Charitable Giving, Tax Reform, and Political Trust

Hiroki Kato[1] Tsuyoshi Goto[2] Yong-Rok Kim[3]

[1] Osaka University

[2] Chiba University

[3] Kobe University

2021/02/01

Introduction

Charitable Giving and Taxation

In many countries, governments set a tax relief for charitable giving. This is because, if subsidizing charitable giving induces a large increase in donations, it is desirable.

To evaluate the effect of tax relief, it is needed to know the elasticity of charitable donations with respect to their tax price.

Charitable Giving and Taxation

In addition to the tax price charitable donations, the donations may be affected by people's perception towards the government.

This is because the works and missions of private charity often mirror or overlap with one of governments, and the charity is not needed if the government adequately satisfies the needs of society.

Thus, the different perception towards the government may make the different behavior for charitable giving.

We investigate the relation between tax price elasticity of charitable donations and the different perception towards the government using the South Korean dataset.

South Korean tax reform

We can utilize the effect of 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 marginal tax rate, which increases with gross income.

In addition, the dataset contains the information about perception towards the government.

Related Literature

This study mainly relates to the two strands of studies.

1. Research about tax price elasticity of charitable donations
2. Research about perception towards the government and donation/tax payment.

Research about tax price elasticity of charitable donations

Papers in this strand examines the price and income elasticity of charitable donations using the tax deduction applied for donation. The estimated price elasticities vary, but the typical one is said as -1 (Andreoni and Payne, 2013).

- Auten et al.(2002): -0.79∼-1.26 (the U.S.)
- Fack and Landais(2010): -0.15∼-0.57 (France)
- Bakija and Heim (2011): -0.61∼-1.1 (the U.S.)
- Duquette (2016): -2.15∼-5.01 (the U.S.)
- Almunia et al.(2020): -0.24∼–1.5 (the U.K.)

The study in non-Western country, where the culture of donation may be different, is few. Thus, we firstly examine the elasticity of giving in Korea.

Research about perception towards the government and donation/tax payment.

Experimental studies show that the giving behavior may be affected by perception towards the government.

- Li et al.(2011) suggest that governmental organizations collect less donation than private charities though they have the same mission and work.
- Sheremeta and Uler(2020) show that individuals provide public good reacting the wasteful spending of government.

This may be because people with distrust in government think that

1. the direct donation is more efficient than public service provision or
2. people can directly allocate and control their funds by donation, unlike public service provision.

Thus, people having the different trust in the government would have different elasticities of giving.

