Estimating Effect of Tax Incentives on Charitable Giving Considering Self-Selection of Tax Relief in South Korea

Hiroki Kato [1] Tsuyoshi Goto [2] Yong-Rok Kim [3]

[1]Osaka University

[2]Chiba University

[3]Kansai University

2022/01/05

社会にとって寄付の税インセンティブを与えることは望ましいか？

- 多くの国の税制は、所得控除や税額控除を通して、寄付に金銭的インセンティブを設けている
  - 利点: 公共財の私的供給を促進する
  - 欠点: 税収を減らしてしまう
- 税収の減少分を十分に上回るだけの寄付を増やせれば、税インセンティブは社会的に望ましい
  - 厚生評価の重要なパラメータ: 寄付の（税）価格弾力性
  - この絶対値が 1 を超えれば、税インセンティブは社会的に望ましい (Saez, 2004)
- 韓国の税制改革を用いて、寄付の価格弾力性を推定することを目的とする

税インセンティブの自己選択の問題

税インセンティブと申告コストに基づいて、納税者は控除を受けるかどうかを意思決定する

- 申告コストが大きいことを指摘している研究がいくつかある
  - アメリカの個人所得税の確定申告: 申告準備（Record keeping）のコスト $>$ 申告自体（Tax filing）のコスト (Benzarti, 2020)
  - イギリスの寄付控除の固定費用: 申告された寄付額の 10% に相当 (Almunia et al., 2020)
  - デンマークの寄付控除でも、record keeping のコストを含めた様々な optimization friction がある (Gillitzer and Skov, 2018)
- 韓国においても、寄付控除を受けるためのコストは大きいと考えられる
  - 控除を受けた寄付者の割合は 42% (from our data)
  - 控除を受けた寄付者の平均寄付額は 174 万ウォンである一方、控除を受けていない寄付者の平均寄付額は 133 万ウォン (from our data)

本研究の概要 (1)

韓国における 2014 年の税制改革を用いて、税インセンティブの自己選択を考慮した寄付の価格弾力性を推定する

- 韓国のパネルデータ（National Survey of Tax and Benefit）を使用する
  - サーベイデータの利点 → 申告された寄付額は実際の寄付額と異なる測定誤差 (Fack and Landais, 2016; Gillitzer and Skov, 2018) を回避できる
- 2014 年の税制改革（所得控除 → 税額控除）を税インセンティブの外生変動として利用した DID で推定する
  - 所得税率に依存したインセンティブ（所得控除）から納税者に一律のインセンティブ（税額控除）に変更
- 申告コストの外生要因として、給与所得者かどうかを用いる
  - 給与所得者はそれ以外よりも申告コストが低いと予想される

本研究の概要 (2)

Result

1. Baseline results show that the giving price elasticity is less than -1.4 in terms of intensive margins and less than -1.7 in terms of extensive margins in Korea.
2. The estimated giving price elasticity for those who declare charitable giving is around -1.2 -1.6.
   - These estimates are more elastic than the estimates in the extant research, many of which show around -1.
3. By reducing application cost, we can increase charitable giving.
4. Given our estimates, increasing the subsidy on charitable giving will be desirable in Korea.

韓国の寄付控除制度

寄付控除のモデル

$$x_{it} + g_{it} = y_{it} - R_{it}T_t(y_{it}, g_{it}) - (1 - R_{it})T_t(y_{it}) \tag{1}$$

- x_{it} は私的消費財、g_{it} は寄付額
- y_{it} は課税前所得、R_{it} は寄付を申告するかどうかのダミー変数
- $T_t(y_{it})$ と $T_t(y_{it}, g_{it})$ は寄付申告をしなかったときの課税額と申告したときの課税額
- 寄付の税インセンティブは $s_{it} = \partial T_t(y_{it}, g_{it})/\partial g_{it}$ であり、寄付の相対価格は $1 - s_{it}$

(g_{it}, y_{it}) を所与として、寄付控除の節税額が申告コスト (K_{it}) を上回るとき、寄付控除を受ける

$$R_{it} = 1[T_t(y_{it}) - T_t(y_{it}, g_{it}) > K_{it}] \tag{2}$$

2014 年の税制改革: 所得控除から税額控除へ

所得控除 (income deduction)

$$T_t(y_{it}, g_{it}) = T_t(y_{it} - g_{it}) \tag{3}$$

- 税インセンティブは $s_{it} = T_t'(y_{it} - g_{it})$
- 高所得であるほど税負担が軽減される（限界税率が高い）ので、低所得より高所得の方が有利な制度

