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 goverment.
- 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 $\sim$ 2019
  - We use survey data after 2013 to focus on tax policy change in 2014.

Time Series of Chariable Giving

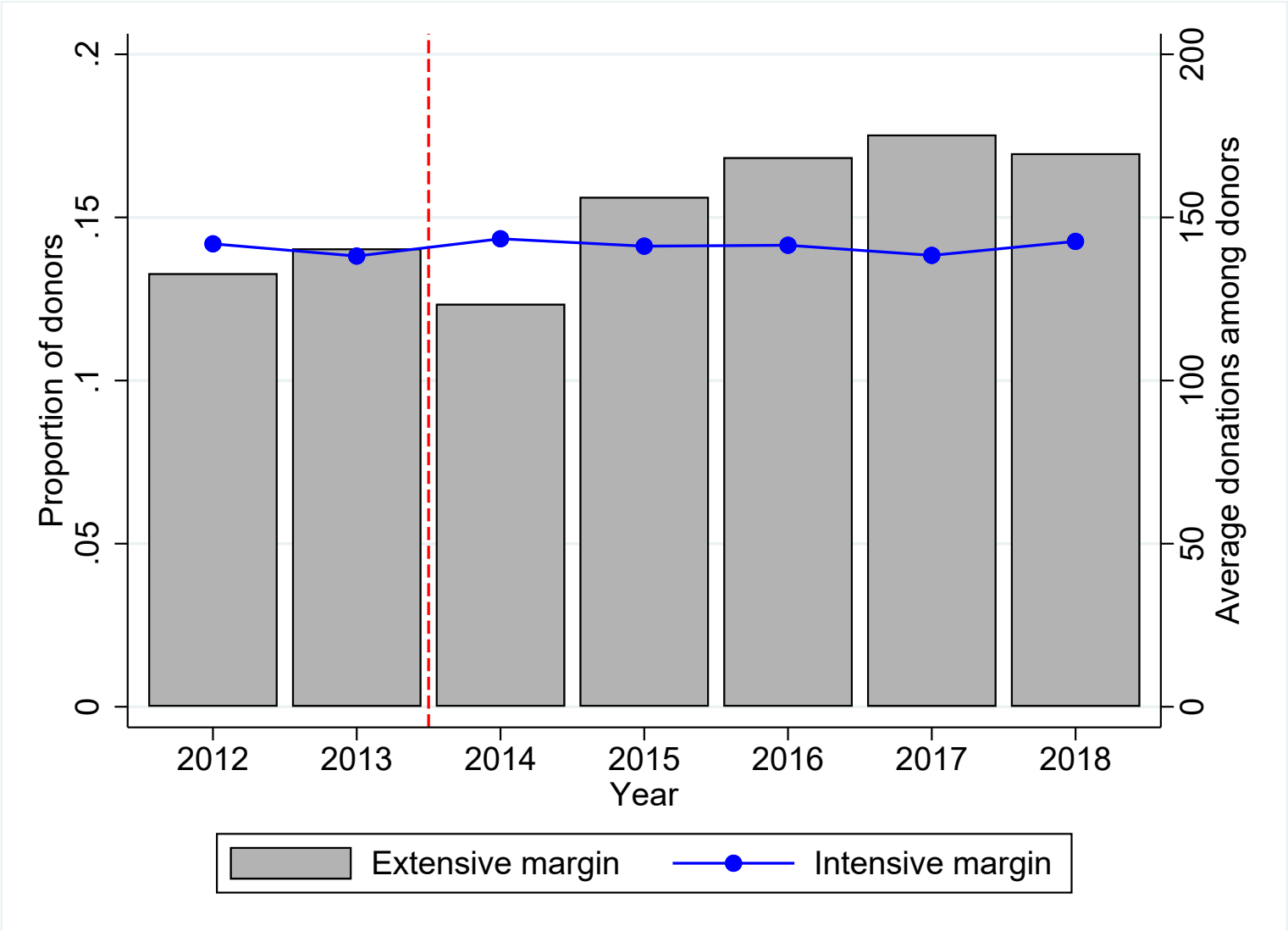


Figure 1: Proportion of Donors and Average Donations among Donors

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

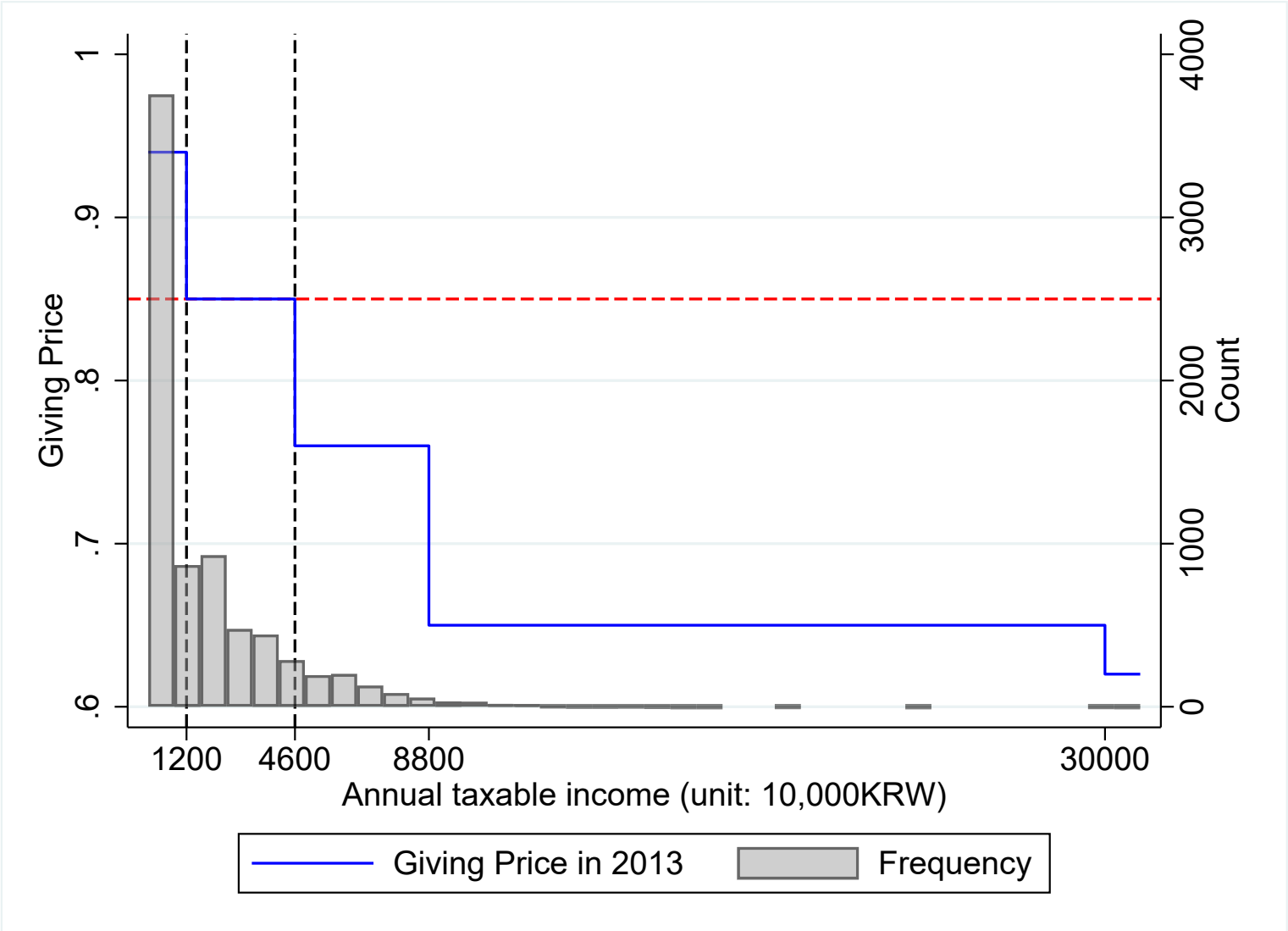


Figure 2: Income Distribution and Giving Price in 2013

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.
- β_1 represents the price elasticity of giving.
- α_i and λ_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***	-1.264***	-1.298***	-1.117***	-1.121***
	(0.201)	(0.212)	(0.229)	(0.228)	(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: Estiamte β_1 where outcome variable is $\log(\text{Giving}_{ijt})$, using units with $D_{ijt} = 1$.