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

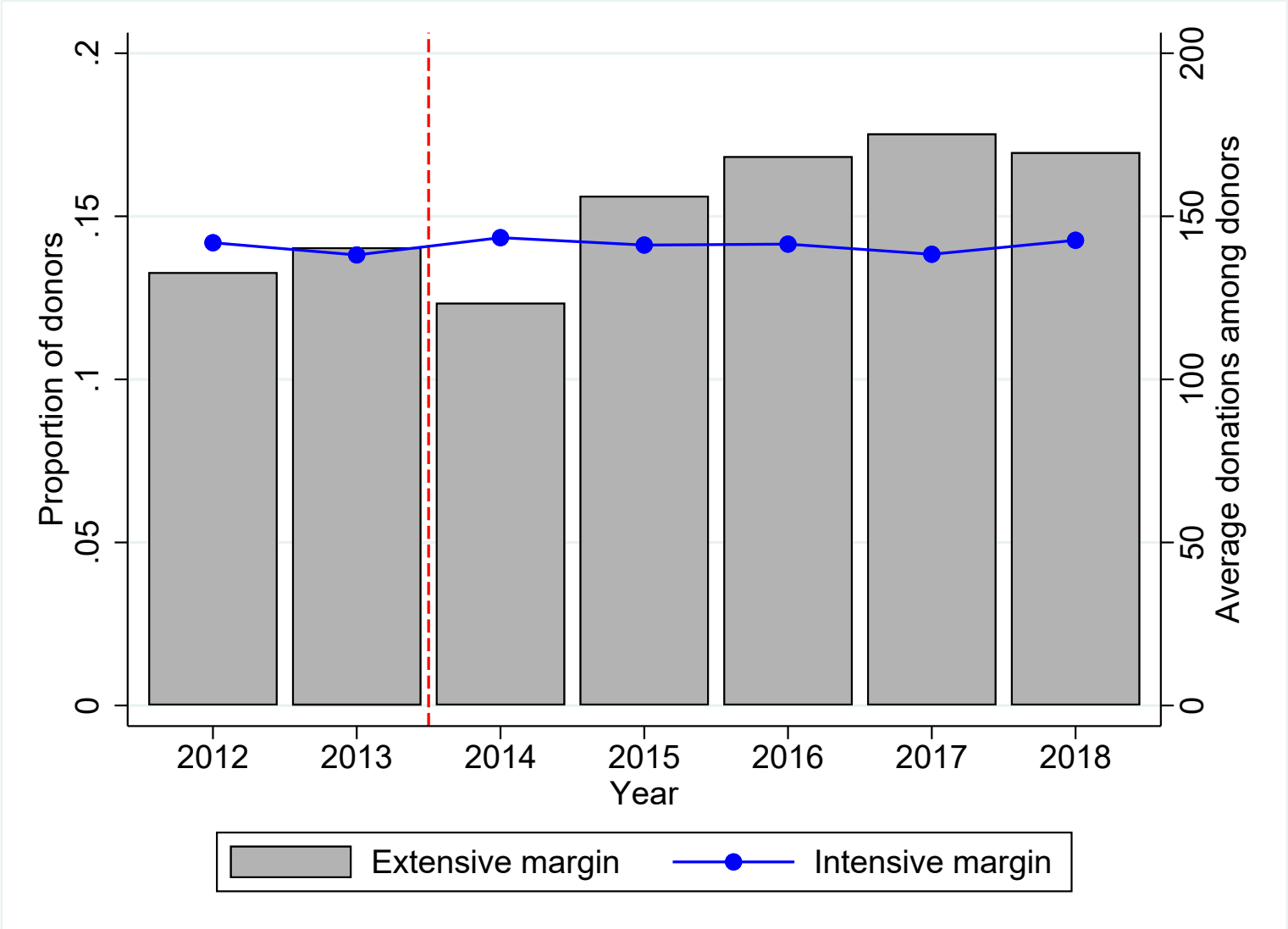


Figure 1: Proportion of Donors and Average Donations among Donors

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

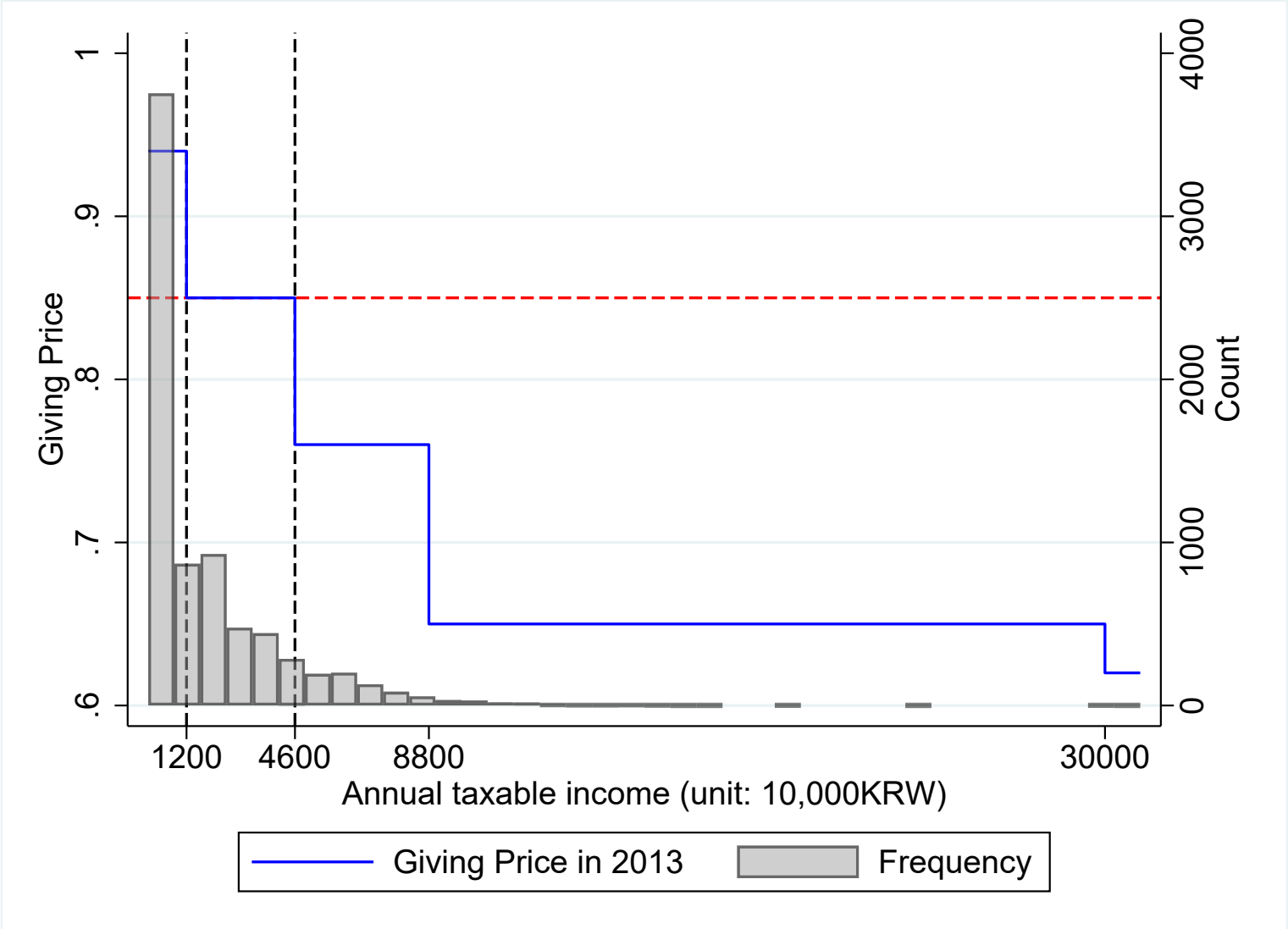


Figure 2: Income Distribution and Giving Price in 2013

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.

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***	-1.071***	-1.229***	-1.059***	-1.062***
	(0.201)	(0.201)	(0.227)	(0.226)	(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
N	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 insturment.
   - 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 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 $k = 1, 2, 3, 4$.

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)	-1.279***	-1.155***	-1.150***	-0.962***