税額控除（tax credit）

$$T_t(y_{it}, g_{it}) = T_t(y_{it}) - mg_{it} \tag{4}$$

- m は税額控除率であり、$m = 0.15$
- 税インセンティブは $s_{it} = m$
- 2014 年の税制改革は税の逆進性を緩和し、税負担の公平性を改善することを目的として、所得に依存しない均一なインセンティブを導入した

韓国における寄付申告の手続き

韓国では所得税納税者は寄付に対して税制上の優遇を受けることができる

- 優遇を受けるためには、１年間の寄付の証明書を提出して寄付申告する必要がある
  - 給与所得者と非給与所得者で手続きが大きく異なる
- 給与所得者
  - 所得税を源泉徴収で納税し、寄付申告は会社で行う
  - 給与所得者は証明書の提出は随時行うことができる
  - 控除制度の正しい理解や書類作成の必要は特にない
- 非給与所得者
  - 所得納税を確定申告で行い、寄付申告は確定申告時に国税庁で行う
  - 確定申告は翌年の５月に実施
  - 確定申告時まで証明書を保存しておく必要がある $\rightarrow$ 寄付証明書の発行をめぐり、寄付団体に５月頃問い合わせが殺到
  - 確定申告時には寄付金控除を受けるための申請書類を作成する必要がある
- 給与所得者のほうが寄付の申告コスト $\left(K_{it}\right)$ が低いと考えられる

Data

National Survey of Tax and Benefit (NaSTaB)

- NaSTaB has been implemented by The Korea Institute of Taxation and Finance since 2008
- The NaSTaB is an annual panel data on households' tax burden and public benefits
- The unit of analysis is 5,634 households throughout the country
  - 5,634 family heads and family members with more than 15 years old and with income or economically active
- Our analysis uses the NaSTaB data from (i) 2013-2018 and (ii) excluding respondents under the age of 23.
  - using the NaSTaB data before 2012 captures the effects of other tax reform than the reform in 2014.
  - we exclude respondents whose age is under 23 because they are not likely to have income or assets.

Descriptive Statistics

Table 1: Descriptive Statistics

	N	Mean	Std.Dev.	Min	Median	Max
Income and giving price						
Annual taxable labor income (unit: 10,000KRW)	36189	1747.26	2696.77	0.00	0.00	50000.00
First giving relative price	36198	0.86	0.04	0.62	0.85	0.94
Charitable giving						
Annual chariatable giving (unit: 10,000KRW)	36199	35.64	153.20	0.00	0.00	10000.00
Dummary of donation > 0	36199	0.24	0.42	0.00	0.00	1.00
Dummy of declaration of a tax relief	36199	0.10	0.30	0.00	0.00	1.00
Individual Characteristics						
Age	36199	53.45	16.22	24.00	51.00	103.00
Female dummy	36199	0.43	0.50	0.00	0.00	1.00
University graduate	36198	0.42	0.49	0.00	0.00	1.00
High school graduate dummy	36198	0.31	0.46	0.00	0.00	1.00
Junior high school graduate dummy	36198	0.27	0.44	0.00	0.00	1.00
Wage earner dummy	27394	0.56	0.50	0.00	1.00	1.00
#.Tax accountant / population	36199	1.04	0.51	0.32	0.92	2.24

Right-Skewed Income Distribution and Price Variation for Identification

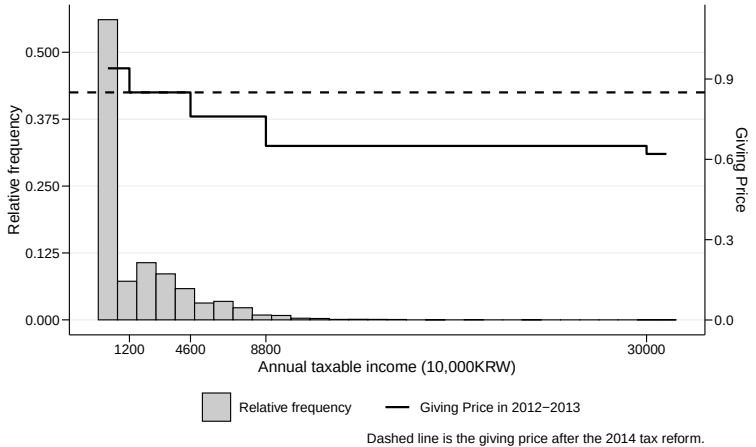

Figure 1: Income Distribution in 2013 and Relative Giving Price. Notes: The left and right axis measure the relative frequency of respondents (grey bars) and the relative giving price (solid step line and dashed line), respectively. A solid step line and a dashed horizontal line represents the giving price in 2013 and 2014, respectively.