- Extensive margin: Estimate β_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)
Intensive Margin					
ln(giving price)	-0.593***	-0.843***	-1.022***	-0.887***	-0.891***
	(0.202)	(0.212)	(0.231)	(0.242)	(0.243)
	11704	11704	11704	11704	11704
Extensive Margin					
ln(giving price)	-0.258***	-0.290***	-0.274***	-0.238***	-0.239***
	(0.046)	(0.048)	(0.052)	(0.052)	(0.052)
Elasticity	-1.699***	-1.907***	-1.807***	-1.569***	-1.573***
	(0.301)	(0.316)	(0.341)	(0.341)	(0.341)
	54213	54213	54211	54211	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 insturment.
- 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***	-1.155***	-1.150***
	(0.478)	(0.414)	(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
Intensive Margin			
ln(giving price)	-0.0004	0.0261	-0.4378
	(0.5687)	(0.4410)	(0.3763)
F-stat of IV	1679.78	2040.66	2419.05
N	11332	10954	10451
Extensive Margin			
ln(giving price)	-0.3036***	-0.2944***	-0.2472***
	(0.1101)	(0.0934)	(0.0847)
Elasticity	-2.000***	-1.939***	-1.628***
	(0.725)	(0.615)	(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 ommited 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***	-1.535***	-1.683***	-1.151***
	(0.327)	(0.360)	(0.378)	(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
Intensive Margin				
ln(giving price)	-0.759**	-0.736*	-0.819**	-0.543
	(0.344)	(0.418)	(0.404)	(0.371)
F-stat of IV		1920.08	1762.03	1706.53
N	2938	2746	2615	2512
Extensive Margin				
ln(giving price)	-0.332***	-0.341***	-0.380***	-0.291***
	(0.074)	(0.083)	(0.085)	(0.089)
Elasticity	-2.186***	-2.249***	-2.504***	-1.920***
	(0.488)	(0.547)	(0.559)	(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 politicans is time-varying variable because it depends on governments' policies. We make time-invarying trust index using the fixed effect model.

