

Charitable Giving, Tax Reform, and Political Trust

Hiroki Kato¹ Tsuyoshi Goto² Yong-Rok Kim³

¹Osaka University

²Chiba University

³Kobe University

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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

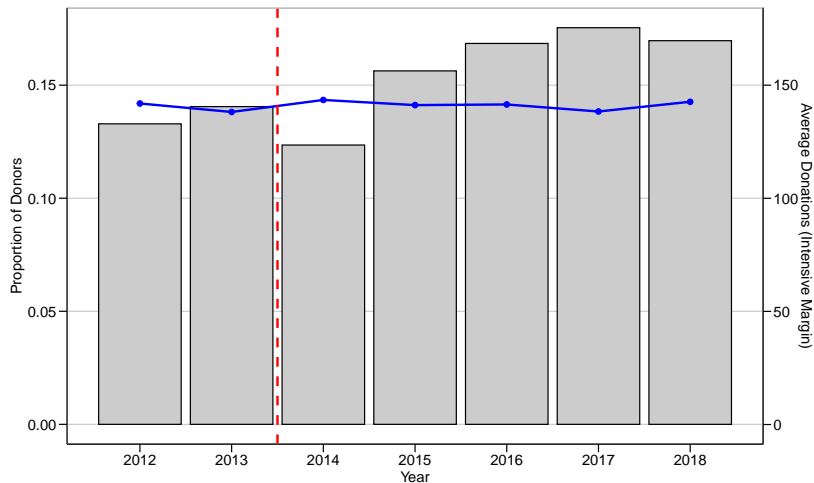


Figure 1: Proportion of Donors (bar chart) and Average Donations among Donors (blue line)

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
Education				
Junior High School Graduate	0.42	0.41	0.40	0.39
High School Graduate	0.30	0.30	0.31	0.31
University Graduate	0.28	0.28	0.29	0.30
#.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
Education			
Junior High School Graduate	0.38	0.37	0.35
High School Graduate	0.31	0.31	0.31
University Graduate	0.31	0.33	0.34
#.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

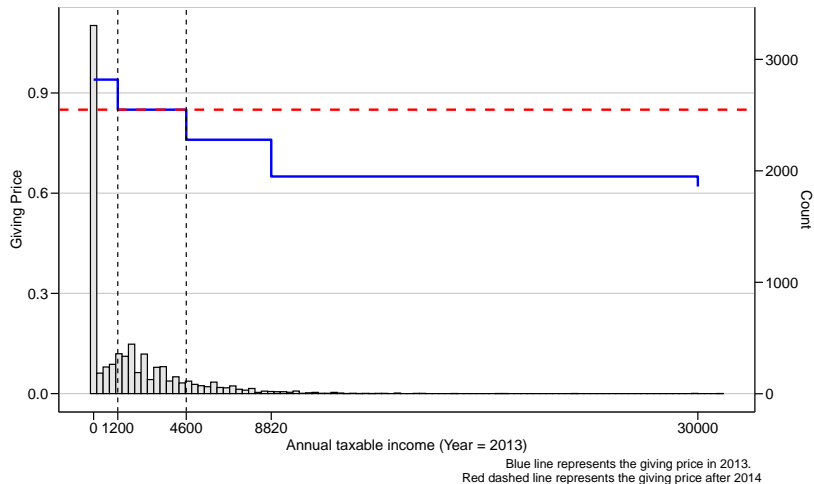


Figure 2: Income Distribution and Giving Price

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.

Result of Baseline Regressions

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)	-1.071*** (0.201)	-1.229*** (0.227)	-1.059*** (0.226)	-1.062*** (0.226)
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
Obs	54213	54213	54211	54211	54211

Robustness Check

We addressed the following two potential concerns:

1. 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.
 - ▶ Following Alumina et al. (2020), we estimated the model (5) in the previous slide, using the panel IV model for $k = 1, 2, 3, 4$.
2. 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 $k = 1, 2, 3, 4$.

Result of Robustness Check 1

We obtained similar value of price elasticity to baseline results (1% price increase leads to about 1.1% giving decrease)

Table 4: Panel IV Regressions

	k = 1	k = 2	k = 3	k = 4
ln(giving price)	-1.160** (0.473)	-1.088*** (0.411)	-1.138*** (0.368)	-0.941*** (0.336)
F-stat of IV	10671.085	11547.015	11742.698	9585.022
Obs	51982	49707	46878	43651

Result of Robustness Check 2

We obtained **stronger** price effect than baseline (1% price increase leads to about 1.2 ~ 1.6% giving decrease)

Table 5: Results with data in 2013 and 2014

	FE	Panel IV with FE			
		k = 1	k = 2	k = 3	k = 4
ln(giving price)	-1.466*** (0.327)	-1.497*** (0.355)	-1.628*** (0.375)	-1.207*** (0.381)	-1.331*** (0.395)
F-stat of IV		7374.556	4635.809	5157.662	5207.029
Obs	15134	13870	13095	12564	11774

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.