	(0.478)	(0.414)	(0.369)	(0.340)
F-stat of IV	10315.94	11506.64	11569.61	9651.75
N	51548	49217	46399	43301

Result of Robustness Check 2

We obtained **stonger** price effect than baseline (1% price increase leads to about $1.2 \sim 1.6\%$ 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***	-1.535***	-1.683***	-1.151***	-1.259***
	(0.327)	(0.360)	(0.378)	(0.385)	(0.400)
F-stat of IV		7420.10	4490.74	5034.58	4990.94
N	15134	13727	12902	12420	11676

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

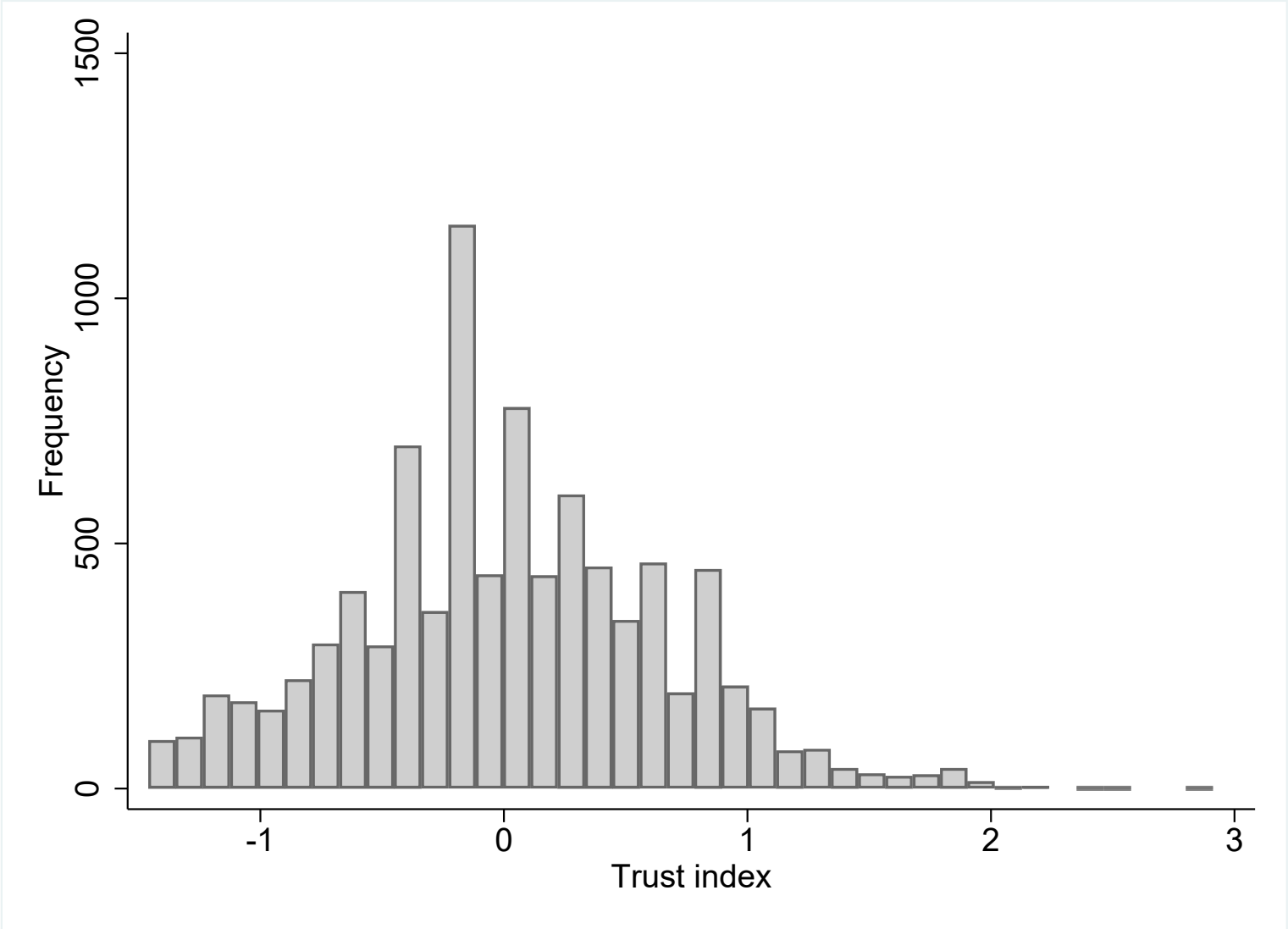


Figure 3: Histogram of Trust Index

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 siginificant at 5% level if threshold is $\{0.6, 0.7, 0.8, 0.9, 1.0, 1.1, 1.2, 1.3, 1.4\}$.
- 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

