

# 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

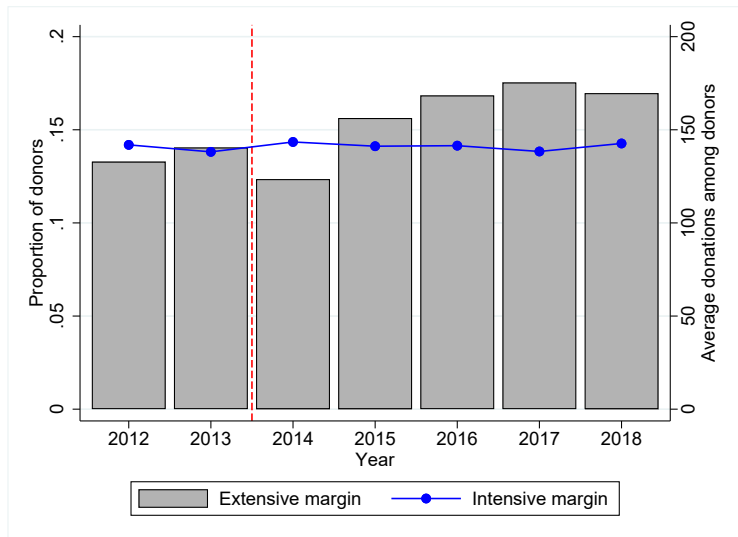


Figure 1: Proportion of Donors and Average Donations among Donors

# 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

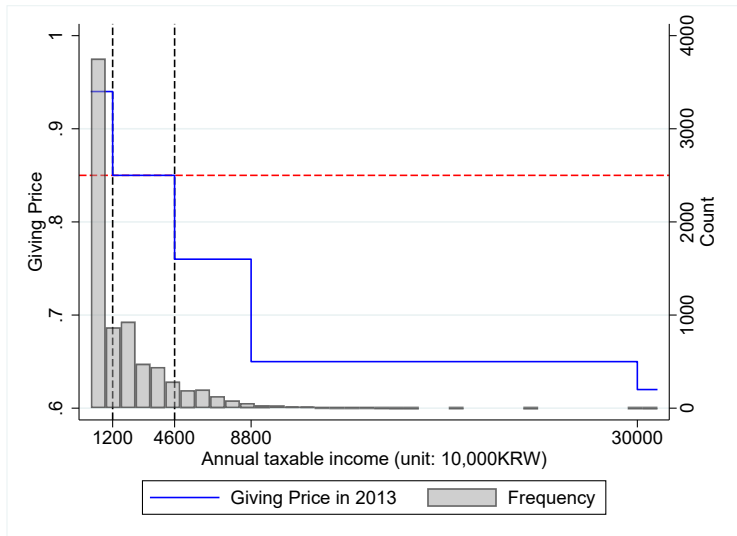


Figure 2: Income Distribution and Giving Price in 2013

## Time Series of Average Donations By Benefit Group

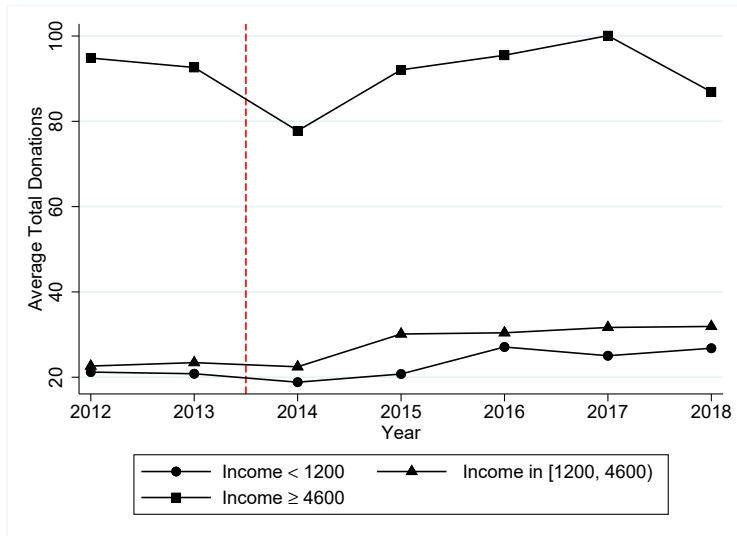


Figure 3: Time Series of Average Donations by Benefit Group

## Time Series of Extensive Margin by Benefit Group

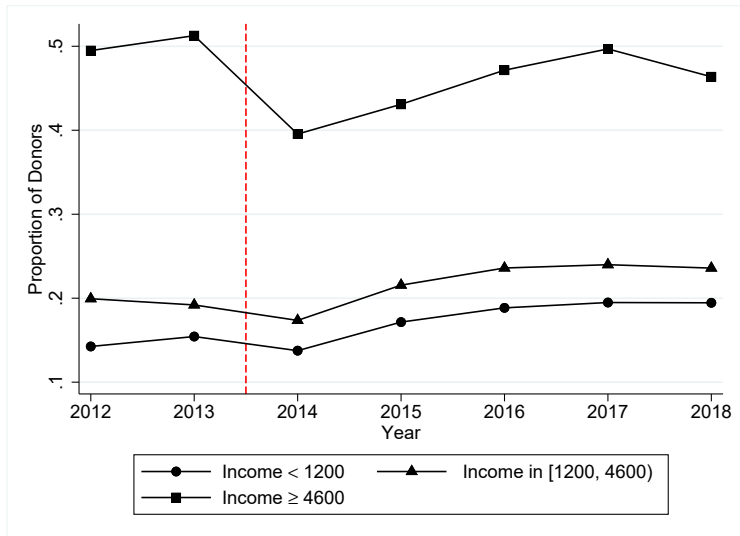


Figure 4: Time Series of Proportion of Donors by Benefit Group

## Time Series of Intensive Margin by Benefit Group

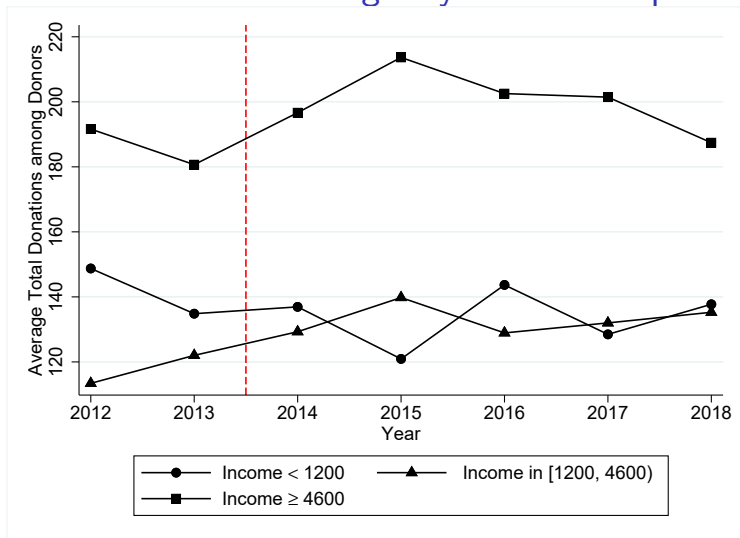


Figure 5: Time Series of Average Donations among Donors by Benefit Group



## 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. Income and donations are determined simultaneously
2. Effect of presidential transition on donation behavior
3. Last price elasticity
4. Self-selection of receiving tax benefit
5. Transitory and permanent elasticity

# 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 charitable giving.
  - ▶ In May 2017, South Korea president changed from Park Geun-hye to Moon Jae-in. This presidential transition was due to the impeachment charge against Park Geun-hye. People became distrustful of her due to the sinking of MV Sewol (April 2014).
- ▶ 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