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

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

Histrogram of Trust Index

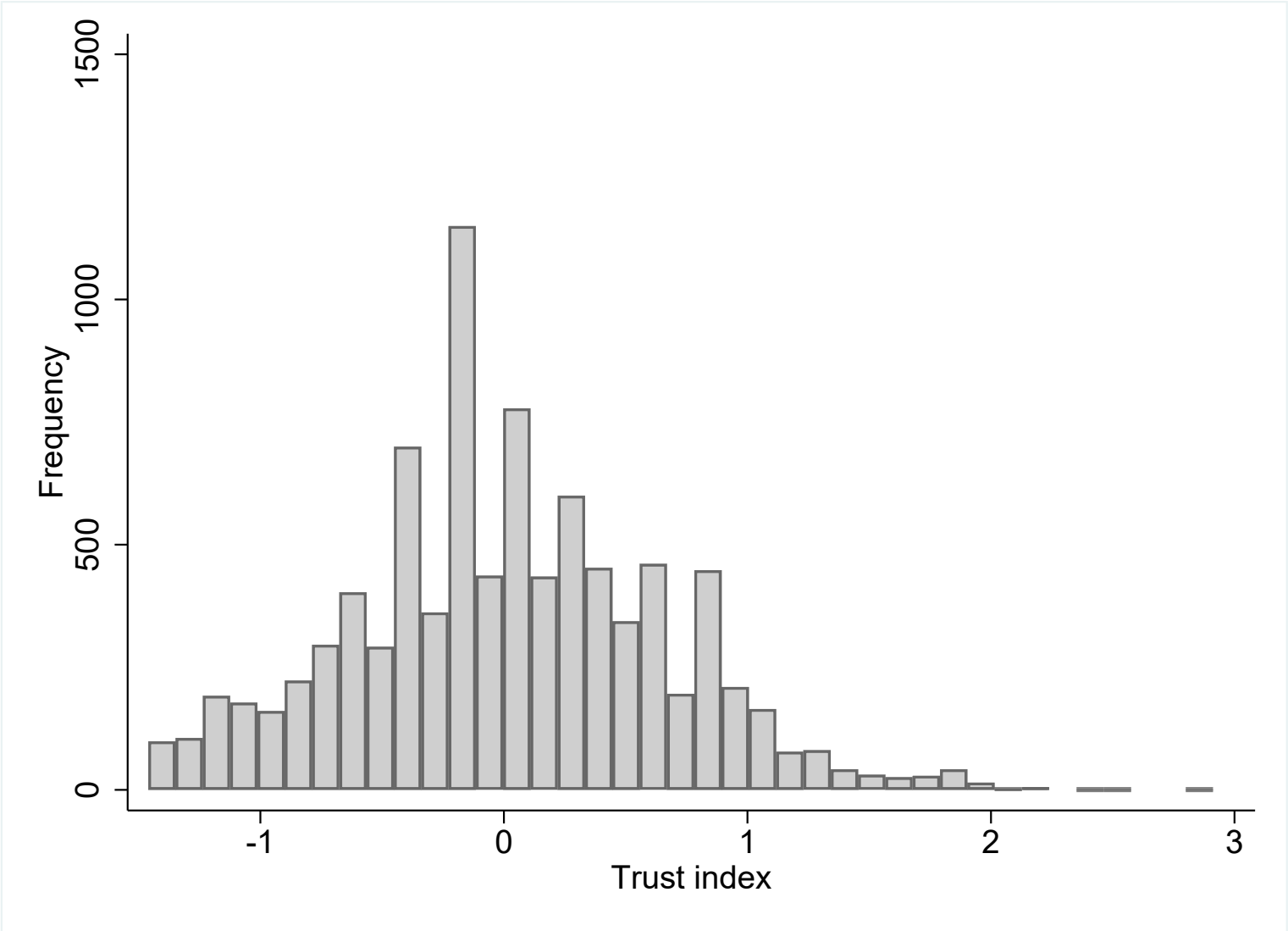


Figure 3: Histogram of Trust Index

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

Table 9: Subgroup Regressions

	1Q	2Q	3Q	4Q	5Q
ln(giving price)	-0.673	-0.452	-1.707***	-1.130**	-1.397**
	(0.557)	(0.462)	(0.479)	(0.524)	(0.563)
N	10250	10532	10286	10558	9680

Five Quantile Groups: Intensive and Extensive Margin

Table 10: Subgroup Regressions

	1Q	2Q	3Q	4Q	5Q
Intensive Margin					
ln(giving price)	-0.792	-1.118**	-0.531	-0.806	-0.122
	(0.624)	(0.463)	(0.463)	(0.577)	(0.626)
N	1968	2326	2445	2517	2136
Extensive Margin					
ln(giving price)	-0.203*	-0.061	-0.394***	-0.146	-0.359***
	(0.122)	(0.105)	(0.113)	(0.114)	(0.128)
Elasticity	-1.113*	-0.294	-1.755***	-0.659	-1.780***
	(0.672)	(0.502)	(0.504)	(0.516)	(0.635)
N	10250	10532	10286	10558	9680