Message from Figure 1

Right-skewed income distribution:

- NaSTaB contains the annual taxable labor income last year
- Our sample includes subjects with no labor income (e.g. housewives)
  - Table 1: the average income is 17.54 million KRW
- National Tax Statistical Yearbook 2012-2018 (Korean National Tax Service): the average annual taxable income is 32.77 million KRW
  - Sample: employees who submitted the tax return

Price variation for indetification

- Based on changes in tax incentive due to the 2014 tax reform, we can devide into three income groups:
  1. less than 120 million KRW: expanded tax incentive (decreased giving price)
  2. between 120 million KRW and 460 million KRW: unchanged tax incentive
  3. more than 460 million KRW: decreased tax incentive (increaed giving price)
- This is main source of identification for effect of tax incentive on giving.

Donors Decreased Immediately After Tax Reform

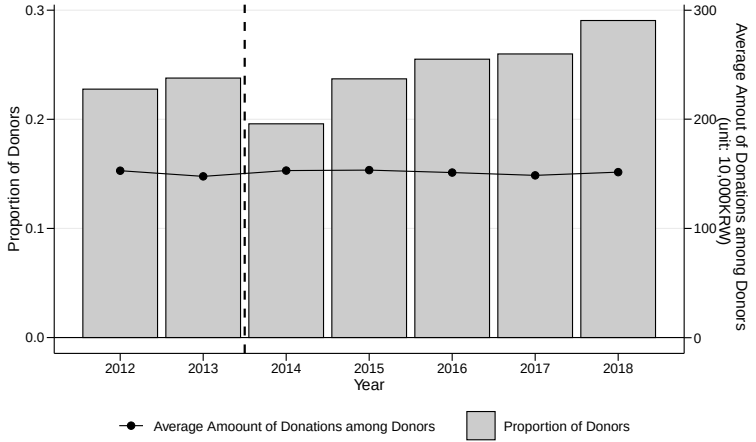

Figure 2: Proportion of Donors and Average Donations among Donors. Notes: The left and right axises measure prooortion of donors (grey bars) and the average amount of donations among donors (solid line), respectively.

Message from Figure 2

- Proportion of donors across years: 24% (Table 1)
- 2014: Proportion of donors is lower than before the tax reform
  - After that, proportion of donors has continued to increase, finally surpassing that before the tax reform

Notes:

- average donation conditional on donors has been stable across year
  - 1.5 million KRW (7% of average income)
  - Table 1: Unconditional average donation is 358,600 KRW (2% of average income)

Price Effect Can Be Observed

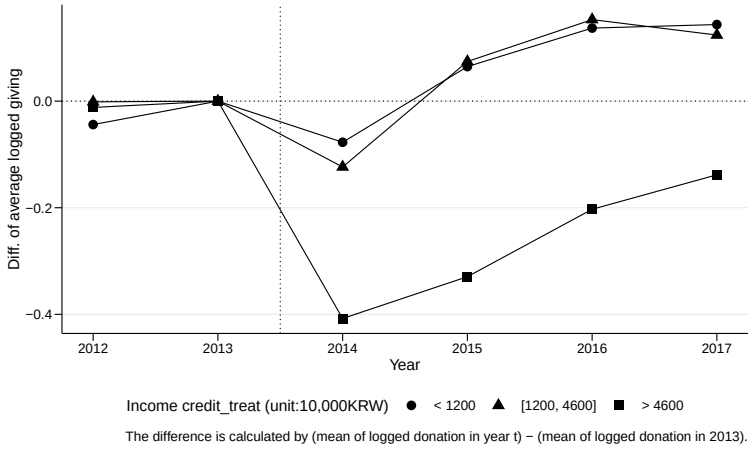

Figure 3: Average Logged Giving by Three Income Groups. Notes: We created three income groups, with the relative price of giving rising (circle), unchanged (triangle), and falling (square) between 2013 and 2014. The group averages are normalized to be zero in 2013.