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

- ▶ 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

Histogram of Trust Index

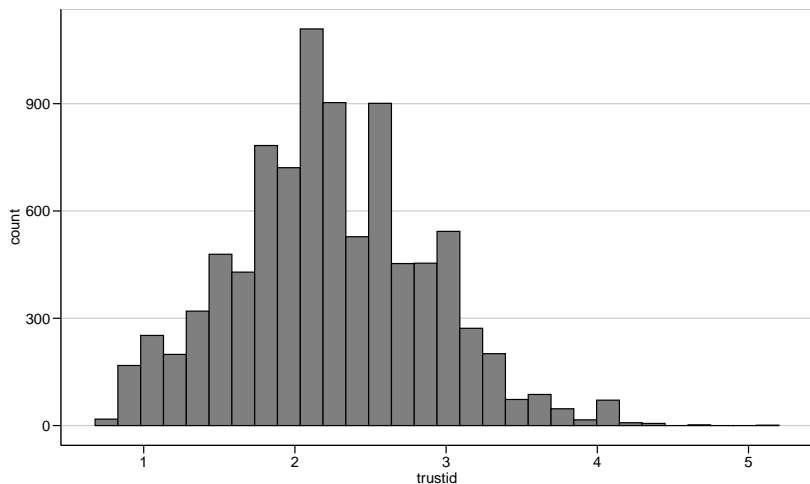


Figure 3: Histogram of Trust Index

Relationship with Donations and Covariates

- ▶ We made a scatter plot b/w individual average donations and trust index
 - ▶ No linear relationship
- ▶ We tested difference in mean of individual average donations b/w among those whose trust index above and below threshold
 - ▶ The difference in mean is statistically significant at 5% level if threshold is $\{2.9, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5\}$.
- ▶ We regressed trust index on covariates, using data in 2018
 - ▶ trust among females < trust among males
 - ▶ the positive correlation between income and trust index
 - ▶ trust index is concave in age
 - ▶ Those having extreme political views have a distrust of politicians rather than those having moderate political views.

Relationship b/w Donations and Trust Index

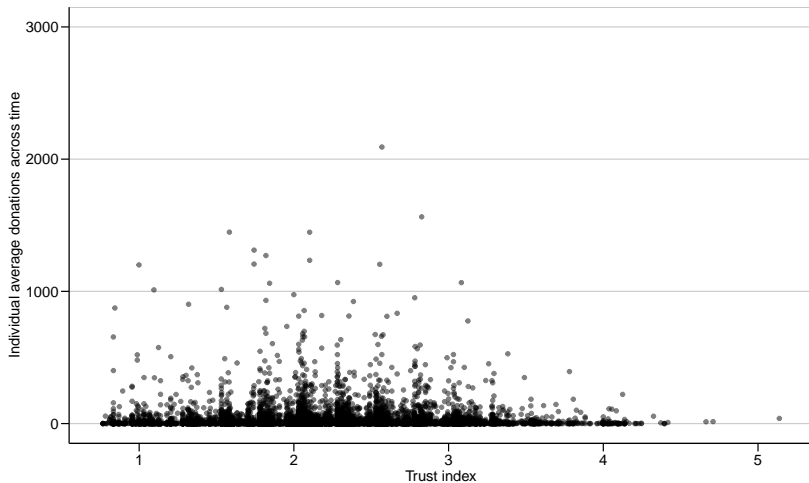


Figure 4: Scatter Plot between Donations and Trust Index

Difference in Mean b/w Two Trust Groups

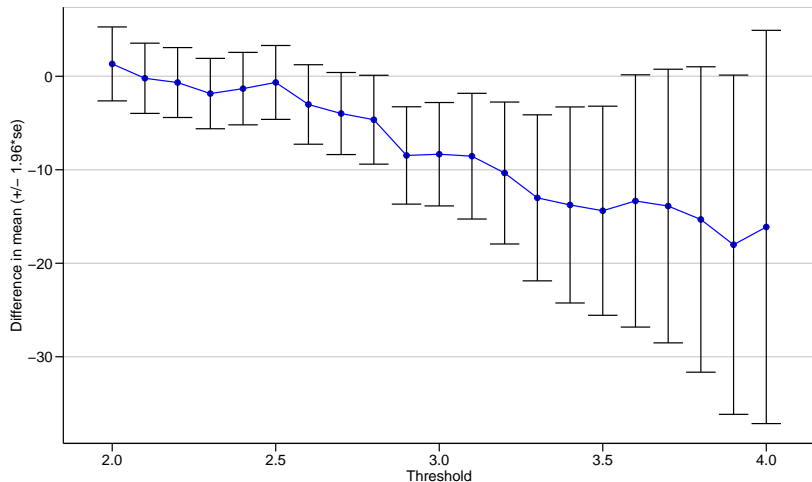


Figure 5: Difference in Mean between Trust Group above and below Threshold

Regression of Trust Index on Covariates

Table 6: Regression of Standardized Trust Index (Year = 2018)

