

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

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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})

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

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

$$G_t = g_{it} + G_{-it}, \quad (3)$$

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 solves

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

- 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

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

- $\partial T_{it} / \partial g_{it} < 0$ 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

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

$$v_i(1, y_{it}, G_{-it}). \quad (7)$$

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

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

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)

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

- 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)

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

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

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)	36249	1754.32	2702.16	0.00	0.00	50000.00
Relative first price of giving	36258	0.86	0.04	0.62	0.85	0.94
Charitable giving						
Annual charitable giving (unit: 10,000KRW)	36259	35.86	153.36	0.00	0.00	10000.00
Dummy of donation > 0	36259	0.24	0.43	0.00	0.00	1.00
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

Right-Skewed Income Distribution and Price Variation for Identification

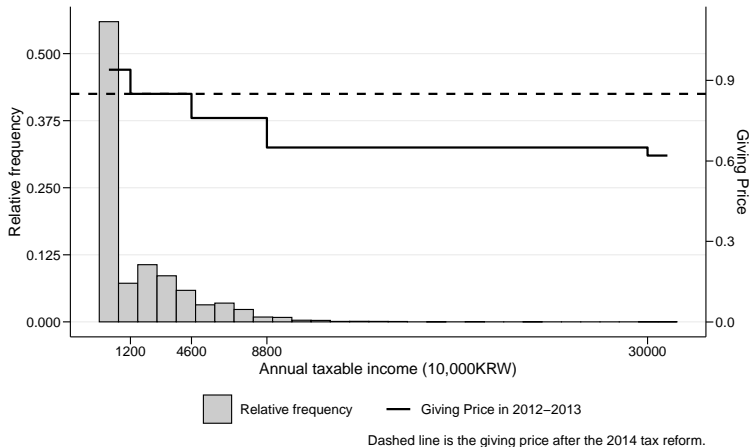


Figure 1: Income Distribution in 2013 and Relative Giving Price. Notes: The left and right axis measure the relative frequency of respondents (grey bars) and the relative giving price (solid step line and dashed line), respectively. A solid step line and a dashed horizontal line represents the giving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

Message from Figure 1: Right-Skewed 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

Message from Figure 1: Price Variation

Based on changes in tax incentive due to the 2014 tax reform, we can divide into three income groups:

1. less than 120 million KRW
 - 2014 tax reform has expanded tax incentive (decreased giving price)
2. between 120 million KRW and 460 million KRW
 - 2014 tax reform has unchanged tax incentive
3. more than 460 million KRW.
 - 2014 tax reform has decreased tax incentive (increased giving price)

This is main source of identification for effect of tax incentive on giving.

Donors Decreased Immediately After Tax Reform

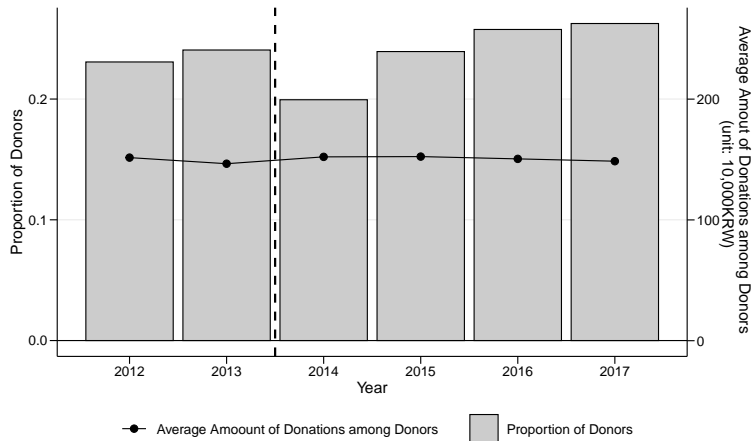


Figure 2: Proportion of Donors and Average Donations among Donors. Notes: The left and right axes measure proportion of donors (grey bars) and the average amount of donations among donors (solid line), respectively.

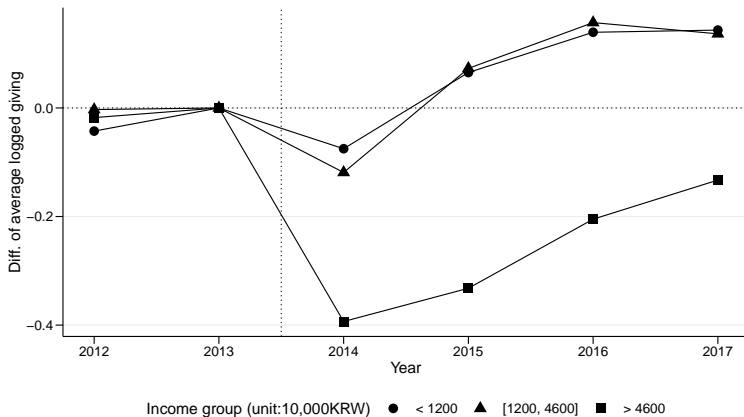
Message from Figure 2

- 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



The difference is calculated by (mean of logged donation in year t) – (mean of logged donation in 2013).