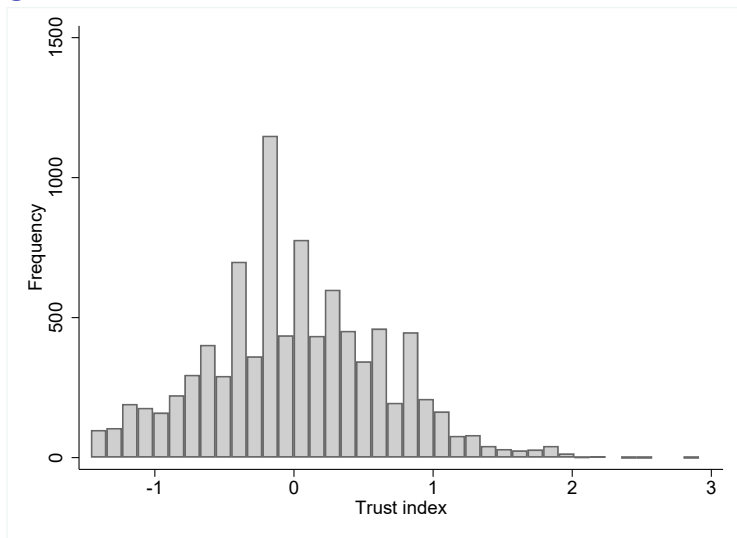


Figure 6: Histogram of Trust Index

# 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.

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



## Trust Groups: Descriptive Stats

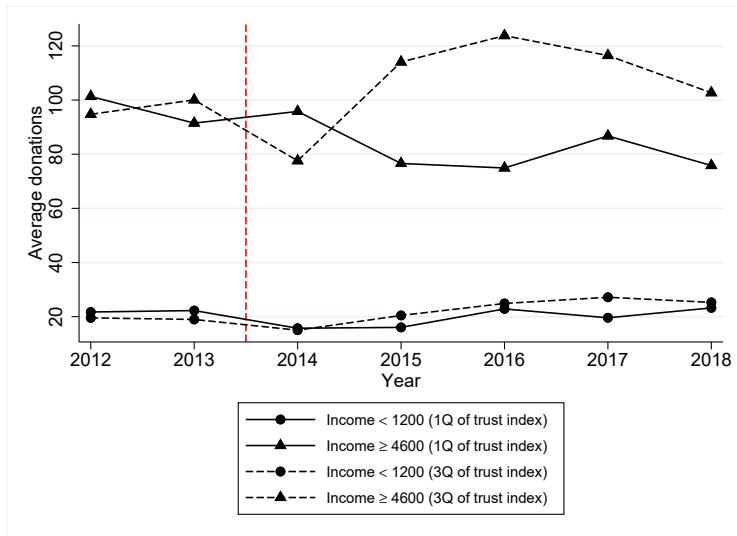


Figure 7: Time Series of Average Donations by Subgroup

# Trust Groups: Descriptive Statis (Extensive Margin)

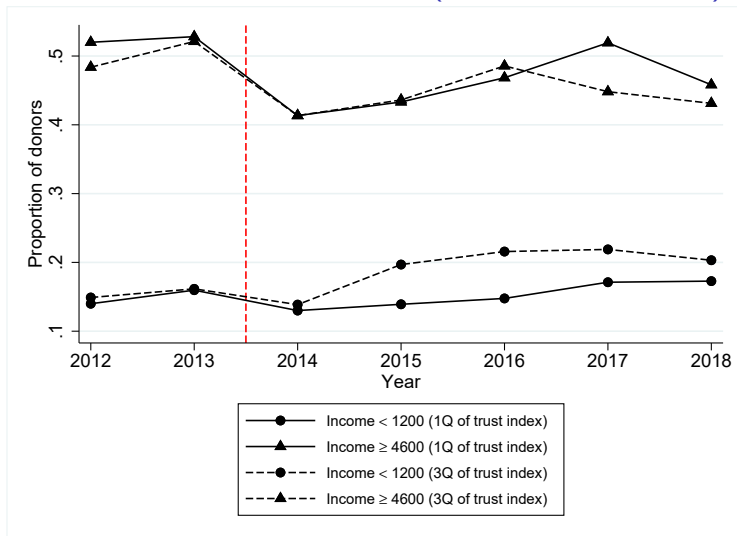


Figure 8: Time Series of Proportion of Donors by Subgroup

## Trust Groups: Descriptive Stats (Intensive Margin)

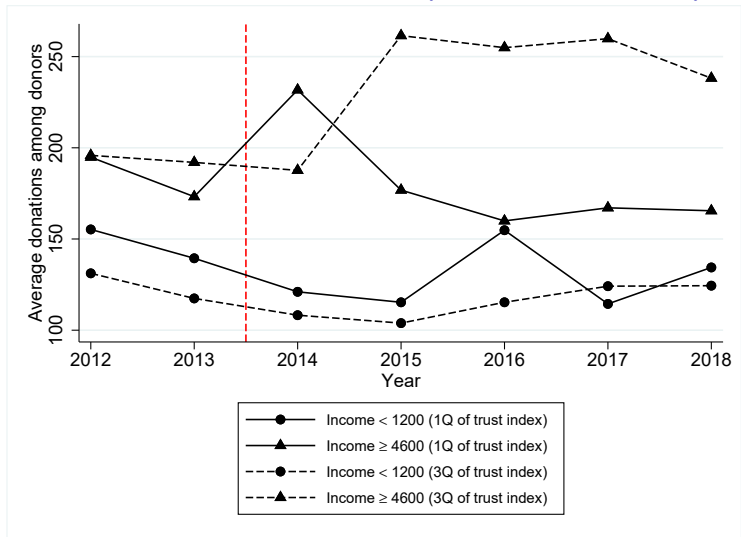


Figure 9: Time Series of Average Donations among Donors by Subgroup

# Trust Groups: Estimation Result

Table 9: Price Elasticity by Three Quantile Trust Groups

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

# Robustness Check

1. Effect of presidential transition on trust index
2. Effect of presidential transition on donation behavior
3. Income and donations are determined simultaneously
4. Last price elasticity
5. Self-selection of receiving tax benefit
6. Transitory and permanent elasticity

# Robustness Check 1: Presidential Transition Effect on Trust

- ▶ Even though we control time fixed effect when estimating the trust index, we may not rule out the effect of presidential transition on it perfectly.
- ▶ To check this point, we repeat estimate the same model using either data in 2015 and 2016 (Park's trust index) or in 2017 and 2018 (Moon's trust index), and obtain the president-specific trust indexes. After that, we test whether the average individual difference b/w these two indexes is statistically different from zero (pair-wise t-test).
- ▶ As a result, the average individual difference is -0.008 (s.e. = 0.01). This difference is not statistically different from zero (p-value = 0.446).