Variables	Coefficients	S.E.
Female	0.036**	(0.015)
Logarithm of income	0.529*	(0.281)
Age	-0.014***	(0.003)
squared age/100	0.014***	(0.002)
High school graduate	0.018	(0.023)
University graduate	0.006	(0.024)
Extreme right wing	-0.143***	(0.054)
Right wing	-0.023	(0.018)
Left wing	-0.050***	(0.018)
Extreme left wing	-0.424***	(0.029)
Obs	7697	

Subgroup Regressions

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

- ▶ Lowest: 0 ~ 20% quantile of trust index
- ▶ Lower: 20 ~ 40% quantile of trust index
- ▶ Neutral: 40 ~ 60% quantile of trust index
- ▶ Higher: 60 ~ 80% quantile of trust index
- ▶ Highest: 80 ~ 100% quantile of trust index

Covariates are the logarithm of income, age, interactions b/w year and education, interactions b/w year and gender, and living are dummy into covariates.

Results of Subgroup Regressions

We could **NOT** find the price effect for respondents whose trust is very low.

Table 7: Subgroup Regressions

	Lowest	Lower	Neutral	Higher	Highest
ln(giving price)	-0.675 (0.558)	-0.460 (0.459)	-1.667*** (0.481)	-1.186** (0.531)	-1.338** (0.552)
Obs	10239	10358	10432	10303	9969

Regression on Interaction Term

To check whether price elasticity is statistically significant different among five trust groups, we estimated the baseline regression model (5) including interaction term between five trust groups and giving price.

$$\begin{aligned}\log(\text{Giving}_{ijt}) = & \alpha_i + \beta_1 \log(\text{Price}_{ijt}) \\ & + \sum_g \beta_g \log(\text{Price}_{ijt}) \cdot \text{TrustGroup}_{ijg} \\ & + \delta X_{ijt} + \lambda_t + \epsilon_{ijt}.\end{aligned}$$

- ▶ TrustGroup_{ijg} : taking 1 if individual i living in j belongs to the trust group g .
- ▶ $g \in \{\text{Lowest, Lower, Higher, Highest}\}$.

Regression Result on Interaction Term

There is statistically significant difference on price elasticity between the lowest group and the neutral group.

Table 8: Heterogenous Price Elasticity

	Coefficients	S.E.
ln(giving price)	-1.646***	(0.393)
X Lowest Trust	1.291**	(0.531)
X Lower Trust	0.833	(0.514)
X Higher Trust	0.275	(0.541)
X Highest Trust	0.372	(0.531)
Obs	51301	

Potential Concerns of Heterogenous Price Elasticity

- ▶ There is one potential concern that the presidential transition affects both donation behavior and political trust.
 - ▶ In May 2017, South Korean 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 Park Geun-hye due to the sinking of MV Sewol (April 2014).
- ▶ To rule out this confounder, we constructed president-specific trust indexes using either in 2015 and 2016 (Park's Trust index) or data in 2017 and 2018 (Moon's Trust index).
 - ▶ We discussed how to use these indexes later.

Relationship b/w President-specific Trust Indexs

- ▶ We made a scatter plot between Park's trust index and Moon's trust index.
 - ▶ Large variation of Moon's trust index among those who have same value of the Park's trust index.
- ▶ We tested the difference in mean between president-specific trust indexs.
 - ▶ The average Park's trust index is lower than the average Moon's trust index, which is statistically significant.

