

# Charitable Giving, Tax Reform, and Political Trust

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# Introduction

# Background of South Korea Tax Reform

To investigate the price effect, we use the 2014 tax reform in the South Korea.

- ▶ Before 2014, tax deduction was adopted to subsidize charitable donation behavior.
- ▶ After 2014, tax credit have been adopted.

The main difference is that tax credits reduce taxes directly, while tax deductions indirectly lower the tax burden by decreasing the taxpayer's marginal tax rate, which increases with gross income

Data

# National Survey of Tax and Benefit (NaSTaB)

- ▶ The Korea Institute of Taxation and Finance implements the financial panel survey to study the tax burden of households and the benefits that households receive from government.
- ▶ The subjects of this survey are general household and household members living in 15 cities and provinces nationwide.
- ▶ This survey is based on a face-to-face interview. If it is difficult for investigators to meet subjects, another family member answers on behalf of him.
- ▶ Survey items: Annual taxable income (last year), charitable donations (last year), trust for politicians (5-Likert scale), and other covariates (age, education, gender etc.).
- ▶ Survey period: 2008 ~ 2019
  - ▶ We use survey data after 2013 to focus on tax policy change in 2014.

# Time Series of Charitable Giving

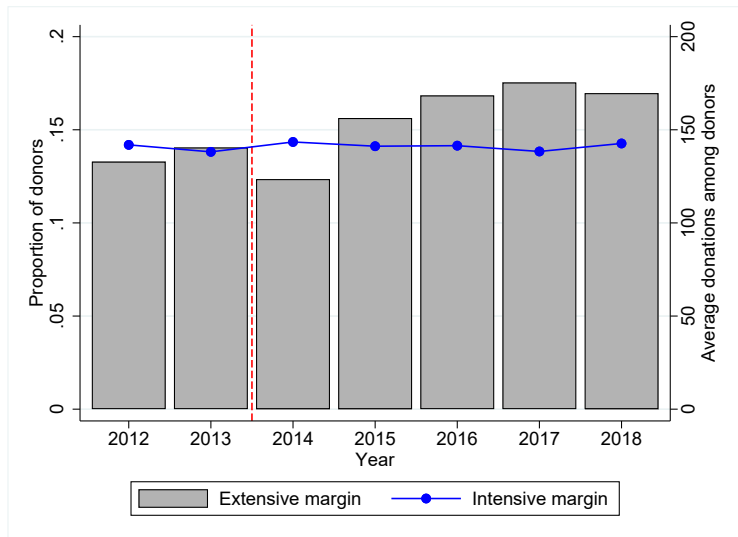


Figure 1: Proportion of Donors and Average Donations among Donors

# Summary Statistics of Covariates

Table 1: Summary Statistics of Covariates

	2012	2013	2014	2015
Female	0.51	0.51	0.52	0.52
Age	38.39	39.10	39.67	40.51
Annual taxable income	1699.86	1764.04	1838.76	1872.54
University graduate	0.28	0.28	0.29	0.30
High school graduate	0.30	0.30	0.31	0.31
#.Respondents	14138	13984	13787	13524
#.Households	4756	4807	4819	4832

## Summary Statistics of Covariates (Cont'd)

Table 2: Summary Statistics of Covariates (Continued)

	2016	2017	2018
Female	0.52	0.52	0.52
Age	41.07	41.89	42.55
Annual taxable income	1906.91	1951.55	2039.47
University graduate	0.31	0.33	0.34
High school graduate	0.31	0.31	0.31
#.Respondents	13238	12963	12795
#.Households	4790	4770	4765



# What is Giving Price?

Consider allocation between private consumptions ( $x_i$ ) and charitable giving ( $g_i$ ). Let  $y_i$  be pre-tax total income. Then, the budget constraint is

$$x_i + g_i = y_i - T_i(y_i, g_i),$$

where  $T_i$  is tax amount depending on the pre-tax income and charitable giving.

# Determination of Tax Amount

Tax deduction reduces taxable income by giving, that is,

$$T_i = \tau(y_i - g_i) \cdot (y_i - g_i),$$

where  $\tau(\cdot)$  is the marginal income tax rate which is determined by  $y_i - g_i$ .