Message from Figure 3

Price effect = Tax incentive increases charitable giving

- Donations for income groups with unchanged or increased tax incentives have exceeded those in 2013 since 2015
- Donations for income groups with reduced tax incentives have been lower than before tax reform since 2015

Other findings:

1. Prior to the 2014 tax reform, donations did not change in all groups
2. Donations for all groups were lower than in 2013
   - Donations for income groups with reduced tax incentive due to the 2014 tax reform was 40% of that in 2013
   - Announcement effect? Learning effect?

Price Effect Can Be Partially Observed for Intensive Margin

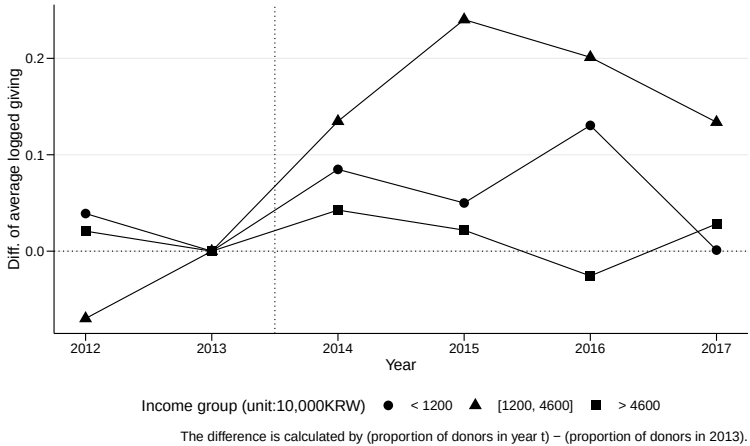

Figure 4: Average Logged Giving by Three Income Groups Conditional on Donors. Notes: We created three income groups, with the relative price of giving rising (circle), unchanged (triangle), and falling (square) between 2013 and 2014. The group averages are normalized to be zero in 2013.

Price Effect Can Be Observed for Extensive Margin

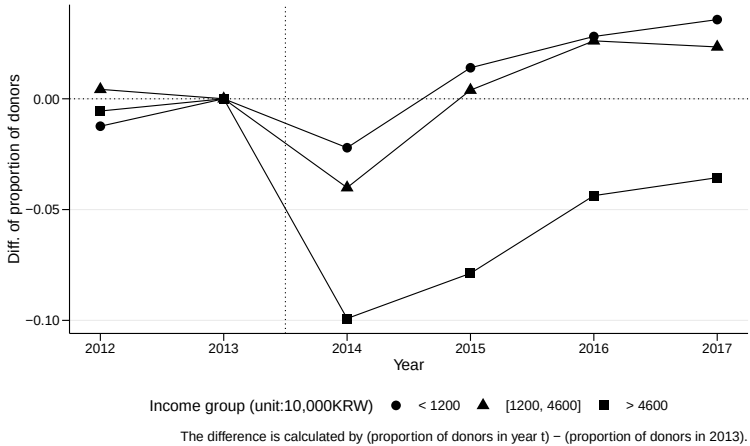

Figure 5: Proportion of Donors by Three Income Groups. Notes: We created three income groups, with the relative price of giving rising (circle), unchanged (triangle), and falling (square) between 2013 and 2014. The group averages are normalized to be zero in 2013.

Message from Figure 4 and 5

Intensive margin (How much donors give): Price effect can be partially observed

- The income group that increased the donation most was the group whose tax incentive did not change, but the donation of the income group that decreased the tax incentive did not change significantly.
- Income groups with unchanged tax incentives has increased donations more than income groups with expanded tax incentives (opposite to the price effect).