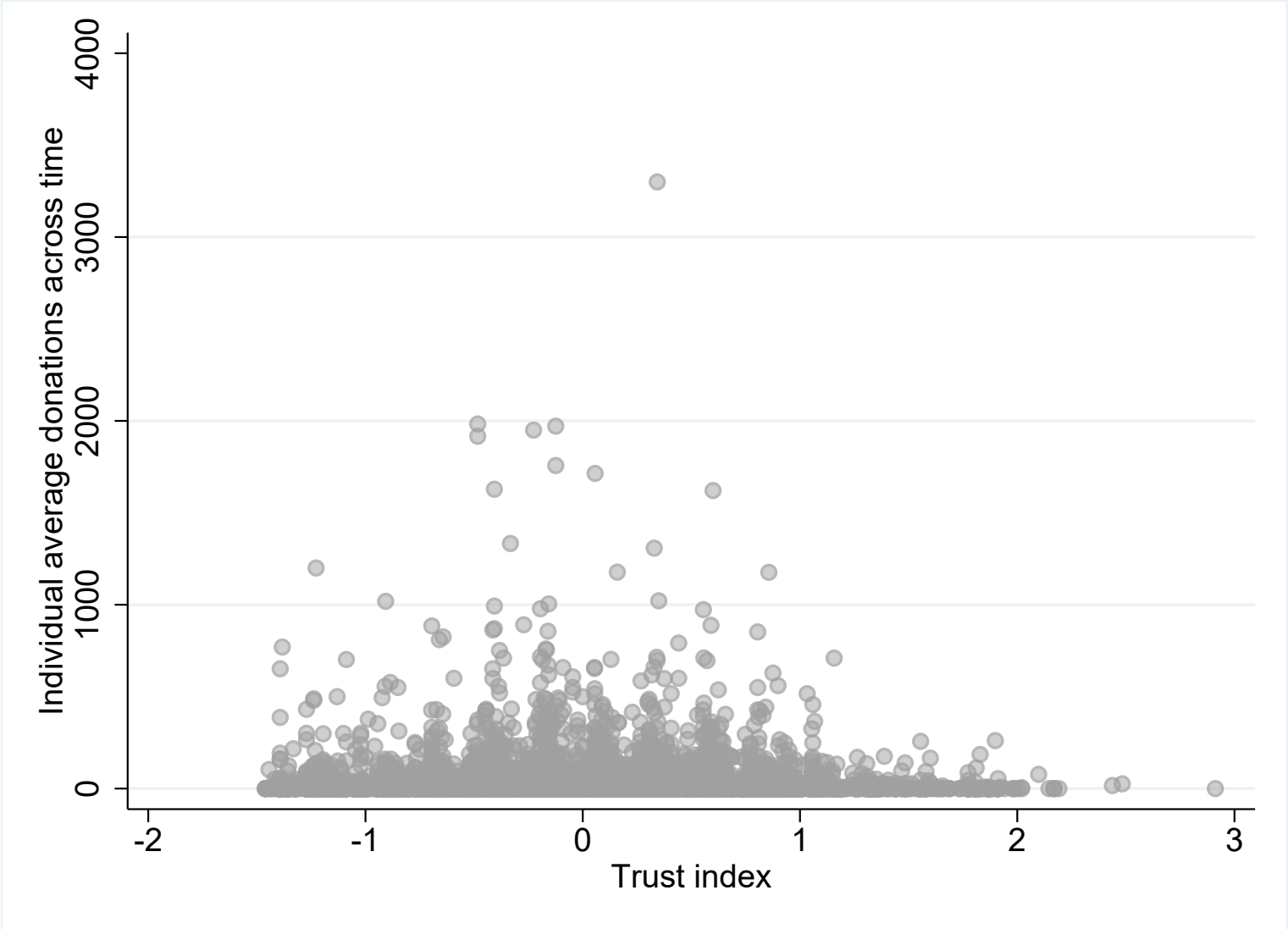


Figure 4: Scatter Plot between Donations and Trust Index

Difference in Mean b/w Two Trust Groups

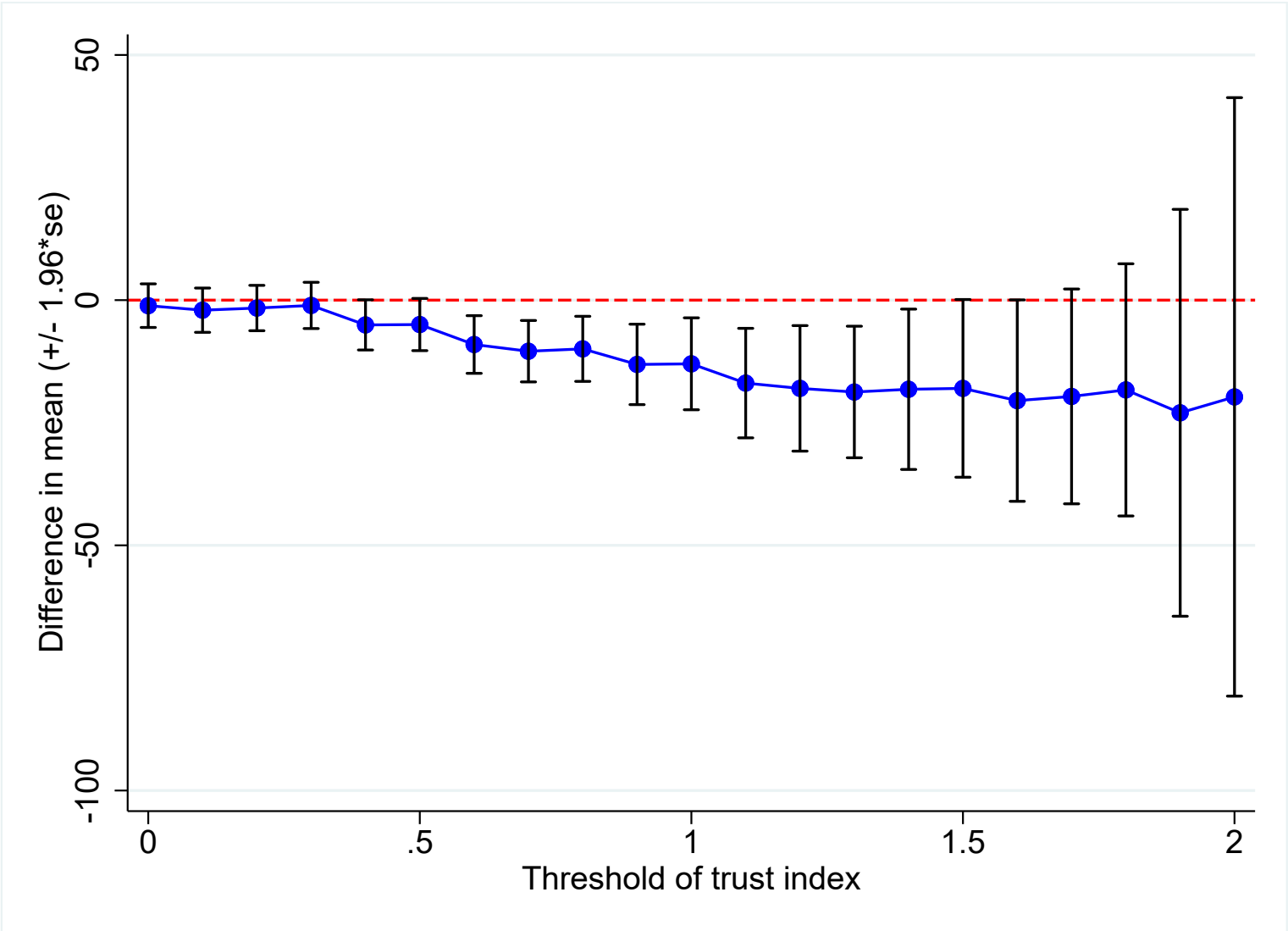


Figure 5: Difference in Mean between Trust Group above and below Threshold

Regression of Trust Index on Covariates

Table 6: Regression of Standarized 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)
N	7697	

Subgroup Regressions

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.

- Lowest: 0 $\sim$ 20% quantile of trust index
- Lower: 20 $\sim$ 40% quantile of trust index
- Neutral: 40 $\sim$ 60% quantile of trust index
- Higher: 60 $\sim$ 80% quantile of trust index
- Highest: 80 $\sim$ 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 cound **NOT** find the price effect for respondents whose trust is very low.

Table 7: Subgroup Regressions

	Lowest	Lower	Neutral	Higher	Highest
ln(giving price)	-0.673	-0.452	-1.707***	-1.130**	-1.397**
	(0.557)	(0.462)	(0.479)	(0.524)	(0.563)
N	10250	10532	10286	10558	9680

Regression on Interaction Term

To check whether price elasticity is statistically siginificant different among five trust groups, we estimated the baseline regression model (5) including interation 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.
- $g \in \{\text{Lowest}, \text{Lower}, \text{Higher}, \text{Highest}\}$.

Regression Result on Interation Term

There is statistically siginificant difference on price elasticity between the lowest group and the nuetral group.

Table 8: Heterogenous Price Elasticity

	Coefficients	S.E.
ln(giving price)	-1.702***	(0.388)
X Lowest	1.345**	(0.527)
X Lower	0.917*	(0.513)
X Higher	0.403	(0.533)
X Highest	0.350	(0.534)
N	51306	

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 shinking of MV Sewol (April 2014).
- To rule out this confounder, we constructed president-specific trust indexs 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 indexs 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 whether the average individual difference b/w president-specific trust indexs is statistically different from zero.
  - We cannot reject the null hypothesis.