Three Quantile Groups: Result

Table 11: Price Elasticity by Three Quantile Trust Groups

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

Three Quantile Groups: Intensive and Extensive Margin

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

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

Governement Efficient and Price Elasticity

Government Efficiency

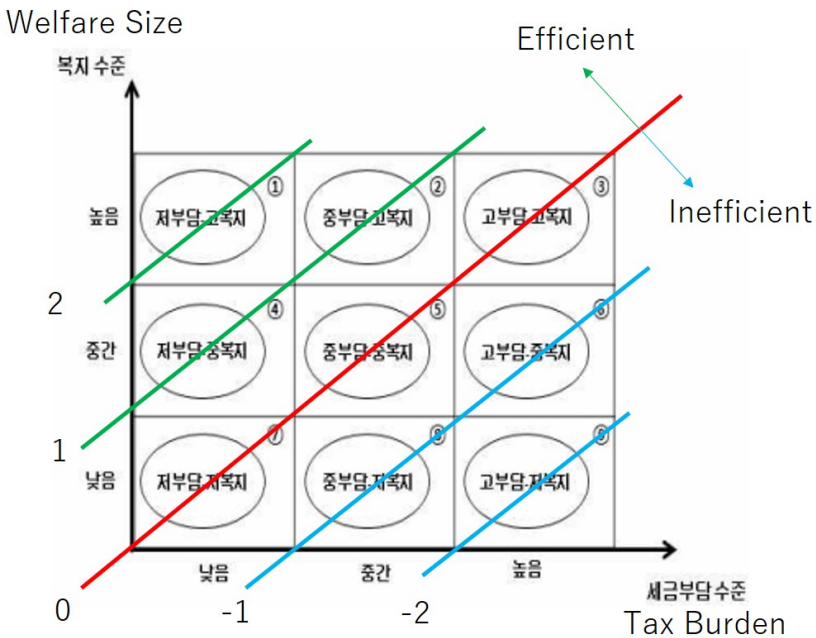
From the 2015 survey, NaSTaB asks the current and ideal balance between tax burden and welfare size.

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

Thus, we did same excercise, using the current balance bewteen 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-welare size index**

