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

2021/12/18

Introduction

- In many countries, tax relief for charitable giving are implemented.
- The elasticity of giving tax relief is known as a key parameter to evaluate the welfare implication (Saez, 2004).
  - Intuitively, if the elasticity is more than 1 in absolute value, \$1 of tax relief make more than \$1 of charitable giving.
- Many papers investigate the elasticity based on tax return data (Almunia et al., 2020; Auten et al., 2002).

Introduction

- However, the tax return data record only the declared charitable giving.
  - First issue: **Actual donations is different from declared donations.** (Fack and Landais, 2016; Gillitzer and Skov, 2018)
  - We use panel survey data in South Korea to deal with this issue.
- Tax payers decide the amount of donation and whether to declare tax relief based on the size of tax incentive and declaration cost.
  - Second issue: Neglect of this declaration cost may bias the estimations of elasticity.
  - We use instrumental variable (IV) and control function approach for this issue.
- Based on DID as an identification strategy, we investigate the giving price elasticity of South Korea.

Introduction

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.

Conceptual Framework

Optimization Problem

Following Almunia et al. (2020), consider allocation problem between private consumption (x_{it}) and charitable giving (g_{it})

$$\max_{x_{it},g_{it},R_{it}} U(x_{it}, g_{it}, G_t) = u_i(x_{it}, g_{it}, G_t) - R_{it}K(Z_{it}), \tag{1}$$

$$\text{s.t. } x_{it} + g_{it} = y_{it} - R_{it}T_{it}(y_{it}, g_{it}) - (1 - R_{it})T_{it}(y_{it}), \tag{2}$$

$$G_t = g_{it} + G_{-it}, \tag{3}$$

where y_{it} is pre-tax total income, R_{it} is a dummy of declaration of tax relief and $T_{it}(y_{it})$ and $T_{it}(y_{it}, g_{it})$ are respectively the amount of tax when i does not declare tax relief and when i declares tax relief in year t. G_{-it} is public goods supplied by others. $K(Z_{it})$ is application cost which is a function of instrument Z_{it}.

Remarks on Optimization Problem

We assume

- No saving
- G_{-it} is large enough to $\frac{\partial u_i}{\partial G}(x, g, G) \approx 0$

Given R_{it}, optimal level of donations sloves

$$\max_{g_{it}} u_i(y_{it} - R_{it}T_{it}(y_{it}, g_{it}) - (1 - R_{it})T_{it}(y_{it}) - g_{it}, g_{it}, g_{it} + G_{-it}). \tag{4}$$

- We can ignore application cost $K(Z_{it})$ when solving optimal giving level because the application cost does not depend on g_{it}

First-Order Condition

$$-\frac{\partial u_i}{\partial x_{it}}\left(R_{it}\frac{\partial T_{it}}{\partial g_{it}}(y_{it}, g_{it}) + 1\right) + \frac{\partial u_i}{\partial g_{it}} = 0 \tag{5}$$

- $\partial T_{it}/\partial g_{it} < 0$ is tax incentive of charitable giving.
  - Let $s_{it} \equiv |\partial T_{it}/\partial g_{it}|$ be size of tax incentive.
  - Relative giving price is $1 - s_{it}$
  - As we explain later, there is *within* variation of s_{it} due to tax reform.

Define $g_i(1 - s_{it}, y_{it})$ and $g_i(1, y_{it})$ to be the optimal levels of donations (potential outcomes) for choices $R_{it} = 1, 0$ respectively.

Self-Selection of Tax Relief

We can write indirect utility as

$$v_i(1 - s_{it}, y_{it}, G_{-it}) - K(Z_{it}), \tag{6}$$
$$v_i(1, y_{it}, G_{-it}). \tag{7}$$

Thus, individual i applies for tax relief in year t, that is, $R_{it} = 1$ iff

$$\Delta v_{it} \equiv v_i(1 - s_{it}, y_{it}, G_{-it}) - v_i(1, y_{it}, G_{-it}) \geq K(Z_{it}). \tag{8}$$

Institutional Background in South Korea

2014 Tax Reform

Since 2014, tax relief of charitable giving has changed from **income deduction (**所得控除**)** to **tax credit (**税額控除**)**.