Scatter Plot b/w President-specific Trust Indexs

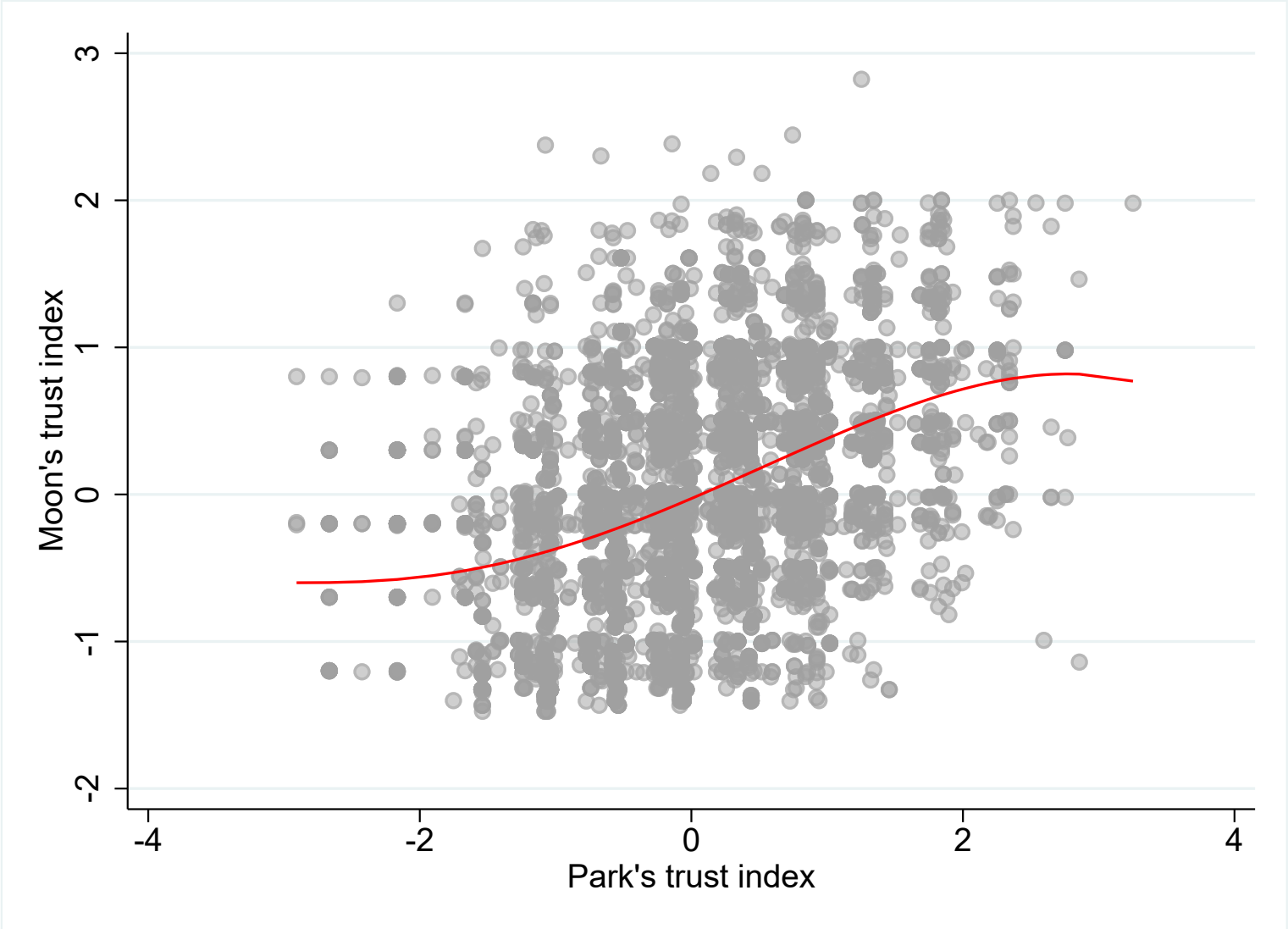


Figure 6: Scatter Plot between Trust Index under Park Geun-hye and Moon Jae-in

Result of Pair-wise t-test

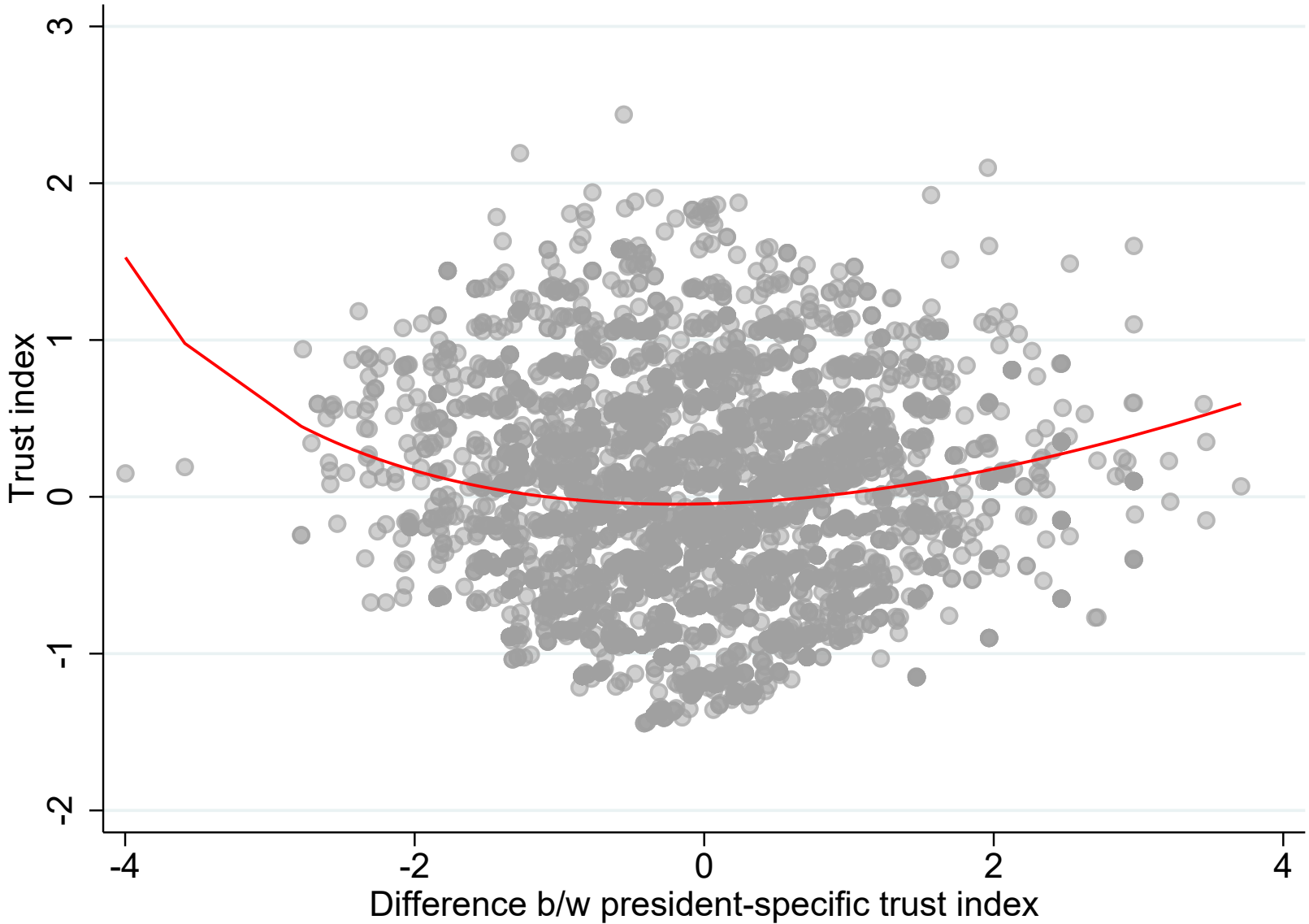
Table 9: Pair-wise T-test

	Moon's trust	Park's trust	Difference
Average	-0.009	-0.001	-0.008
	(0.716)	(0.827)	[0.446]

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 aboslute 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 insignigicant if we use units whose president-specific trust indexs have similar values.

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



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

Table 10: 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**	0.024***	0.033**	0.066*
	(0.008)	(0.009)	(0.016)	(0.038)
Adjusted R-sq	0.001	0.001	0.001	0.001
N	7314	7128	5687	3467

Robustness Check of Heterogenous Price Elasticity

1. Using data in 2013 and 2014, we estimated 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 estimated 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.

Result of Robustness Check

Table 11: Robustness Check of Heterogenous Price Elasticity

Year	2013 and 2014	
Trust index	Original	Park
	(1)	(2)
ln(giving price)	-2.724***	-1.702***
	(0.580)	(0.548)
X Lowest Trust	1.689**	0.458
	(0.784)	(0.771)
X Lower Trust	1.081	0.445
	(0.728)	(0.707)
X Higher Trust	1.787**	0.050
	(0.735)	(0.741)
X Highest Trust	1.533*	-0.188
	(0.813)	(0.779)
N	13788	13440

Tax-welfare Balance and Price Elasticity

Tax-welfare Balance

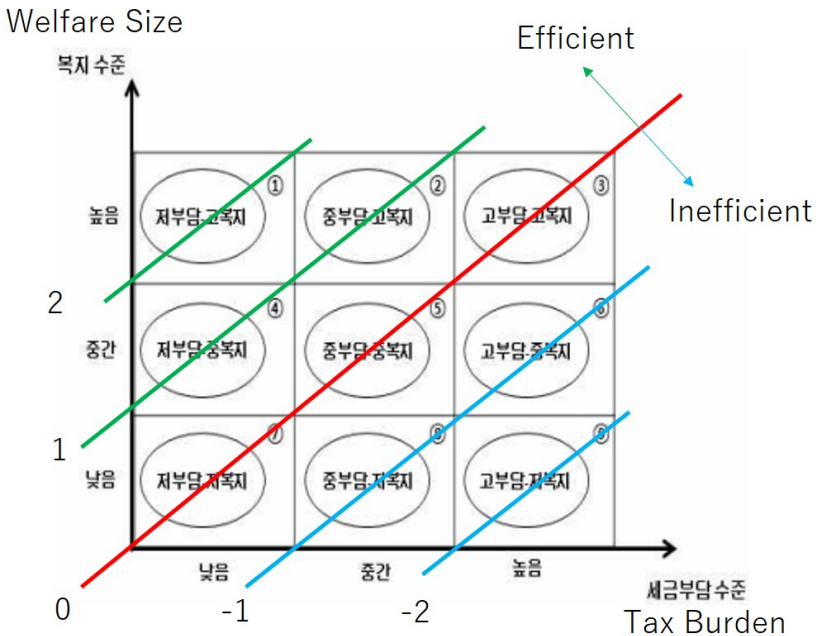
From the 2015 survey, NaSTaB asks the current and ideal balance between tax burden and welfare size.