Extensive margin (Whethre respondents donate): Price effect can be observed

- Same trend as Figure 3

Application for Tax Relief Decreased After Tax Reform

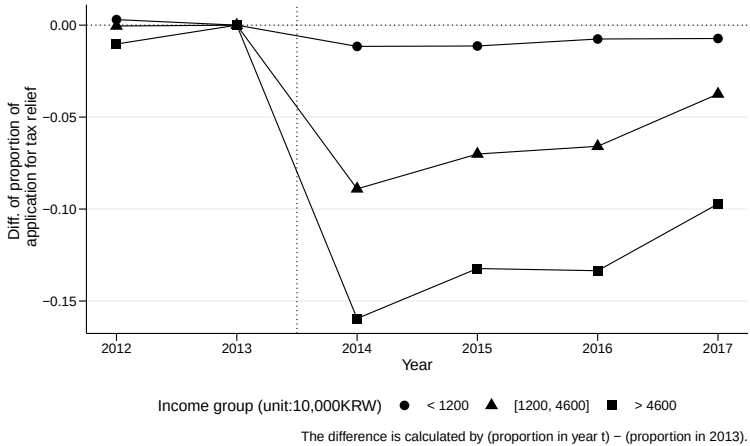

Figure 6: Proportion of Having Applied for Tax Relief by Three Income Groups. Notes: We created three income groups, with the relative price of giving rising (circle), unchanged (triangle), and falling (square) between 2013 and 2014. The group averages are normalized to be zero in 2013.

Message from Figure 6

1. tax incentive negatively correlated with application for tax relief.
   - Since the 2014 tax reform, the share of application for tax relief has not increased in all income groups compared to 2013.
   - the decrease in the application rate is the largest among income groups whose tax incentives decreased due to the 2014 tax reform.
2. the trend of application for tax relief does not match the trend of share of donors.
   - If there is no application cost, all donors should apply for tax relief
   - Figure 5 and 6 imply that there is cost to apply for tax relief.
   - The distribution of donations conditional on donors does not change significantly depending on whether or not they have applied for tax relief, suggesting that the application cost is high (Figure 8).

Wage Earners Are More Likely to Apply for Tax Relief

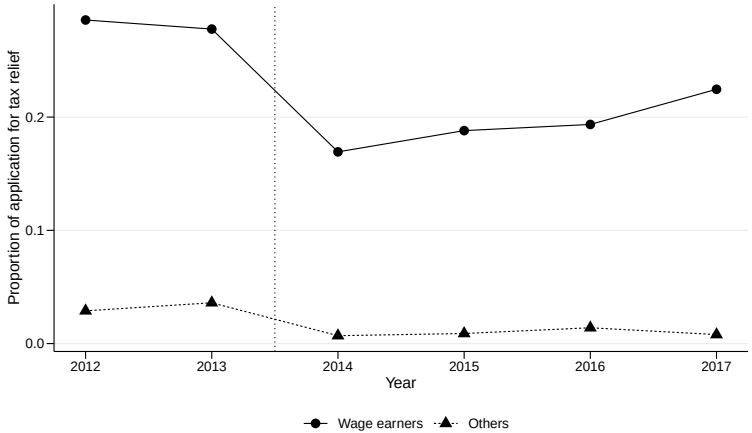

Figure 7: Share of Tax Relief by Wage Earners. Notes: A solid line is the share of applying for tax relief among wage eaners. A dashed line is the share of applying for tax relief other than wage earners.

Message from Figure 7

- Employment status is one dimension of variation of applied cost.
  - self-employed workers have to retain the certificate until they submit tax return.
  - wage earners can declare tax relief and submit the certificate through their company at any time.
- the proportion of declaring a tax relief among wage earners is higher than the others
  - Application cost for wage earners is lower than for other than wage earners
  - This trend does not change when we calculate the proportion of application conditional on donors (Figure 9).

Estimating Conventional Price Elasticities

Emprical Strategies

- We start to esimate the effect of tax incentive by estimating the price elasticity of charitable giving
- Following (**Almunia2020?**), we estimate two types of elasticities: the intensive-margin price elasticity and the extensive-margin price elasticity
  - The intensive-margin price elasticity: how much a 1% increase of price increases the amount of donations conditional on donors.
  - The extensive-margin price elasticity: how much the probability of donating increases with a 1% increase of price.

Estimation Equation for Intensive-Margin Elasticity

$$\ln g_{it} = \theta_i + \gamma \ln p_t(y_{it}, R_{it}, g_{it}) + \beta X_{it} + \lambda_t + u_{it}, \tag{5}$$

- X_{it} is a vector of covariate including income y_{it}
- θ_i is an individual fixed effect, and λ_t is a time fixed effect
- u_{it} is an idiosyncratic error
- Our prameter of interest is γ, which represents the intensive-margin price elasticity.