- Income deductions are more advantageous for high-income groups than low-income groups because the higher the income, the greater the decrease in tax burden.
- The 2014 tax reform aimed to alleviate the regressiveness of taxes and improve the equilibrium of taxation by changing from income deductions to tax credits.
- We exploit this reform as a main source of variation for identification
  - Difference-in-Difference

2014 Tax Reform

Tax deduction system (until 2013)

$$T_{it}(y_{it}, g_{it}) = T_{it}(y_{it} - g_{it}) \tag{9}$$

- Tax incentive is $s_{it} = T'(y_{it} - g_{it})$
- In 2012 and 2013, the marginal tax rate was the same, though it was different from ones before 2011.
- The giving price depended on income level (y_{it}) and giving level (g_{it})

Tax credit system (from 2014)

$$T_{it}(y_{it}, g_{it}) = T_{it}(y_{it}) - mg_{it} \tag{10}$$

- m is tax credit rate and is $m = 0.15$
- Tax incentive is $s_{it} = m$

Data

Data

We use the Korean annual financial panel survey, called the National Survey of Tax and Benefit (hereafter, NaSTaB).

- The subjects of this survey are general households and household members living in 15 cities and provinces nationwide.
- This survey is based on a face-to-face interview.
- Data is constructed as the subjects represent the population of Korean society.
- We exclude the subject of the sample, whose age is under 23, since they are not likely to have income or assets.
- We use data from 2013 to 2017 to focus the 2014 tax reform.

Descriptive Statistics

Table 1: Descriptive Statistics

	N	Mean	Std.Dev.	Min	Median	Max
Charitable Donations						
Annual chariatable giving (unit: 10,000KRW)	36259	35.86	153.36	0.00	0.00	10000.00
Dummary of donation > 0	36259	0.24	0.43	0.00	0.00	1.00
Income, giving price, and tax report						
Annual taxable labor income (unit: 10,000KRW)	36249	1754.32	2702.16	0.00	0.00	50000.00
First giving relative price	36258	0.86	0.04	0.62	0.85	0.94
Dummy of declaration of a tax relief	36259	0.10	0.30	0.00	0.00	1.00
Individual Characteristics						
Age	36259	53.43	16.21	24.00	51.00	103.00
Female dummy	36259	0.43	0.50	0.00	0.00	1.00
University graduate	36258	0.42	0.49	0.00	0.00	1.00
High school graduate dummy	36258	0.31	0.46	0.00	0.00	1.00
Junior high school graduate dummy	36258	0.27	0.44	0.00	0.00	1.00
Wage earner dummy	27453	0.56	0.50	0.00	1.00	1.00
#.Tax accountant / population	36259	1.04	0.51	0.32	0.92	2.24

Income Distribution and Giving Price

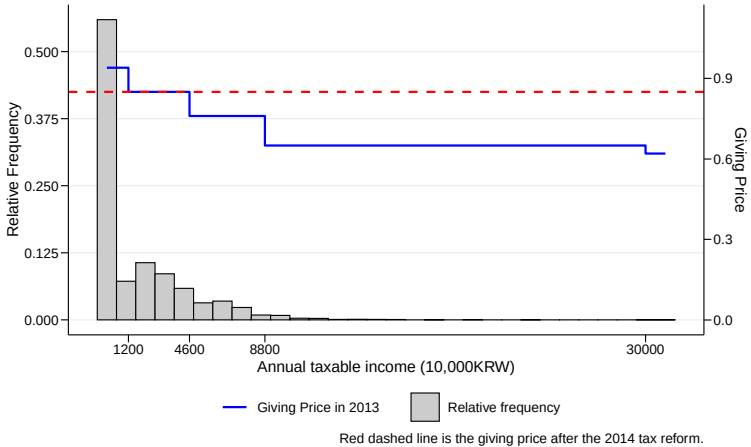

Figure 1: Income Distribution and Relative Giving Price in 2013. Notes: The left and right axis measure the relative frequency of respondents and the relative giving price, respectively. A blue step line and a red dashed horizontal line represents the giving price in 2013 and 2014, respectively. The grey bar shows income distribution in 2013.