Tax credit reduces tax amount directly, that is,

$$T_i = \tau(y_i) \cdot y_i - mg_i,$$

where  $m \in [0, 1]$  is the tax credit rate.

## Derive Giving Price

Under the tax deduction system, the budget constraint is

$$x_i + [1 - \tau(y_i - g_i)]g_i = [1 - \tau(y_i - g_i)]y_i.$$

Thus, the giving price of tax deduction system is

$$p_i^d = 1 - \tau(y_i - g_i).$$

Under the tax credit system, the budget constraint is

$$x_i + (1 - m)g_i = [1 - \tau(y_i)]y_i.$$

Thus, the giving price of tax credit system is  $p_i^c = 1 - m$ .

# Construct Giving Price

In the South Korea, the tax policy about charitable giving drastically changed in 2014.

- ▶ tax deduction (before 2014):  $\text{Price}_i = 1 - \tau(y_i - g_i)$ 
  - ▶ the giving price is endogenous because people can manipulate  $\tau(y_i - g_i)$  using the charitable giving  $g_i$ . Since this problem is caused by *last* donations, we use the giving price applying to the *first* donations (**first price**). The first price is calculate by  $\tau(y_i)$  where  $y_i$  is the annual taxable income reported in the NaSTaB.
- ▶ tax credit (after 2014):  $\text{Price}_i = 1 - m$ 
  - ▶ In the South Korea, the tax credit rate determines exogeneity,  $m = 0.15$ .

# Income Distribution and Giving Price

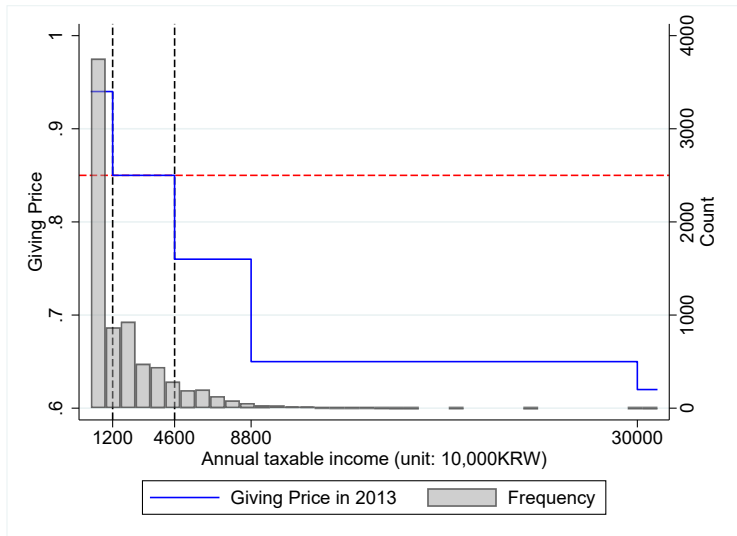


Figure 2: Income Distribution and Giving Price in 2013

## Price Elasticity

# Baseline Regressions

Our baseline regression equation is

$$\log(\text{Giving}_{ijt}) = \alpha_i + \beta_1 \log(\text{Price}_{ijt}) + \delta X_{ijt} + \lambda_t + \epsilon_{ijt}.$$

- ▶  $\log(\text{Giving}_{ijt})$  is logarithm of individual  $i$ 's charitable giving in year  $t$ .
- ▶  $\log(\text{Price}_{ijt})$  is logarithm of individual  $i$ 's giving price in year  $t$ .
- ▶  $\beta_1$  represents the price elasticity of giving.
- ▶  $\alpha_i$  and  $\lambda_t$  are individual and time fixed effect, respectively.