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

Notes:

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 (瀧井先生のコメント)?

Price Effect Can Be Partially Observed for Intensive Margin

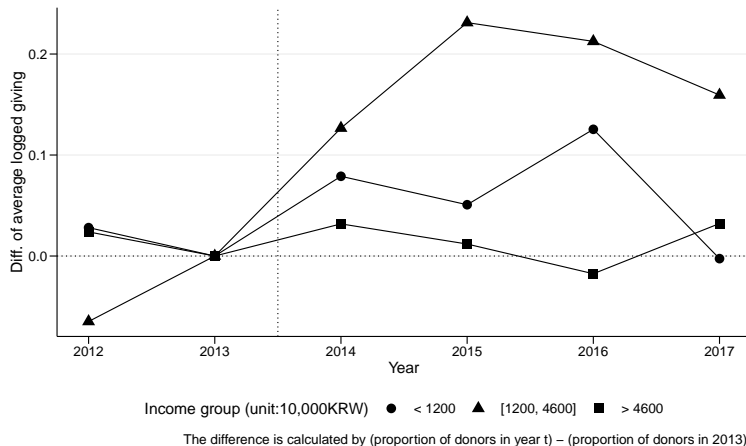


Figure 4: Average Logged Giving by Three Income Groups Conditional on Donors. Notes: We created three income groups, with the relative price of giving rising (circle), unchanged (triangle), and falling (square) between 2013 and 2014. The group averages are normalized to be zero in 2013.

Price Effect Can Be Observed for Extensive Margin

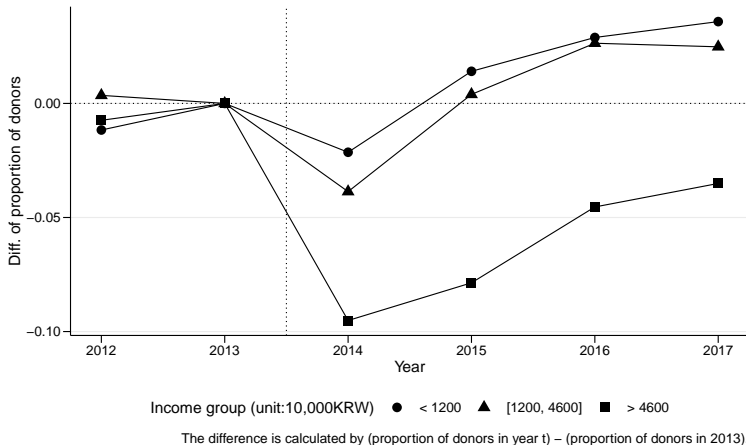


Figure 5: Proportion of Donors by Three Income Groups. Notes: We created three income groups, with the relative price of giving rising (circle), unchanged (triangle), and falling (square) between 2013 and 2014. The group averages are normalized to be zero in 2013.

Message from Figure 4 and 5

- Intensive margin (How much donors give): Price effect can be partially observed
 - tax incentive が変化しない所得層が寄付を最も増やしていたが、tax incentive が減少した所得層はあまり寄付を増やさなかった
 - tax incentive が変化しない所得層の方が tax incentive が拡充された所得層よりも寄付を増やしていた (price effect ではない)
- Extensive margin (Whether respondents donate): Price effect can be observed
 - 全体の寄付の増加率のグラフ (Figure 3) と同じ傾向

Application for Tax Relief Decreased After Tax Reform

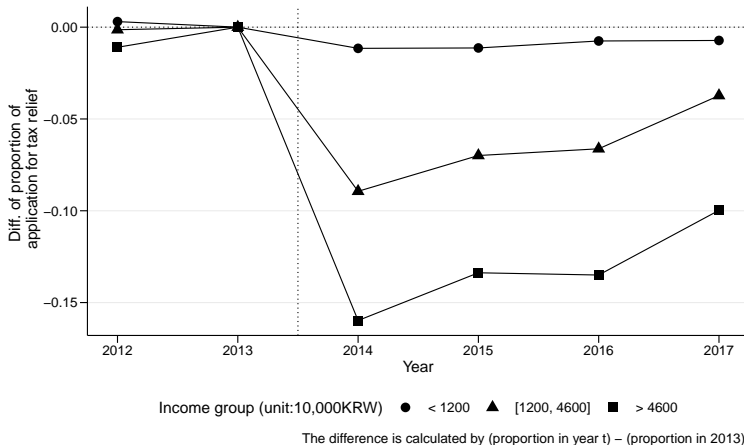


Figure 6: Proportion of Having Applied for Tax Relief by Three Income Groups. Notes: We created three income groups, with the relative price of giving rising (circle), unchanged (triangle), and falling (square) between 2013 and 2014.