Remarks on Figure 1

The 2014 tax reform

- has decreased the relative price of giving for those whose income is less than 12 million KRW (treatment)
- has unchanged the relative price of giving for those whose income is between 12 million KRW and 46 million KRW (control)
- has increased the relative price of giving for those whose income is more than 46 million KRW (treatment)

We exploit this within variation due to exogenous tax reform for identification.

Charitable Giving By Income Groups

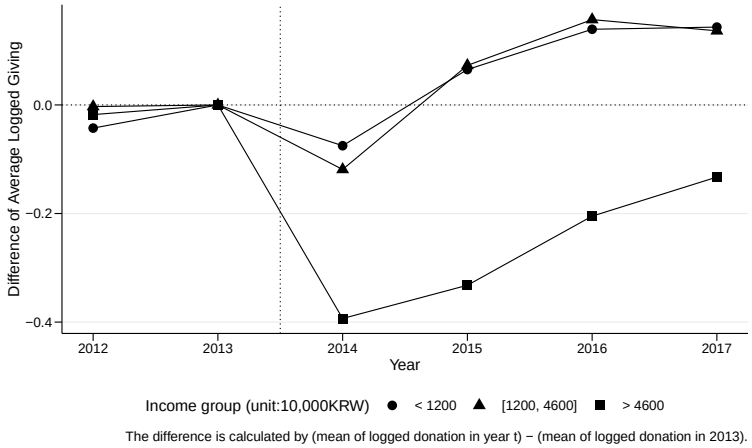

Figure 2: Average Logged Giving by Three Income Groups. Notes: We created three income groups, with the relative price of giving rising (circle), unchanged (triangle), and falling (square) between 2013 and 2014. The grup means are normalized to be one in 2013.

Charitable Giving by Income Group Conditional On Donors

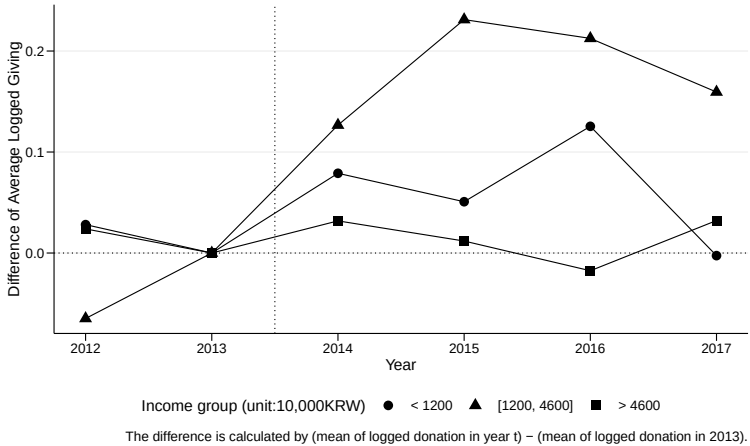

Figure 3: Average Logged Giving by Three Income Groups Conditional on Donors. Notes: We created three income groups, with the relative price of giving rising (circle), unchanged (triangle), and falling (square) between 2013 and 2014. The grup means are normalized to be one in 2013.