## Baseline Regressions: Result

We found the **price effect** of giving (1% price increase leads to about 1.1% giving decrease)

Table 3: Baseline Regressions

	(1)	(2)	(3)	(4)	(5)
ln(giving price)	-1.071*** (0.201)	-1.264*** (0.212)	-1.298*** (0.229)	-1.117*** (0.228)	-1.121*** (0.228)
Logged Income	Y	Y	Y	Y	Y
Age	N	Y	Y	Y	Y
Year X Educ	N	N	Y	Y	Y
Year X Gender	N	N	N	Y	Y
Resident Area	N	N	N	N	Y
N	54213	54213	54211	54211	54211



# Intensive Margin and Extensive Margin

Let  $D_{ijt}$  be a dummy variable taking 1 if individual  $i$  whose resident area  $j$  in year  $t$  donate in year  $t$

- ▶ Intensive margin: Estimate  $\beta_1$  where outcome variable is  $\log(\text{Giving}_{ijt})$ , using units with  $D_{ijt} = 1$ .
- ▶ Extensive margin: Estimate  $\beta_1$  where outcome variable is  $D_{ijt}$ .
  - ▶ Extensive-margin price elasticity can be calculated by  $\beta_1/\bar{D}$  where  $\bar{D}$  is the sample mean of  $D_{ijt}$ .

Covariates in each column corresponds to a column in a previous slide.

# Intensive Margin and Extensive Margin: Result

Table 4: Intensive-margin and Extensive-Margin Price Elasticity

	(1)	(2)	(3)	(4)	(5)
<b>Intensive Margin</b>					
ln(giving price)	-0.593*** (0.202) 11704	-0.843*** (0.212) 11704	-1.022*** (0.231) 11704	-0.887*** (0.242) 11704	-0.891*** (0.243) 11704
<b>Extensive Margin</b>					
ln(giving price)	-0.258*** (0.046)	-0.290*** (0.048)	-0.274*** (0.052)	-0.238*** (0.052)	-0.239*** (0.052)
Elasticity	-1.699*** (0.301) 54213	-1.907*** (0.316) 54213	-1.807*** (0.341) 54211	-1.569*** (0.341) 54211	-1.573*** (0.341) 54211

# Robustness Check 1

First potential concern: Income and donations are determined simultaneously

- ▶ This causes both a change of giving price and a change of an amount of donations
- ▶ Gruber and Saez (2002) provided that we should use  $\log(\text{Price}_{ijt}/\text{Price}_{ij(t-k)})$  as an instrument.
- ▶ We estimated the model (5) in the previous slide, using the panel IV model for  $k = 1, 2, 3$ .
  - ▶ Note that Alumnia (2020) took a strategy of  $k$ -difference model.

# Robustness Check 1: Result

Table 5: Panel IV Regressions

	k = 1	k = 2	k = 3
ln(giving price)	-1.279*** (0.478)	-1.155*** (0.414)	-1.150*** (0.369)
F-stat of IV	10315.94	11506.64	11569.61
N	51548	49217	46399

# Robustness Check 1: Intensive and Extensive Margin

Table 6: Intensive- and Extensive-Margin Price Elasticity: Panel IV

	k = 1	k = 2	k = 3
<b>Intensive Margin</b>			
ln(giving price)	-0.0004 (0.5687)	0.0261 (0.4410)	-0.4378 (0.3763)
F-stat of IV	1679.78	2040.66	2419.05
N	11332	10954	10451
<b>Extensive Margin</b>			
ln(giving price)	-0.3036*** (0.1101)	-0.2944*** (0.0934)	-0.2472*** (0.0847)
Elasticity	-2.000*** (0.725)	-1.939*** (0.615)	-1.628*** (0.558)
F-stat of IV	10315.94	11506.64	11569.61
N	51548	49217	46399

## Robust Check 2

Second potential concern: The effect of presidential transition on donations

- ▶ The presidential transition is one of our major omitted factor to affect both political trust and charitable giving.
- ▶ To shed light on this concern, we used data in 2013 and 2014 (President was Park Geun-hye in both years), and estimated the model (5) in the previous slide, using the fixed effect model and the panel IV model for  $k = 1, 2, 3$ .