## Robustness Check 2

We check the following two potential concerns

- ▶ Presidential transition effect on donation behavior
- ▶ Income and donations are determined simultaneously

To address these problems, we estimate the FE model and Panel IV model with FE where instrument is  $\log(\text{Price}_{ijt}/\text{Price}_{ij(t-k)})$  for  $k = 1, 2, 3$ , using data in 2013 and 2014.

Note that f-statistics of IV is greater than 1000 when we estimate overall elasticity and extensive-margin elasticity, and greater than 400 when we estimate the intensive-margin elasticity.

## Robustness Check 2: Result

Table 10: Robustness Check of Heterogenous Price Elasticity by Political Trust

	1Q	2Q	3Q
<b>FE Model</b>			
ln(giving price)	-0.485 (0.564)	-2.901*** (0.563)	-1.164* (0.623)
N	4713	4489	4586
<b>Panel IV (k = 1)</b>			
ln(giving price)	-0.347 (0.639)	-3.307*** (0.602)	-1.242* (0.656)
N	4337	4109	4190
<b>Panel IV (k = 2)</b>			
ln(giving price)	-0.617 (0.627)	-3.314*** (0.689)	-1.204* (0.702)
N	4100	3839	3975
<b>Panel IV (k = 3)</b>			
ln(giving price)	-0.230 (0.684)	-2.536*** (0.673)	-0.807 (0.691)
N	3947	3700	3832



## Robustness Check 2: Result (Extensive Margin)

Table 11: Robustness Check of Heterogenous Extensive-Margin Price Elasticity by Political Trust

	1Q	2Q	3Q
<b>FE Model</b>			
Implied Elasticity	-0.834 (0.728)	-3.347*** (0.672)	-1.386* (0.774)
N	4713	4489	4586
<b>Panel IV (k = 1)</b>			
Implied Elasticity	-0.438 (0.816)	-3.880*** (0.732)	-1.658* (0.846)
N	4337	4109	4190
<b>Panel IV (k = 2)</b>			
Implied Elasticity	-1.082 (0.805)	-3.864*** (0.797)	-1.223 (0.878)
N	4100	3839	3975
<b>Panel IV (k = 3)</b>			
Implied Elasticity	-0.852 (0.881)	-3.176*** (0.806)	-0.850 (0.893)
N	3947	3700	3832

