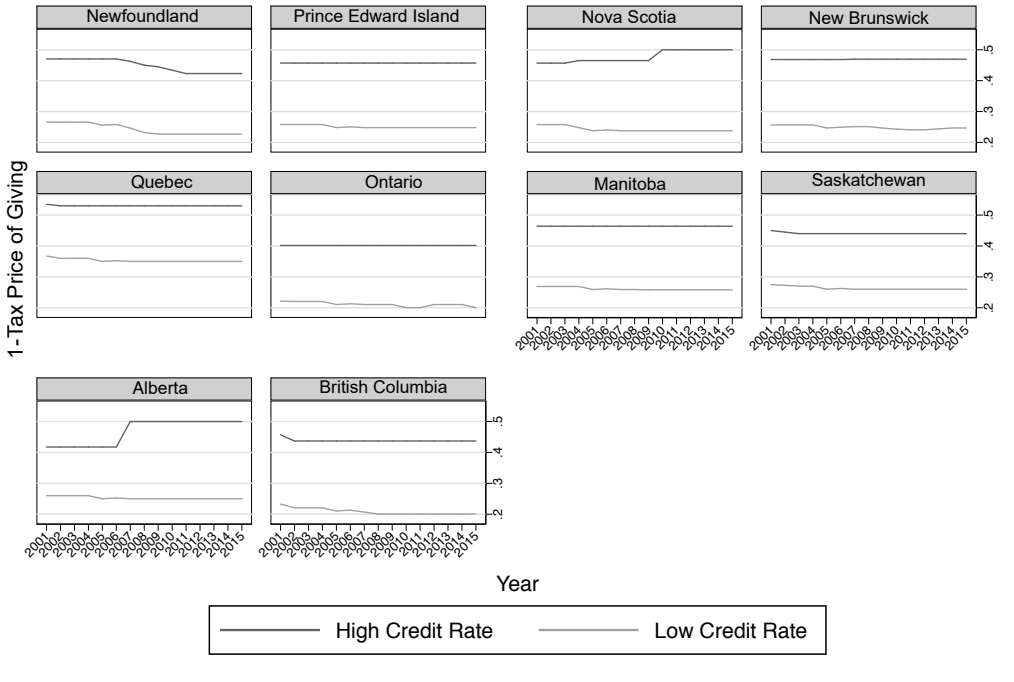

Figure 2: Donations and Tax Price

by Province and Year

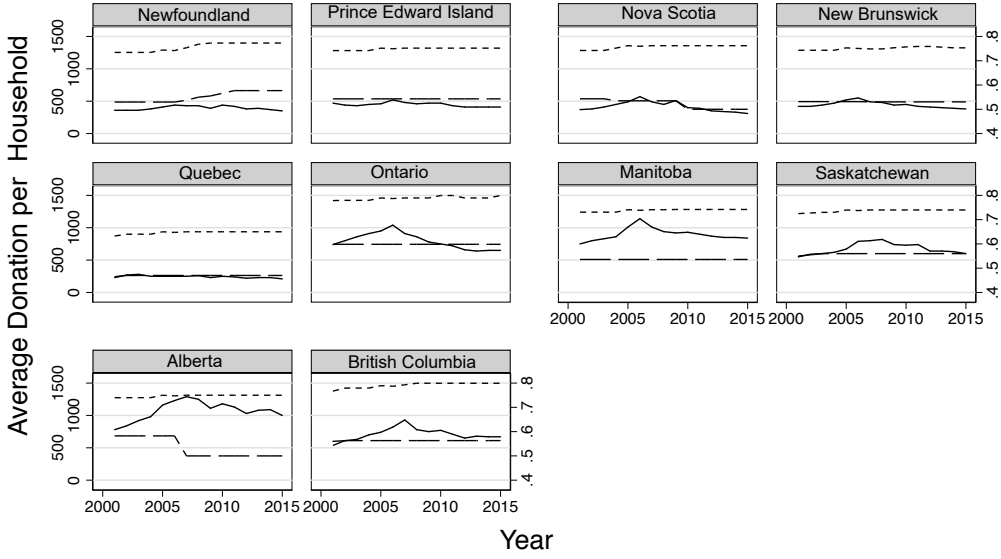

Figure 3: Share of Households Observed Donating

by Province and Year

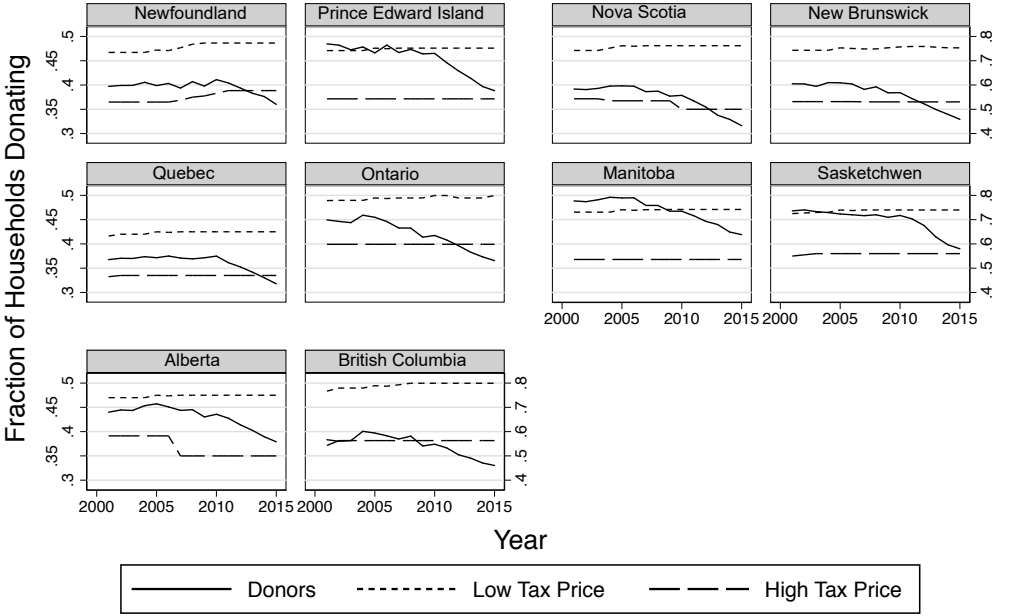

Figure 4: Tax Price Elasticity by Age Group