Message from Figure 6

1. 2014 年税制改革以降、寄付控除を申請した人の割合は減少した
 - 全体を通じた寄付控除の申請比率：10% (Table 1)
 - tax incentive が減少した所得層の寄付控除の申請比率が減少した
2. tax incentive が増加した所得層の寄付者の割合が増えたにも関わらず、寄付控除の申請比率は伸びていない
 - 寄付控除を申告することで得するはずなのに、それをしていない人がいる → 申請コストが存在する

Similar Distribution of Giving Regardless of Application

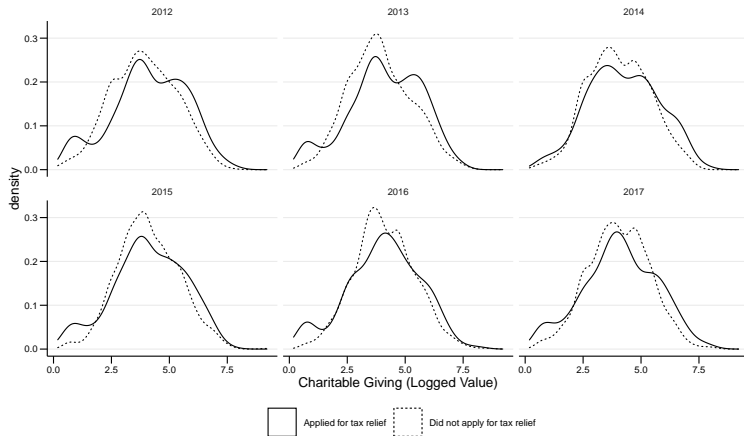


Figure 7: Distribution of Charitable Giving among Those Who Donated

Message from Figure 7

- すべての年においても、寄付者に限定した寄付の分布は寄付控除の申請の有無に依存しない
 - 寄付控除を申請していない人の寄付額の分布が申請している人よりも左側にあるならば、申請コストの程度は小さいと予想される
 - 分布の形状がほとんど一致しているので、申請コストの程度はかなり大きいと予想される

Wage Earners Are More Likely to Apply (1)

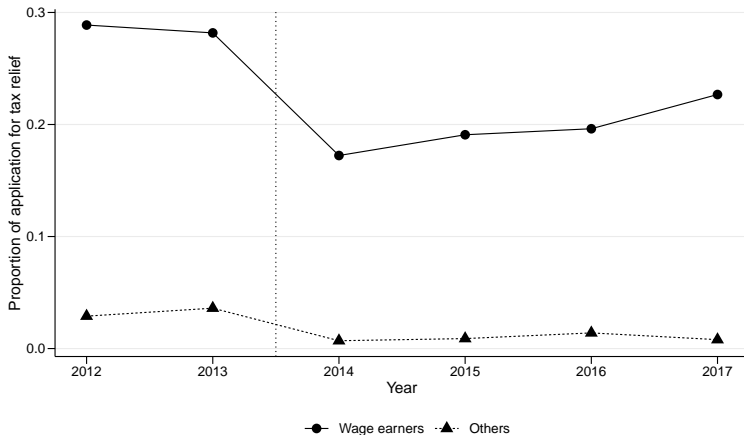


Figure 8: Share of Tax Relief by Wage Earners. Notes: A solid line is the share of applying for tax relief among wage earners. A dashed line is the share of applying for tax relief other than wage earners.

Wage Earners Are More Likely to Apply (2)

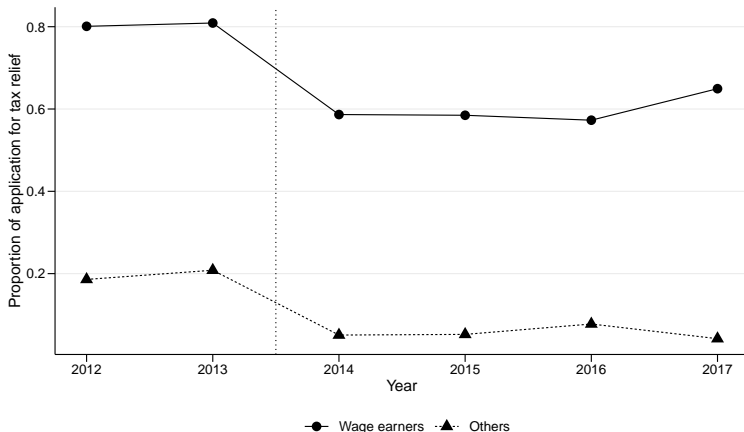


Figure 9: Share of Tax Relief by Wage Earners Conditional on Donors. Notes: A solid line is the share of applying for tax relief among wage earners. A dashed line is the share of applying for tax relief other than wage earners.

Message from Figure 8 and 9

- 給与所得者はそうでない人よりも寄付控除を申請しやすい
 - 自営業者（非給与所得者の主）は寄付の証明書を常に保管しているようなことはない（申請期限前に問い合わせが殺到する）
 - 給与所得者の方が申請しやすい環境にあることがデータからもわかる
 - 給与所得者かどうかで寄付者の比率が異なる可能性を考慮して、寄付者に限定しても同じ傾向である (Figure 9)
- 2014 年税制改革以降、寄付控除の申請比率は減少している（とくに、給与所得者）

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