## Robustness Check 2: Result (Intensive Margin)

Table 12: Robustness Check of Heterogenous Intensive-Margin Price Elasticity by Political Trust

	1Q	2Q	3Q
<b>FE Model</b>			
ln(giving price)	-0.946* (0.540)	-0.969* (0.575)	-0.622 (0.673)
N	904	958	931
<b>Panel IV (k = 1)</b>			
ln(giving price)	-1.408** (0.636)	-0.687 (0.710)	-0.396 (0.841)
N	847	898	881
<b>Panel IV (k = 2)</b>			
ln(giving price)	-1.117* (0.651)	-0.912 (0.657)	-0.696 (0.787)
N	812	850	844
<b>Panel IV (k = 3)</b>			
ln(giving price)	-0.640 (0.609)	-0.611 (0.596)	-0.327 (0.698)
N	777	819	816

## Gouvernement Efficient and Price Elasticity

# Government Efficiency

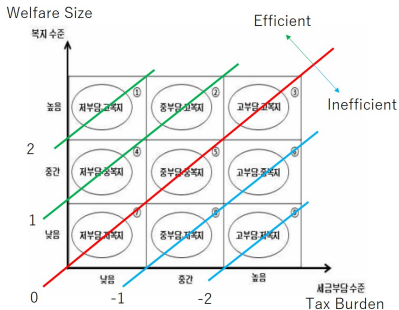
From the 2015 survey, NaSTaB asks the current and ideal balance between tax burden and welfare size.