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 Tax-welfare Balance 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 Trust Index

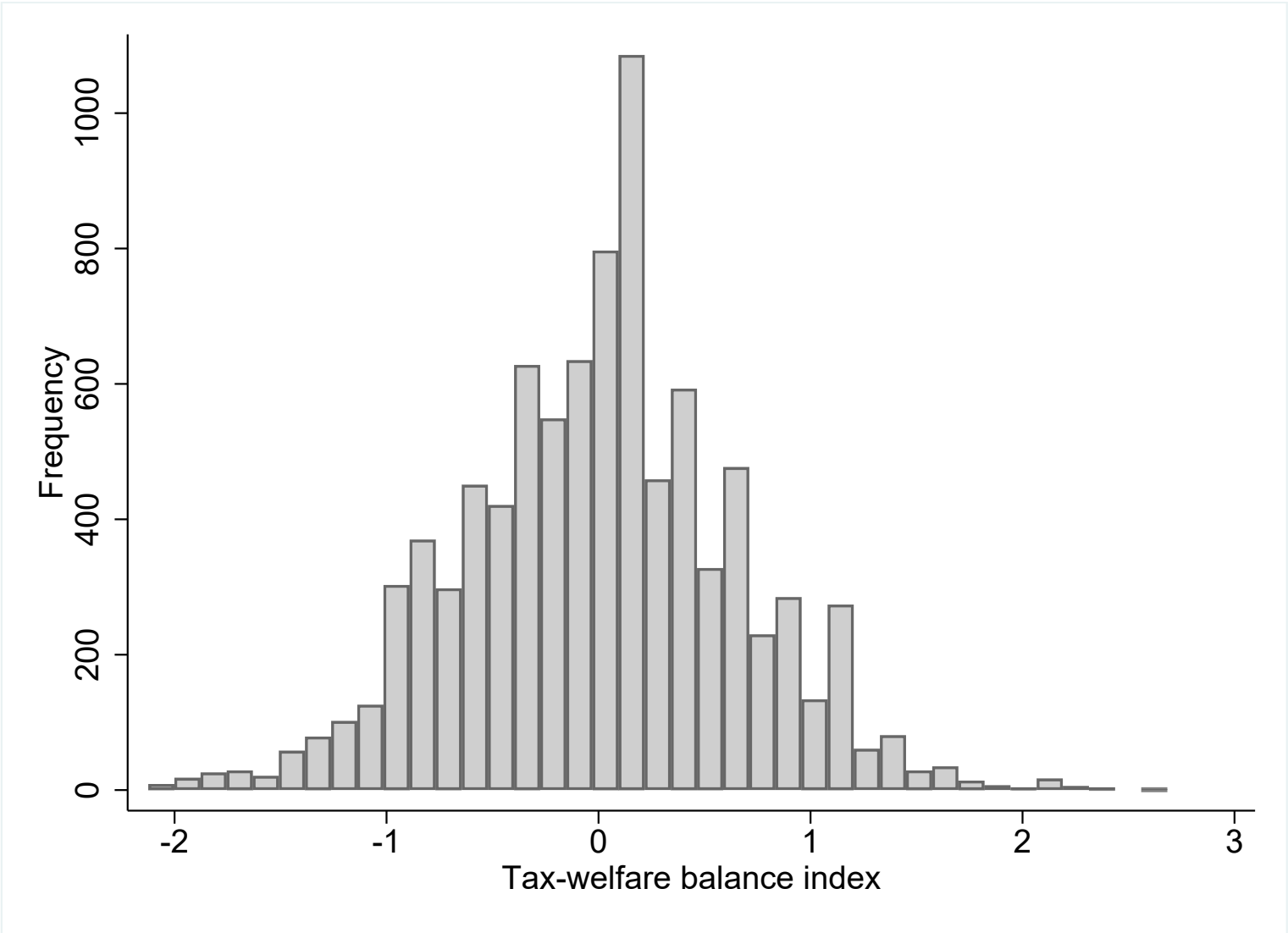


Figure 8: Histogram of Tax-Welfare Balance Index

Relationship b/w Donations and Balance Index

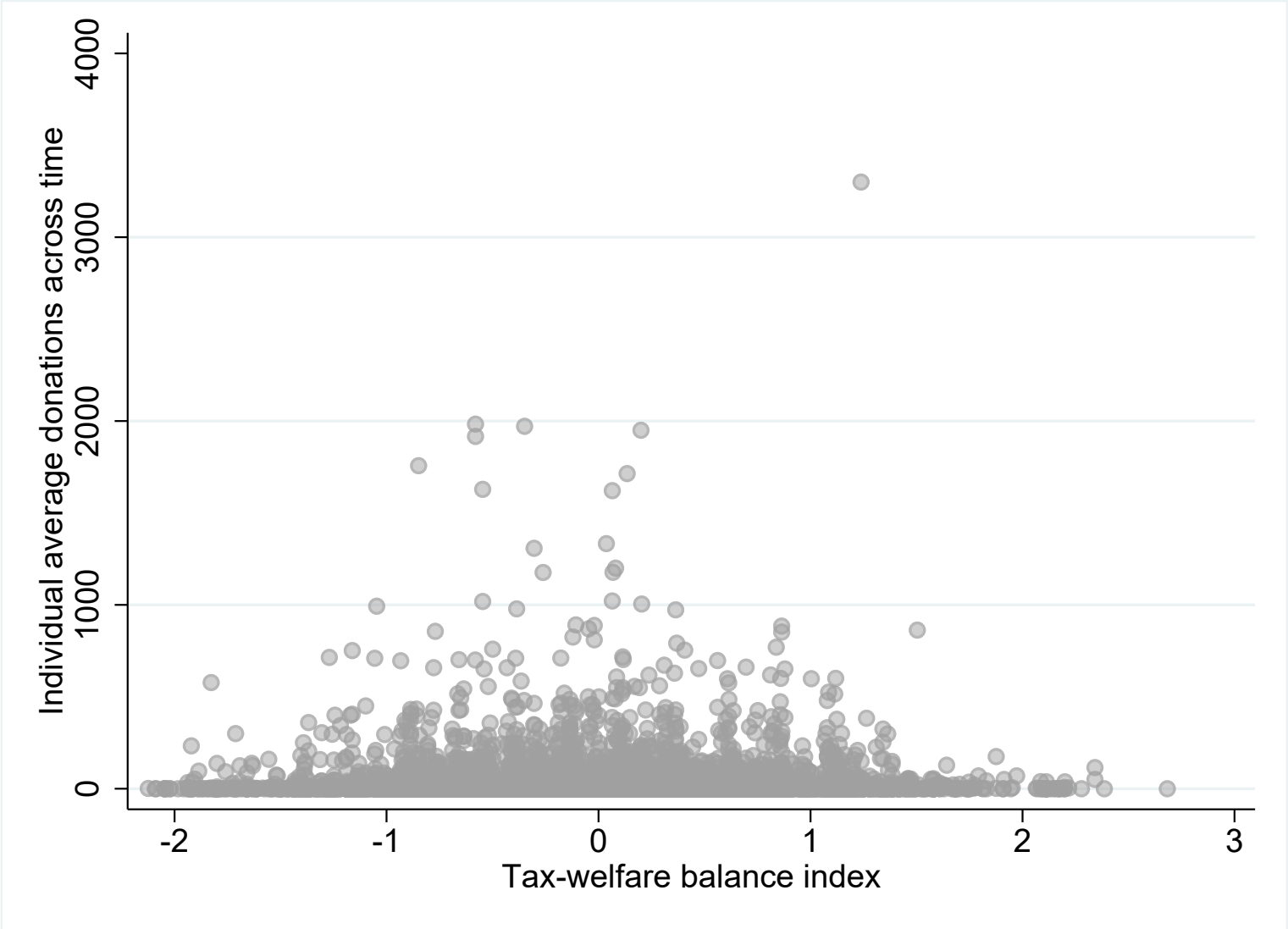


Figure 9: Scatter Plot between Donations and Tax-Welfare Balance Index

Difference in Mean b/w Two Trust Groups

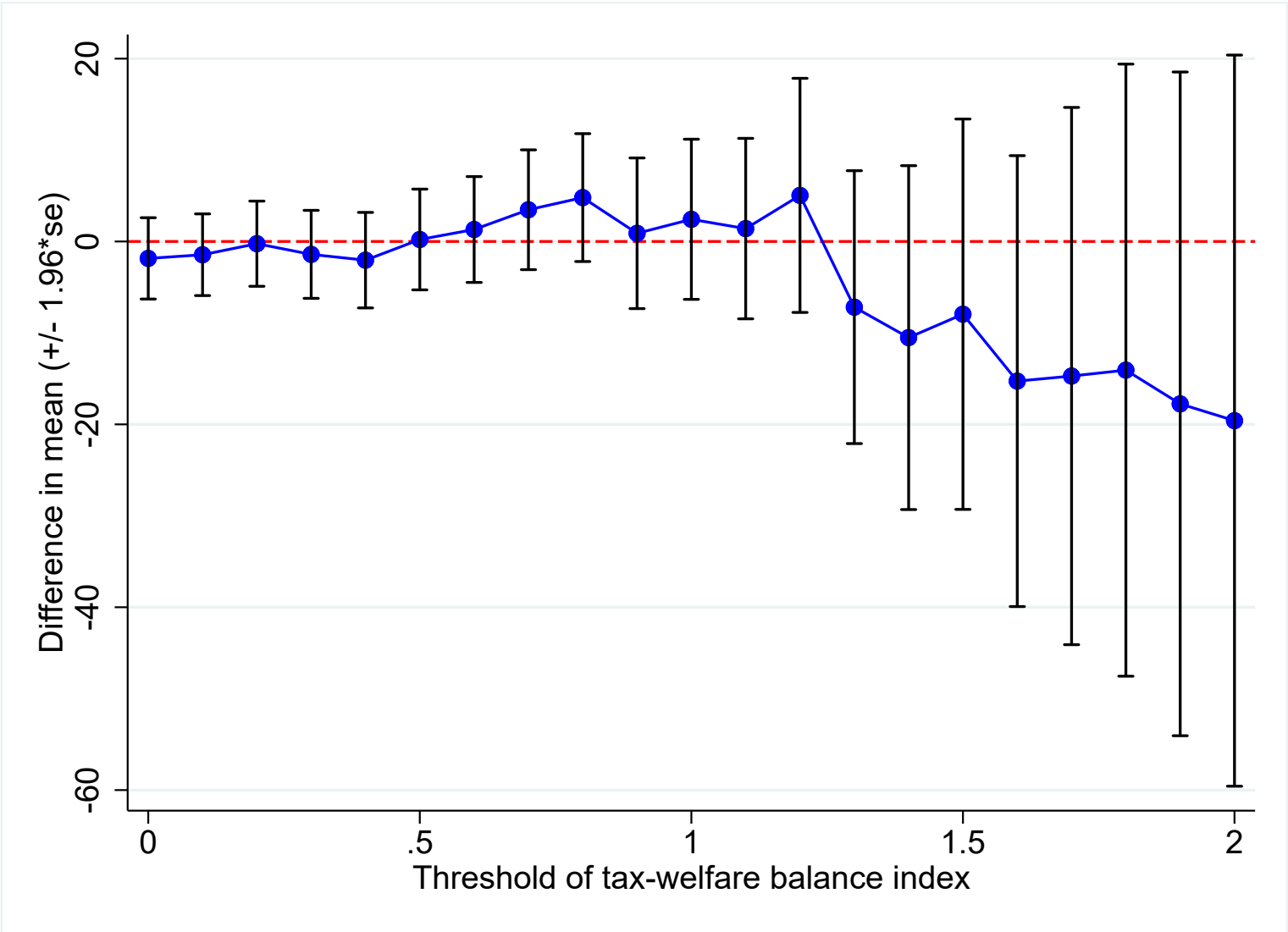


Figure 10: Difference in Mean between Group above and below Threshold

Regression of Tax Balance Index on Covariates

Table 12: Regression of Taw-Welfare Balance Index (Year = 2018)

Variables	Coefficients	S.E.
Female	0.011	(0.015)
Logarithm of income	-1.821***	(0.285)
Age	-0.005**	(0.003)
Squared age/100	0.009***	(0.002)
High school graduate	-0.054**	(0.023)
University graduate	-0.076***	(0.025)
Extreme right wing	0.056	(0.055)
Right wing	0.001	(0.018)
Left wing	-0.010	(0.018)
Extreme left wing	0.015	(0.029)
N	7697	

Subgroup Regressions

Table 13: Subgroup Regressions

	S inefficient	Inefficient	Balanced	Efficient	S efficient
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

Regression on Interaction Term

Table 14: Heterogenous Price Elasticity among Tax-Welfare Balance

	Coefficients	S.E.
ln(giving price)	-1.731***	(0.418)
X Strong inefficient	0.781	(0.556)
X Inefficient	0.727	(0.539)
X Efficient	0.486	(0.529)
X Strong Efficient	1.183**	(0.511)
N	51306	