Scatter Plot b/w President-specific Trust Index

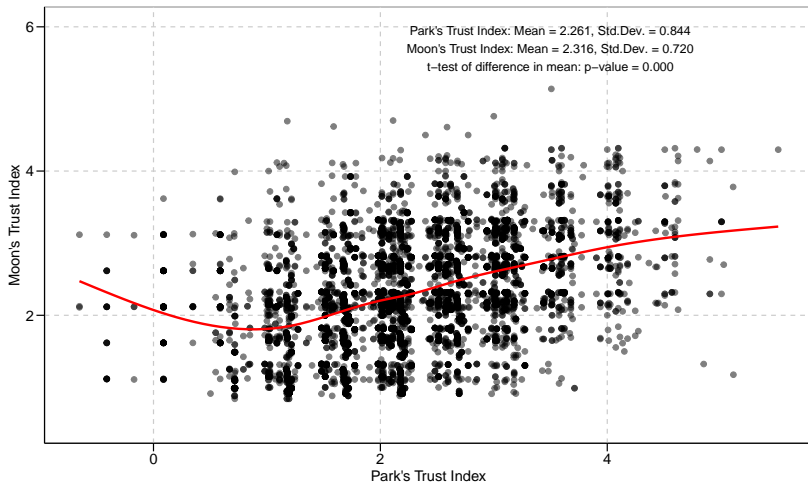


Figure 6: Scatter Plot between Trust Index under Park Geun-hye and Moon Jae-in

Relationship among Three Trust Indexs

- ▶ We made a scatter plot between difference of president-specific trust indexs and the original trust index.
 - ▶ there is large variation of difference of president-specific trust indexs, and there is large variation of the original trust index among those who have similar value of two president-specific trust indexs.
- ▶ We regressed the original trust index on difference of president-specific trust indexs. We restrict units whose absolute value of president-specific trust index difference is less than 2 ($Abs < 2$), 1 ($Abs < 1$), and 0.5 ($Abs < 0.5$).
 - ▶ the positive correlations between difference of president-specific trust indexs and the original one. However, this positive correlation is statistically insignificant if we use units whose president-specific trust indexs have similar values.

Scatter Plot b/w Difference of Separated Trust Indexs and Original One

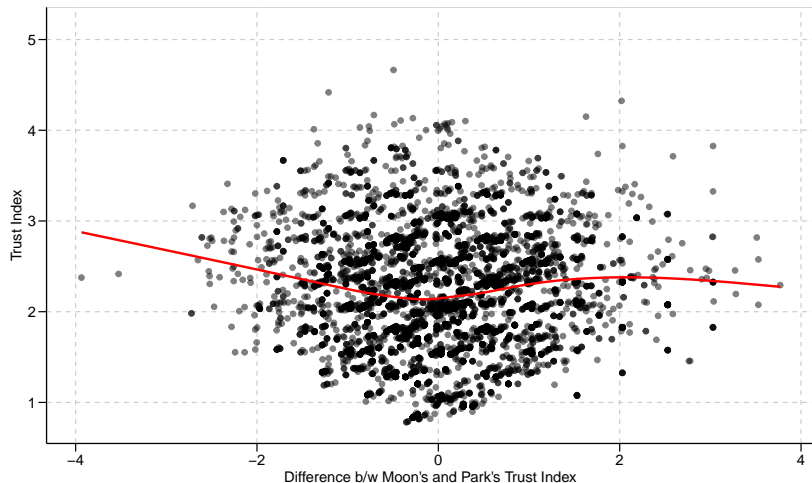


Figure 7: Scatter Plot between Difference of President-specific Trust Indexs and Original One

Result of Regressions on Difference b/w President-specific Trust

Table 9: Regressions of Trust Index on President-specific Trust Index

	Full	Abs < 2	Abs < 1	Abs < 0.5
Moon's trust - Park's trust	0.020** (0.008)	0.026*** (0.010)	0.031* (0.016)	0.035 (0.038)
Obs	7314	7080	5666	3528
Adjusted R-sq	0.001	0.001	0.000	-0.000

Robustness Check of Heterogenous Price Elasticity

1. Using data in 2013 and 2014, we regressed the interaction model again
 - ▶ The president was Park Geun-hye in both 2013 and 2014. Thus, we can exclude the effect of presidential transition on donation behavior.
2. Using the park's trust index instead, we regressed the interaction model with data in 2013 and 2014.
 - ▶ Since the trust index represents the trust for politicians under the president Park (but scandalous period), we can rule out the effect of presidential transition on both donations and trust.
3. Restricting to units absolute value of president-specific trust index difference is less than 1 or 0.5, we regressed the interaction model again (year > 2011)
 - ▶ Last method rules out the effect of presidential transition on political trust because the original trust index is not affected by presidential transition.

Result of Robustness Check

Table 10: Robustness Check of Heterogenous Price Elasticity

Year	2013 and 2014		After 2012	
Trust index	Original	Park	Original(Abs<1)	Original(Abs<0.5)
	(1)	(2)	(3)	(4)
ln(giving price)	-2.701*** (0.575)	-1.330** (0.570)	-1.477*** (0.444)	-1.223** (0.606)
X Lowest Trust	1.668** (0.781)	0.012 (0.798)	1.014* (0.600)	0.669 (0.784)
X Lower Trust	1.058 (0.729)	-0.112 (0.718)	0.514 (0.600)	0.161 (0.791)
X Higher Trust	1.727** (0.738)	-0.773 (0.765)	-0.068 (0.634)	-0.383 (0.834)
X Highest Trust	1.557* (0.800)	-0.092 (0.770)	-0.099 (0.638)	-0.834 (0.880)
Obs	13786	13438	35909	22370

Conclusions

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