Estimation Equation for Extensive-Margin Elasticity

$$D_{it} = \theta_i + \delta \ln p_t(y_{it}, R_{it}, g_{it}) + \beta X_{it} + \lambda_t + u_{it}, \tag{6}$$

- D_{it} is a dummy taking one if positive giving is observed ($g_{it} > 0$).
- Our prameter of interest is δ
  - We cannot interpret the parameter δ as the extensive-margin price elasticity beucase the outcome is a dummy variable.
  - the extensive-maring price elasticity can be calculated as $\hat{\delta}/\bar{D}$ where $\bar{D}$ is sample mean of D_{it}.

Endogenous Giving Price

$$p_t(y_{it}, R_{it}, g_{it}) = \begin{cases} 1 - T_t'(y_{it} - R_{it} g_{it}) & \text{if} \quad t < 2014 \\ 1 - R_{it} m & \text{if} \quad t \geq 2014 \end{cases}, \tag{7}$$

- $T_t'(\cdot)$ is marginal tax rate in year t, and m is tax credit rate ($m = 0.15$).
- When tax deduction was applied, the function of price giving depends on charitable giving (g_{it}).
- Following past literatures estimating price elasticity of giving, we use the *first*-unit price of giving defined by $p_t(y_{it}, 1, 0)$ as an instrument for the *last*-unit price, $p_t(y_{it}, R_{it}, g_{it})$.

Estimation Results

Table 2: Estimation of Last-Unit Price Elasticities

	Overall		Intensive margin		Extensive margin	
	FE	FE-2SLS	FE	FE-2SLS	FE	FE-2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
log(last price)	-10.856***	-6.361***	-0.634***	-1.907***	-2.945***	-1.570***
	(0.300)	(0.579)	(0.231)	(0.451)	(0.071)	(0.127)
Implied price elasticity					-11.684***	-6.227***
					(0.281)	(0.502)
First-stage: log(first price)		0.353		0.726		0.353
		[407.8]		[442.4]		[407.8]
Num.Obs.	28696	28696	7234	7234	28696	28696
FE: area	X	X	X	X	X	X
FE: indust	X	X	X	X	X	X
FE: pid	X	X	X	X	X	X
FE: year	X	X	X	X	X	X
Square of age	X	X	X	X	X	X

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at individual level. A square bracket is wald statistics of instrument.

Message from Table 2

- Column 3 and 4: we estimate the equation (5), using the NaSTaB data consisting of donors only.
  - When we do not take endogenous nature of giving price into account, the intensive-margin price elasticity has upward-bias
  - The intensive-margin price elasticity is about -2% (column 4)
- Column 5 and 6 estimate the equation (6)
  - When we do not take endogenous nature of giving price into account, the extensive-margin price elasticity has downward-bias
  - The estimated coefficient of logged value of last-unit price is -1.5 (column 6).
  - The extensive-margin price elasticity is -5.8.

Robustness Analysis

1. Price elasticity excluding 2013 and 2014 data (Table 3)
   - to eliminate the effect of tax reform announcement.
   - estimated last-unit price elasticity is robust against the announcement effect of 2014 tax reform.
2. Price elasticity with a sample limited to those who applied for tax relief (Table 4)
   - the first-unit price elasticity is -1.2, and the last-unit price elasticity is -1.3
   - To directly control the dynamic effects, we add lagged and future changes of these variables
   - When controling this effect, the price elasticity is statistically insignificant.
3. Price elasticity to deal with endogenous nature of income (Table 5)
   - we estimate the k-th order difference model.
   - estimated intensive-margin price elasticity is between -1.8 and -4.1, which is statisically significant

Heterogenous Price Elasticity (1)

We estimate heterogeneity of the last-unit price elasticity in terms of individual characteristics (Table 6)

1. intensive-margin price elasticity for males is higher than for females, while the extensive-margin price elasticity for males is lower than for females
2. the higher the education level, the higher the intensive-margin price elasticity, but the lower the extensive-margin price elasticity
3. individuals in 40s are sensitive to tax incentives in both intensive-margin and extensive-margin.
4. wage earners are sensitive to tax incentive, while non wage earners are insenstive to tax incentive.