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 **efficient index**

# Histogram of Efficient Index

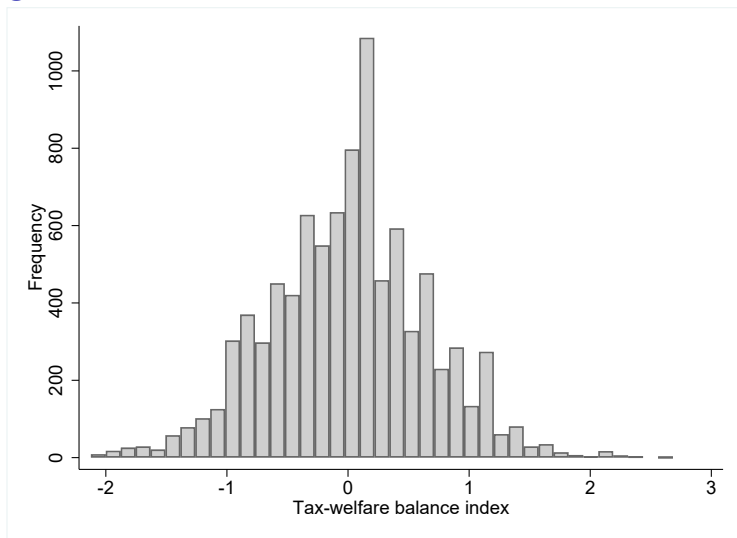


Figure 10: Histogram of Efficient Index

# 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.

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

## Efficient Groups: Descriptive Stats

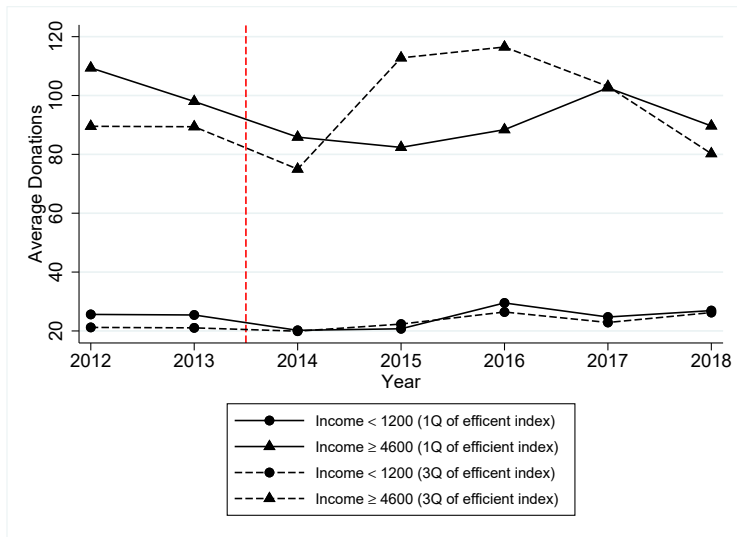


Figure 11: Time Series of Average Donations by Subgroup



## Efficient Groups: Descriptive Statis (Extensive Margin)

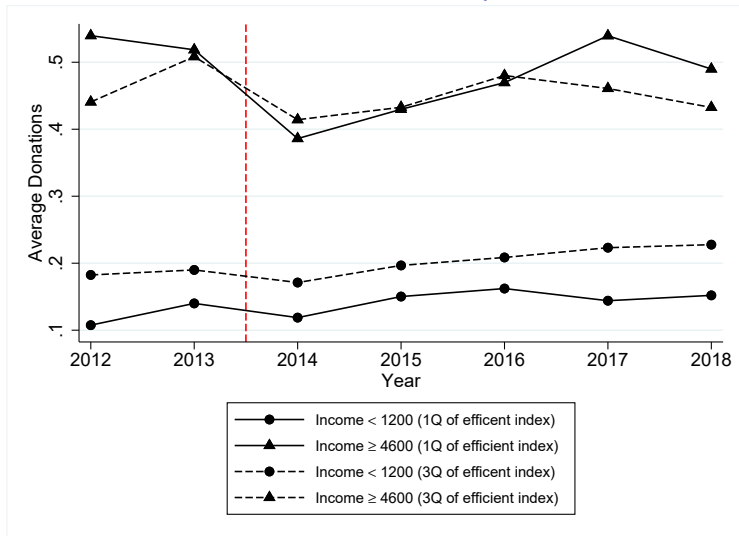


Figure 12: Time Series of Proportion of Donors by Subgroup

## Efficient Groups: Descriptive Stats (Intensive Margin)

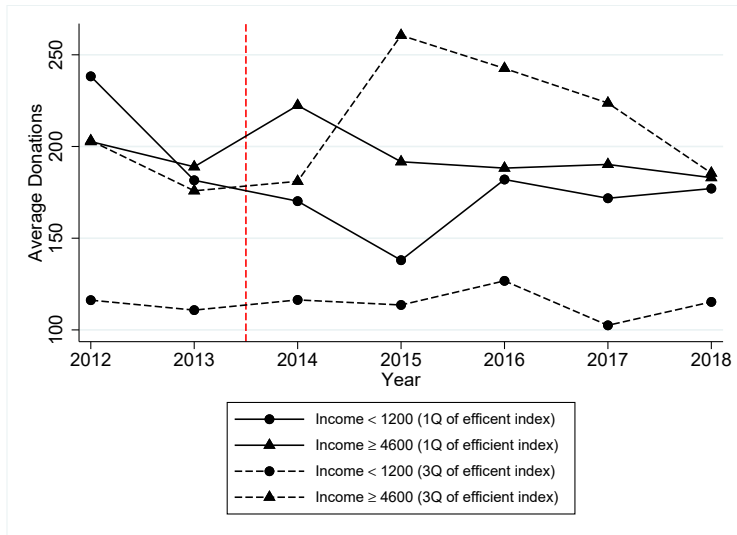


Figure 13: Time Series of Average Donations among Donors by Subgroup

## Efficient Groups: Estimation Results

Table 13: Price Elasticity by Three Quantile Efficient Groups

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

# Robustness Check

1. Efficient index captures both government efficiency on concerns about budget deficits
2. Effect of presidential transition on efficient index
3. Effect of presidential transition on donation behavior
4. Income and donations are determined simultaneously
5. Last price elasticity
6. Self-selection of receiving tax benefit
7. Transitory and permanent elasticity

# Robustness Check 1

- ▶ Efficient index may capture both government efficiency on concerns about budget deficits
  - ▶ NASTAB asks respondents to answer the ideal balance b/w tax burdern and welfare size.
  - ▶ We constructed the **ideal** efficient index, using the FE model to estimate the efficient index.
  - ▶ We dropped units with the ideal efficient index is less than 0 from each quantile group and repeated the same excercise.
  - ▶ This is because respondents whose the ideal efficient index is less than 0 think governments should try to avoid budget deficits (high tax, low welfare).
- ▶ Presidential transition effect on perceived efficiency
  - ▶ We constructed president-specific (ideal) efficient index and implemented the pair-wise t-test.
  - ▶ As a result, average difference of these two indexes are not statistically signigificant zero.