## Robustness Check 2: Result

Table 7: Results with data in 2013 and 2014

	FE	Panel IV with FE		
		k = 1	k = 2	k = 3
ln(giving price)	-1.466*** (0.327)	-1.535*** (0.360)	-1.683*** (0.378)	-1.151*** (0.385)
F-stat of IV		7420.10	4490.74	5034.58
N	15134	13727	12902	12420

## Robustness Check 2: Intensive and Extensive Margin

Table 8: Intensive- and Extensive-Margin Price Elasticity with Data in 2013 and 2014

	FE	Panel IV with FE		
		k = 1	k = 2	k = 3
<b>Intensive Margin</b>				
ln(giving price)	-0.759** (0.344)	-0.736* (0.418)	-0.819** (0.404)	-0.543 (0.371)
F-stat of IV		1920.08	1762.03	1706.53
N	2938	2746	2615	2512
<b>Extensive Margin</b>				
ln(giving price)	-0.332*** (0.074)	-0.341*** (0.083)	-0.380*** (0.085)	-0.291*** (0.089)
Elasticity	-2.186*** (0.488)	-2.249*** (0.547)	-2.504*** (0.559)	-1.920*** (0.583)
F-stat of IV		7420.10	4490.74	5034.58
N	15134	13727	12902	12420



## Political Trust and Price Elasticity

# Estimation of Trust Index

The trust for politicians is time-varying variable because it depends on governments' policies. We make time-invariant trust index using the fixed effect model.

$$\text{Trust}_{ijt} = \text{Trustid}_{ij} + c_j \cdot \lambda_t + \lambda_t + \epsilon_{ijt}.$$

- ▶  $\text{Trust}_{ijt}$ : trust for politicians (5-Likert scale)
- ▶  $\text{Trustid}_i$ : individual fixed effect (**Trust index**)
- ▶  $c_j \cdot \lambda_t$  captures local governments' policies effect
- ▶  $\lambda_t$  captures the central government policies effect

# Histogram of Trust Index

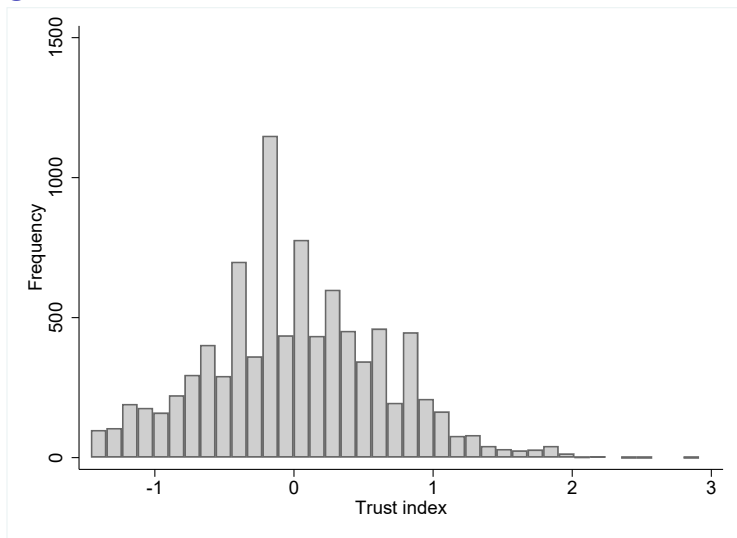


Figure 3: Histogram of Trust Index

# Heterogenous Price Elasticity by Political Trust

To see the heterogenous price elasticity by political trust, We estimated the baseline regression model (5) (see Table 3), using sample grouped by the trust index.

- ▶ Five quantile groups: we divide units  $i$  into the first, second, third, fourth, and fifth quantile of trust index (1Q, 2Q, 3Q, 4Q, and 5Q, respectively).
- ▶ Three quantile groups: we divide units  $i$  into the first, second, and third quantile of trust index (1Q, 2Q, and 3Q, respectively).

## Five Quantile Groups: Result

Ongoing now...

## Five Quantile Groups: Intensive and Extensive Margin

Ongoing now...

## Three Quantile Groups: Result

Table 9: Price Elasticity by Three Quantile Trust Groups

	1Q	2Q	3Q
ln(giving price)	-0.496 (0.398)	-1.635*** (0.391)	-1.157*** (0.410)
N	17421	16810	17075

## Three Quantile Groups: Intensive and Extensive Margin

Table 10: Intensive- and Extensive-Margin Price Elasticity by Three Quantile Trust Groups

	1Q	2Q	3Q
<b>Intensive Margin</b>			
ln(giving price)	-0.997** (0.408)	-0.980** (0.398)	-0.208 (0.450)
N	3516	3959	3917
<b>Extensive Margin</b>			
ln(giving price)	-0.131 (0.089)	-0.327*** (0.090)	-0.244*** (0.093)
Elasticity	-0.722 (0.487)	-1.571*** (0.433)	-1.088*** (0.416)
N	17421	16810	17075