Heterogenous Price Elasticity (2)

We estimate the last-unit price elasticity for each organization to which the donation is made (Table 7)

1. charitable giving for social welfare organization and religious institution is sensitive to tax incentive in terms of both intensive margin and extensive margin
2. tax incentive negatively affects decision of donation for educational organization and political parties

Conclusion

Appendix

Distribution of Donations Conditional on Donors

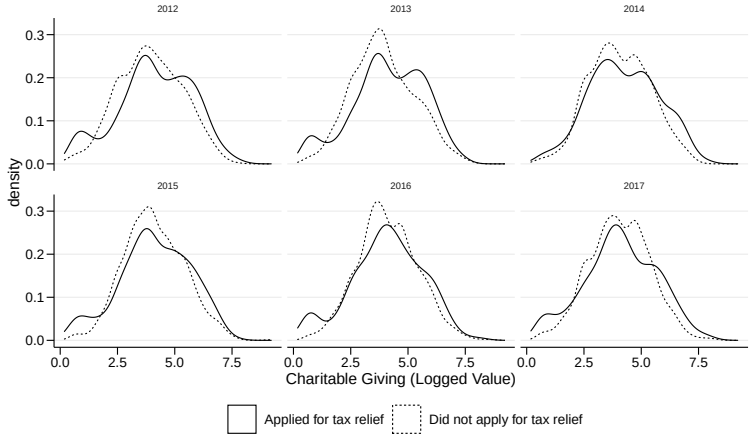

Figure 8: Distribution of Charitable Giving among Those Who Donated

Share of Application Conditional on Donors by Wage Earners

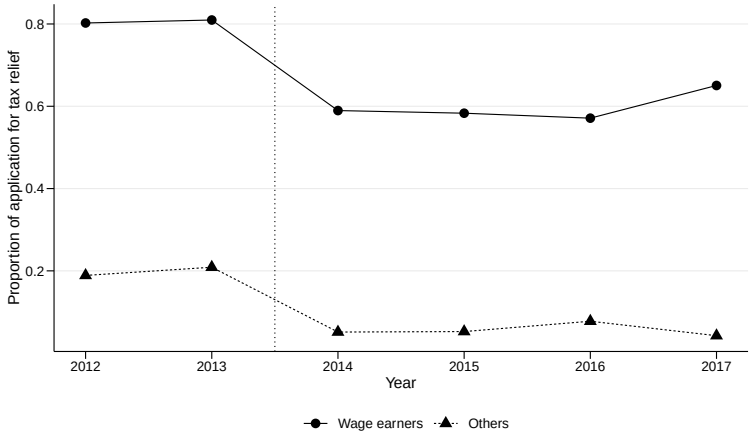

Figure 9: Share of Tax Relief by Wage Earners Conditional on Donors. Notes: A solid line is the share of applying for tax relief among wage eaners. A dashed line is the share of applying for tax relief other than wage earners.

Price Elasticity Excluding Announcement Effect

Table 3: Estimation of Last-Unit Price Elasticities Excluding 2013 and 2014 data

	Overall		Intensive margin		Extensive margin	
	FE	FE-2SLS	FE	FE-2SLS	FE	FE-2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
log(last price)	-11.309***	-6.331***	-0.679**	-2.088***	-3.097***	-1.560***
	(0.372)	(0.798)	(0.333)	(0.600)	(0.086)	(0.170)
Implied price elasticity					-11.574***	-5.830***
					(0.320)	(0.634)
First-stage: log(first price)		0.363		0.796		0.363
		[244.3]		[270.6]		[244.3]
Num.Obs.	20198	20198	5405	5405	20198	20198
FE: area	X	X	X	X	X	X
FE: indust	X	X	X	X	X	X
FE: pid	X	X	X	X	X	X
FE: year	X	X	X	X	X	X
Square of age	X	X	X	X	X	X

Notes: $^{*}\ p < 0.1$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$. Standard errors are clustered at individual level. A square bracket is wald statistics of instrument.