# Robustness Check 1: Estimation Results

Table 14: Heterogenous Price Elasticity by Efficiency Using Units with Ideal Efficient Index  $> 0$

	1Q	2Q	3Q
<b>Overall</b>			
ln(giving price)	-1.996*** (0.648)	-1.122* (0.597)	-0.063 (0.488)
N	7527	6900	9339
<b>Intensive Margin</b>			
ln(giving price)	-1.138* (0.640)	-0.900 (0.652)	-0.952 (0.741)
N	1541	1474	2023
<b>Extensive Margin</b>			
ln(giving price)	-0.317** (0.136)	-0.220 (0.137)	0.014 (0.119)
Elasticity	-1.582** (0.681)	-1.091 (0.679)	0.062 (0.537)
N	7527	6900	9339

## Robustness Check 2

We check the following two potential concerns

- ▶ Presidential transition effect on donation behavior
- ▶ Income and donations are determined simultaneously

To address these problems, we estimated the FE model and Panel IV model with FE where instrument is  $\log(\text{Price}_{ijt}/\text{Price}_{ij(t-k)})$  for  $k = 1, 2, 3$ , using data in 2013 and 2014. Moreover, we dropped units with the ideal efficient index  $< 0$  from each quantile group.

Note that f-statistics of IV is greater than 500 when we estimate overall elasticity and extensive-margin elasticity, and greater than 100 when we estimate the intensive-margin elasticity.

## Robustness Check 2: Result

Table 15: Robustness Check of Heterogenous Price Elasticity by Government Efficiency

	1Q	2Q	3Q
<b>FE Model</b>			
ln(giving price)	-1.989** (0.913)	-1.047 (1.078)	-1.881** (0.835)
N	2021	1841	2504
<b>Panel IV (k = 1)</b>			
ln(giving price)	-1.881* (0.992)	-1.093 (1.272)	-2.189** (0.851)
N	1842	1689	2292
<b>Panel IV (k = 2)</b>			
ln(giving price)	-1.958* (1.101)	-1.594 (1.212)	-1.684 (1.024)
N	1723	1582	2174
<b>Panel IV (k = 3)</b>			
ln(giving price)	-1.608 (1.079)	-0.317 (1.219)	-1.544 (0.999)
N	1645	1529	2096



## Robustness Check 2: Result (Extensive Margin)

Table 16: Robustness Check of Heterogenous Extensive-Margin Price Elasticity by Government Efficiency

	1Q	2Q	3Q
<b>FE Model</b>			
Implied Elasticity	-1.558 (1.119)	-0.649 (1.326)	-2.453** (1.147)
N	2021	1841	2504
<b>Panel IV (k = 1)</b>			
Implied Elasticity	-1.345 (1.255)	-0.517 (1.612)	-2.934** (1.180)
N	1842	1689	2292
<b>Panel IV (k = 2)</b>			
Implied Elasticity	-1.396 (1.264)	-1.557 (1.486)	-1.998 (1.439)
N	1723	1582	2174
<b>Panel IV (k = 3)</b>			
Implied Elasticity	-1.056 (1.262)	-0.460 (1.477)	-1.795 (1.355)
N	1645	1529	2096

## Robustness Check 2: Result (Intensive Margin)

Table 17: Robustness Check of Heterogenous Intensive-Margin Price Elasticity by Government Efficiency

	1Q	2Q	3Q
<b>FE Model</b>			
ln(giving price)	-0.753 (0.848)	-2.301* (1.310)	-1.362 (0.956)
N	404	361	479
<b>Panel IV (k = 1)</b>			
ln(giving price)	-0.749 (1.088)	-3.220* (1.812)	-1.471 (1.013)
N	380	340	449
<b>Panel IV (k = 2)</b>			
ln(giving price)	-0.770 (0.997)	-1.216 (1.504)	-0.771 (0.966)
N	357	322	433
<b>Panel IV (k = 3)</b>			
ln(giving price)	0.573 (1.117)	-0.691 (1.088)	-1.472 (0.991)
N	337	307	414