## Gouvernement Efficient and Price Elasticity

# Government Efficiency

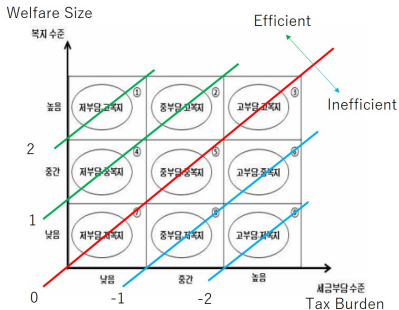
From the 2015 survey, NaSTaB asks the current and ideal balance between tax burden and welfare size.

These variables provide us to investigate the relationship between price elasticity and government's efficiency more directly.

Thus, we did same exercise, using the current balance between tax burden and welfare size.

# Construct Efficient Index

Questionnaire of tax-welfare balance index is



To rule out government's policies, we use individual fixed effect as the **tax-welfare size index**

# Histogram of Efficient Index

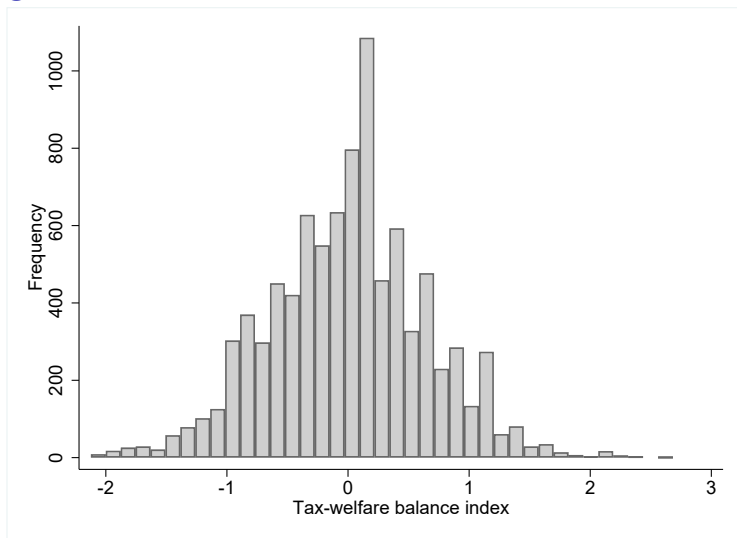


Figure 4: Histogram of Efficient Index

# Heterogenous Price Elasticity by Gouvernement Efficiency

To see the heterogenous price elasticity by efficient index, We estimated the baseline regression model (5) (see Table 3), using sample grouped by the efficient index.

- ▶ Five quantile groups: we divide units  $i$  into the first, second, third, fourth, and fifth quantile of efficient index (1Q, 2Q, 3Q, 4Q, and 5Q, respectively).
- ▶ Three quantile groups: we divide units  $i$  into the first, second, and third quantile of efficient index (1Q, 2Q, and 3Q, respectively).

## Five Quantile Groups: Result

Ongoing now...

## Five Quantile Groups: Intensive and Extensive Margin

Ongoing now...

## Three Quantile Groups: Result

Table 11: Price Elasticity by Three Quantile Efficient Groups

	1Q	2Q	3Q
ln(giving price)	-1.321*** (0.388)	-0.844** (0.404)	-0.929** (0.404)
N	17119	16662	17525



## Three Quantile Groups: Intensive and Extensive Margin

Table 12: Intensive- and Extensive-Margin Price Elasticity by Three Quantile Efficient Groups

	1Q	2Q	3Q
<b>Intensive Margin</b>			
ln(giving price)	-0.792** (0.383)	-0.360 (0.423)	-1.111** (0.497)
N	3696	3591	4105
<b>Extensive Margin</b>			
ln(giving price)	-0.276*** (0.087)	-0.225** (0.094)	-0.174* (0.091)
Elasticity	-1.380*** (0.435)	-1.115** (0.466)	-0.787* (0.412)
N	17119	16662	17525