Subsample Analysis for Those Who Applied for Tax Relief

Table 4: Estimating Intensive-Margin Price Elasticities for Those Who Applied for Tax Relief

	(1)	(2)	(3)	(4)
log(first price)	-1.203***	-0.506		
	(0.390)	(0.847)		
log(last price)			-1.330***	-0.254
			(0.452)	(0.903)
log(income)	0.525	6.126	0.532	6.093
	(0.776)	(5.365)	(0.785)	(5.503)
1-year lag of price		0.369		0.487
		(0.884)		(0.911)
1-year lag of income		1.040		1.129
		(4.777)		(5.030)
1-year lead of income		-0.821		-0.826
		(0.907)		(0.904)
Instrument: log(first price)			0.942	-0.000
			[3083.6]	[0.0]
Num.Obs.	4079	1029	3972	1024
FE: area	X	X	X	X
FE: indust	X	X	X	X
FE: pid	X	X	X	X
FE: year	X	X	X	X
Square of age	X	X	X	X

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at individual level. 1-year lead of price cannot be estimated because of collinearity.

k-th Difference Model

Table 5: k-th Difference Model Using Those Who Applied for Tax Relief

	1-year lag	2-year lag	3-year lag
	(1)	(2)	(3)
Difference of logged first price	-1.890*	-2.530***	-4.057***
	(1.107)	(0.895)	(0.720)
First-stage: Instrument	0.995	0.991	0.984
	[34401.5]	[31041.1]	[17987.3]
Num.Obs.	4014	3903	3765
FE: area	X	X	X
FE: indust	X	X	X
FE: year	X	X	X
Difference of square age	X	X	X

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at individual level. Instrument is difference between lagged first price in year t and in year $t-k$ fixing income in year $t-k$.

Heterogenous Price Elasticity in terms of Covariates

Table 6: Heterogenous Last-Unit Price Elasticities in terms of Individual Characteristics

	Intensive margin			Extensive margin		
Covariate	Estimate	S.E.	N	Estimate	S.E.	N
Female	-0.551	(1.120)	2921	-9.786***	(1.440)	10674
Male	-1.919***	(0.523)	4313	-5.126***	(0.554)	18022
University graduate	-2.048***	(0.572)	4723	-4.494***	(0.488)	14778
High school graduate	-1.611	(1.066)	1977	-10.300***	(1.483)	9803
Less than junior high school graduate	1.012	(1.467)	534	-23.121***	(7.031)	4115
Age $<$ 40	-1.538	(1.459)	1889	-1.870	(2.211)	7800
40 $\leq$ Age $\leq$ 50	-2.293***	(0.781)	2823	-5.332***	(0.627)	9530
50 $<$ Age	-0.714	(0.718)	2522	-8.170***	(1.214)	11366
Wage earner	-1.966***	(0.486)	5517	-2.009***	(0.451)	15596
Non wage earner	-11.226	(11.177)	1690	-21.142	(33.822)	12934

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at individual level.

Heterogenous Price Elasticity in terms of Organization Type

Table 7: Estimating Last-Unit Price Elasticities for Each Oraganization Type

	Intensive margin			Extensive margin		
Type	Estimate	S.E.	N	Estimate	S.E.	N
Social welfare	-1.814**	(0.867)	2990	-5.514***	(1.394)	28696
Education	1.805	(4.507)	178	14.633*	(7.644)	28696
Political party	17.955	(47.747)	258	20.448***	(7.071)	28696
Religious institution	-1.300**	(0.619)	3867	-4.436***	(1.040)	28696
Relief activities by religious institution	-4.985	(3.092)	532	-2.378	(4.125)	28696
Others	-3.847	(3.780)	422	2.706	(4.644)	28696
Culture				15.386	(10.951)	28696

Notes: $^{*}\ p < 0.1$, $^{**}\ p < 0.05$, $^{***}\ p < 0.01$. Standard errors are clustered at individual level. We cannot the intensive-margin price elasticity for donations for culture due to small sample.

References

References

Almunia, M., Guceri, I., Lockwood, B., Scharf, K., 2020. More giving or more givers? The effects of tax incentives on charitable donations in the UK. Journal of Public Economics 183, 104114. doi:10.1016/j.jpubeco.2019.104114

Benzarti, Y., 2020. How Taxing Is Tax Filing? Using Revealed Preferences to Estimate Compliance Costs. American Economic Journal: Economic Policy 12, 38–57. doi:10.1257/pol.20180664

Fack, G., Landais, C., 2016. The effect of tax enforcement on tax elasticities: Evidence from charitable contributions in France. Journal of Public Economics 133, 23–40. doi:10.1016/j.jpubeco.2015.10.004

Gillitzer, C., 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, 892–916. doi:10.1093/oep/gpx055

Saez, E., 2004. The optimal treatment of tax expenditures. Journal of Public Economics 88, 2657–2684. doi:10.1016/j.jpubeco.2003.09.004