Propotion of Donors by Income Groups (Extensive Margin)

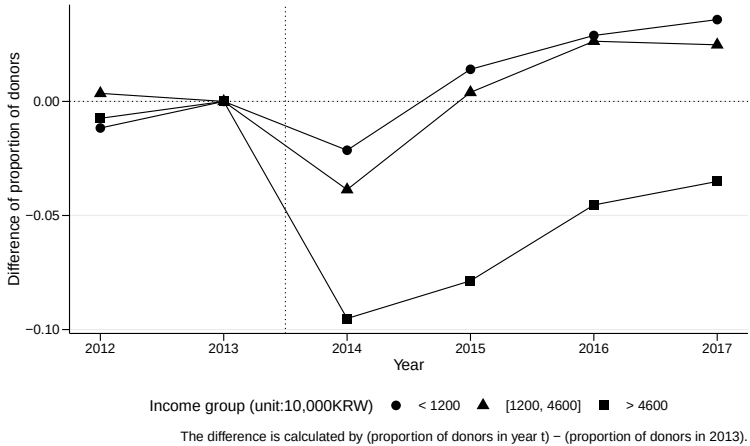

Figure 4: Proportion of Donors bn Three Income Groups. Notes: We created three income groups, with the relative price of giving rising (circle), unchanged (triangle), and falling (square) between 2013 and 2014. The grup means are normalized to be one in 2013.