Histrogram of Efficient Index

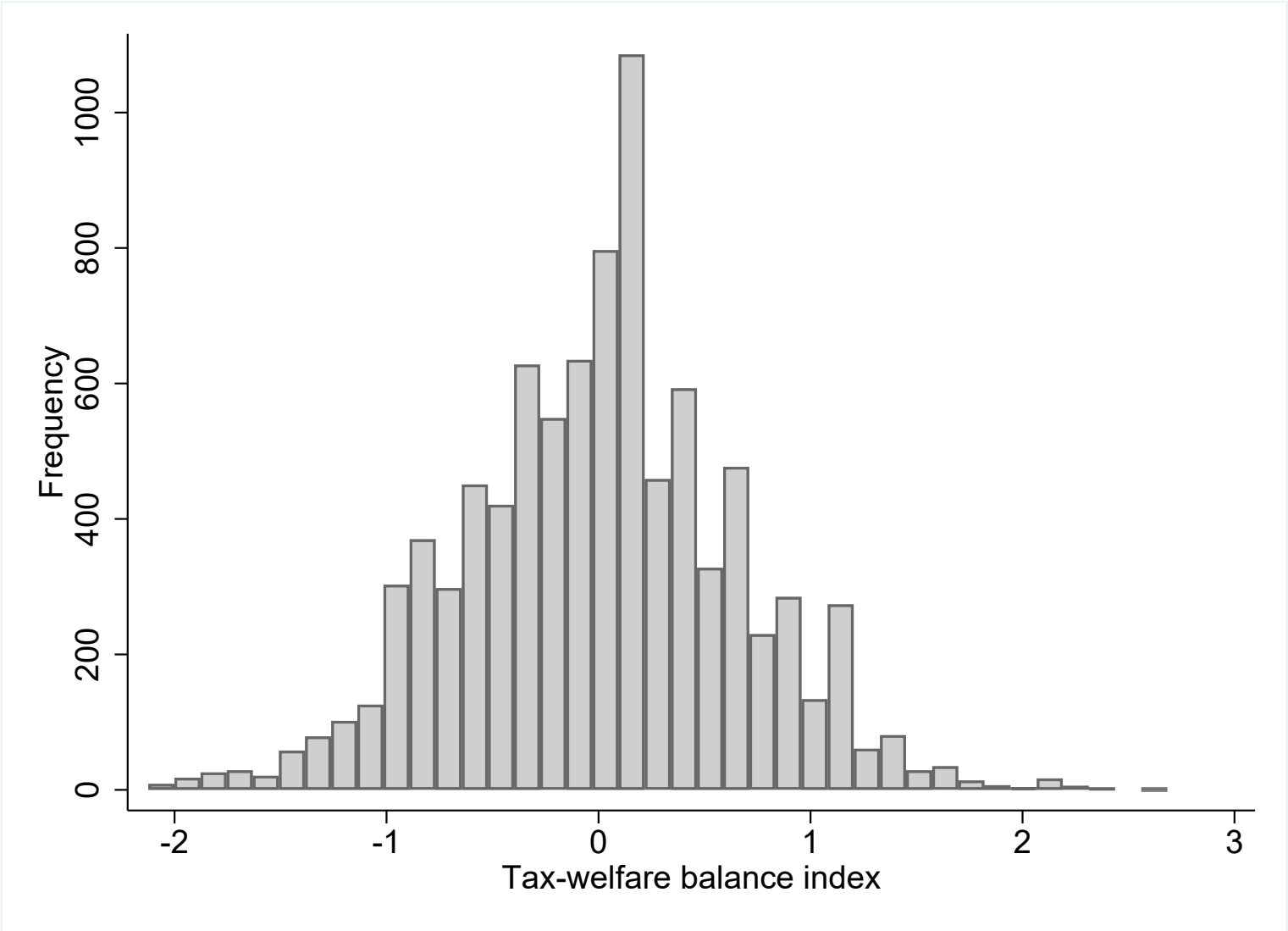


Figure 4: Histogram of Efficient Index

Heterogenous Price Elasticity by Governement 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

Table 13: Subgroup Regressions

	1Q	2Q	3Q	4Q	5Q
ln(giving price)	-1.281***	-0.773	-1.429***	-1.021**	-0.739
	(0.492)	(0.495)	(0.543)	(0.494)	(0.544)
N	9795	11369	9561	10411	10170

Five Quantile Groups: Intensive and Extensive Margin

Table 14: Subgroup Regressions

	1Q	2Q	3Q	4Q	5Q
Intensive Margin					
ln(giving price)	-0.959*	-0.321	-0.530	-0.927	-0.999*
	(0.514)	(0.447)	(0.601)	(0.648)	(0.598)
N	2167	2405	1978	2352	2490
Extensive Margin					
ln(giving price)	-0.263**	-0.178	-0.349***	-0.231**	-0.106
	(0.108)	(0.116)	(0.124)	(0.114)	(0.119)
Elasticity	-1.304**	-0.881	-1.813***	-1.078**	-0.462
	(0.534)	(0.574)	(0.644)	(0.534)	(0.521)
N	9795	11369	9561	10411	10170

Three Quantile Groups: Result

Table 15: Price Elasticity by Three Quantile Efficient Groups

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

Three Quantile Groups: Intensive and Extensive Margin

Table 16: Intensive- and Extensive-Margin Price Elasticity by Three Quantile Efficient Groups

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