Scatter Plot b/w President-specific Balance Indexs

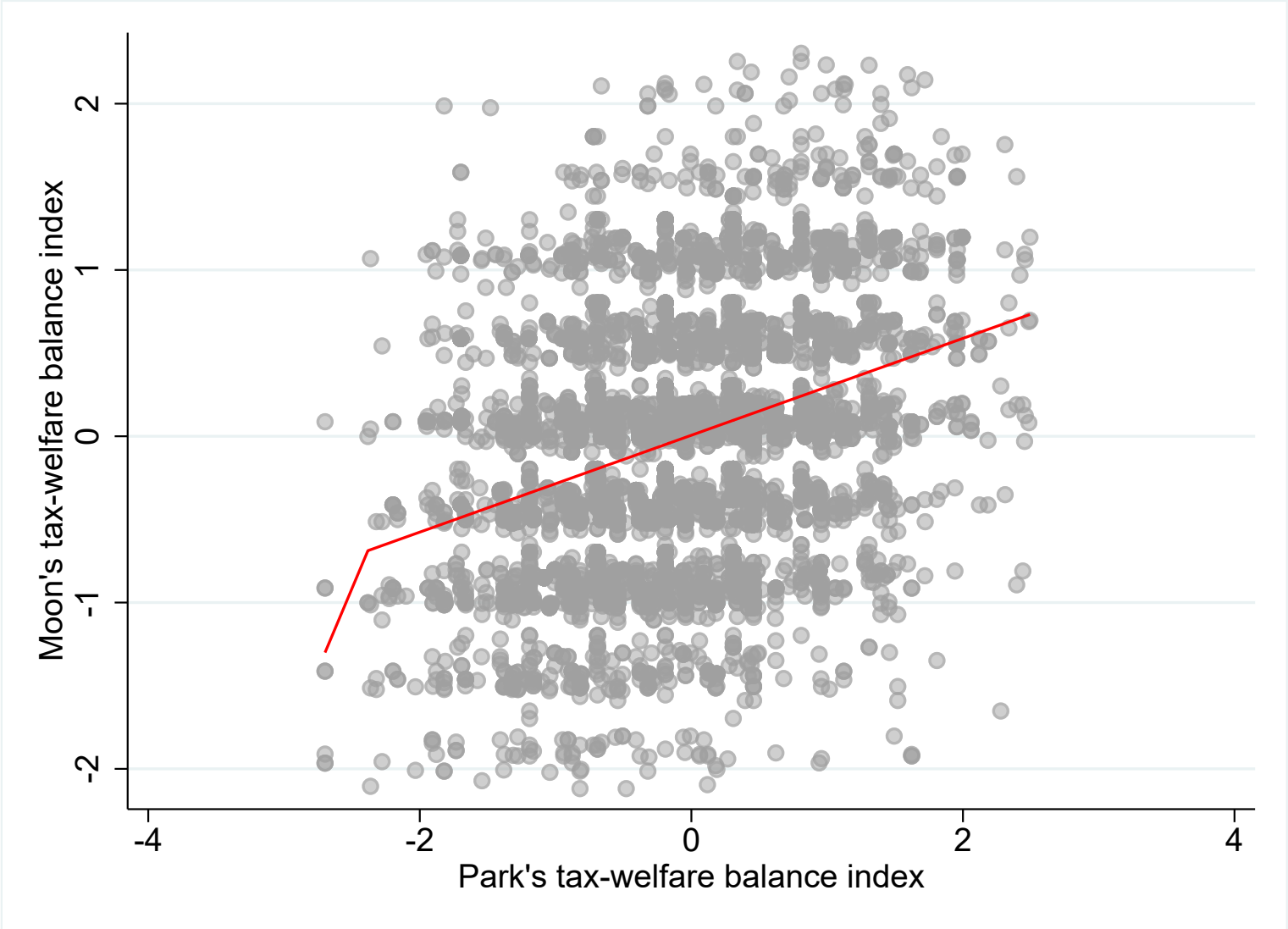


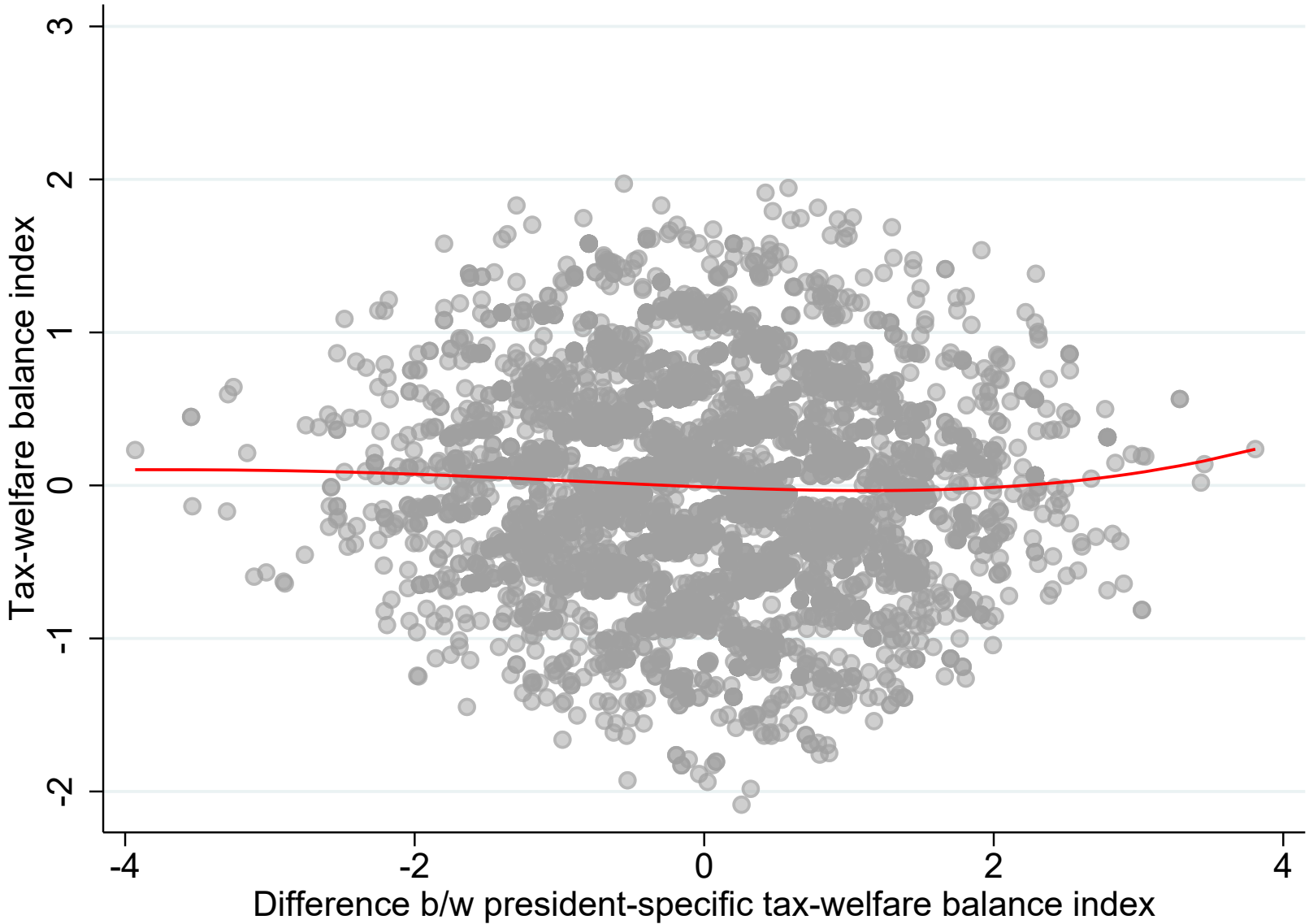
Figure 11: Scatter Plot between Balance Index under Park Geun-hye and Moon Jae-in

Result of Pair-wise t-test

Table 15: Pair-wise T-test

	Moon's balance index	Park's balance index	Difference
Average	0.004 (0.719)	-0.006 (0.824)	0.010 [0.353]

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



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

Table 16: Regressions of Balance Index on President-specific Balance Index

	Full	Abs < 2	Abs < 1	Abs < 0.5
Moon's index - Park's index	-0.024***	-0.034***	-0.055***	-0.058
	(0.008)	(0.009)	(0.016)	(0.039)
Adjusted R-sq	0.001	0.002	0.002	0.000
N	7314	7101	5515	3384

Robustness Check of Heterogenous Price Elasticity

Table 17: Robustness Check of Heterogenous Price Elasticity

Year	2013 and 2014		After 2012
Tax-welfare balance index	Original	Park	Original (Abs<0.5)
	(1)	(2)	(3)
ln(giving price)	-2.280***	-0.987*	-1.675***
	(0.681)	(0.560)	(0.614)
X Strong inefficient	1.254	0.274	1.016
	(0.856)	(0.785)	(0.825)
X Inefficient	0.885	-1.382*	0.333
	(0.800)	(0.740)	(0.852)
X Efficient	0.590	-0.972	-0.155
	(0.799)	(0.750)	(0.776)
X Strong efficient	0.776	-0.577	1.842**
	(0.791)	(0.731)	(0.790)
N	13788	13440	21528

Conclusions

Conclusions