Distribution of Charitable Giving

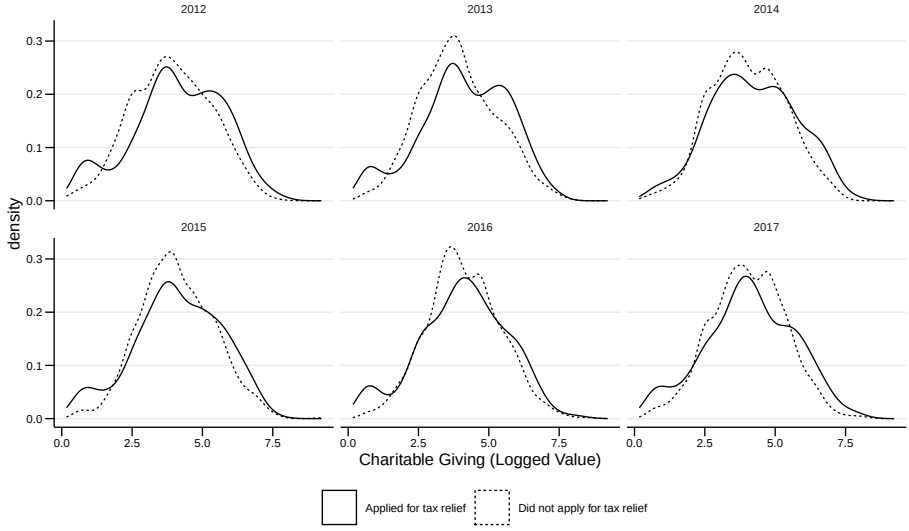

Figure 5: Distribution of Charitable Giving among Those Who Donated

Proportion of Donors By Having Applied for Tax Relief

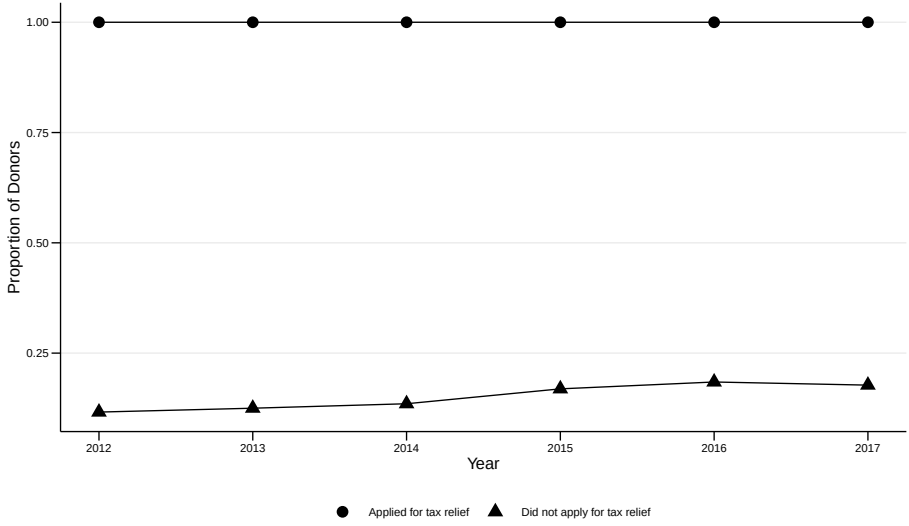

Figure 6: Proportion of Donors By Having Applied for Tax Relief

Share of Tax Relief Grouped by Wage Earner or not

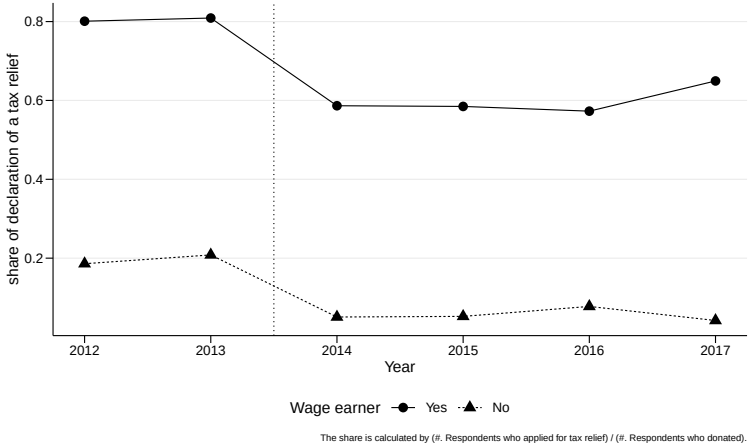

Figure 7: Share of Tax Relief. Notes: A solid line is the share of applying for tax relief among wage eaners. A dashed line is the share of applying for tax relief other than wage earners.

Share of Tax Relief Grouped By Three Income Group

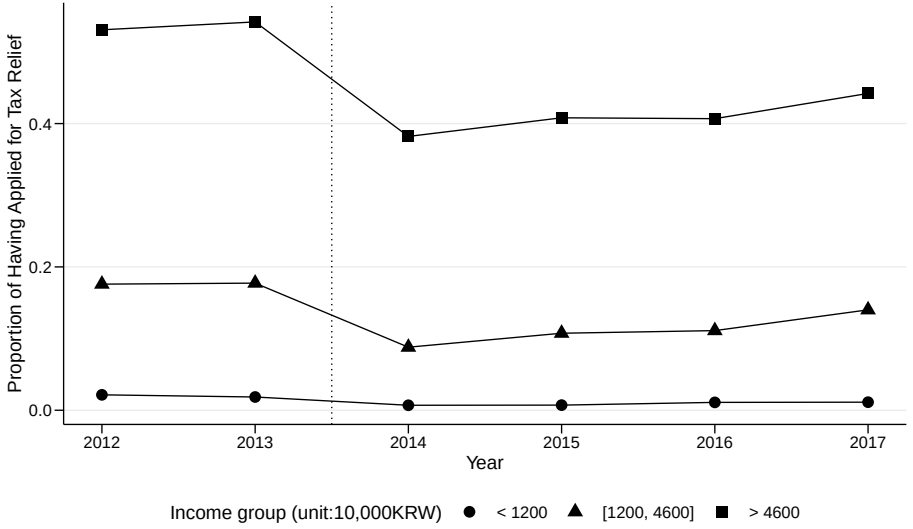

Figure 8: Proportion of Having Applied for Tax Relief in Three Income Groups. Notes: We created three income groups, with the relative price of giving rising (circle), unchanged

First-Stage Result: Who Applied for Tax Relief?

Estimating Conventional Price Elasticities

Control Function Approach

Welfare Implication

Conclusion

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. doi:10.1016/j.jpubeco.2019.104114

Auten, G.E., Sieg, H., Clotfelter, C.T., 2002. Charitable giving, income, and taxes: An analysis of panel data. American Economic Review 92, 371–382.

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:https://doi.org/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