# 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

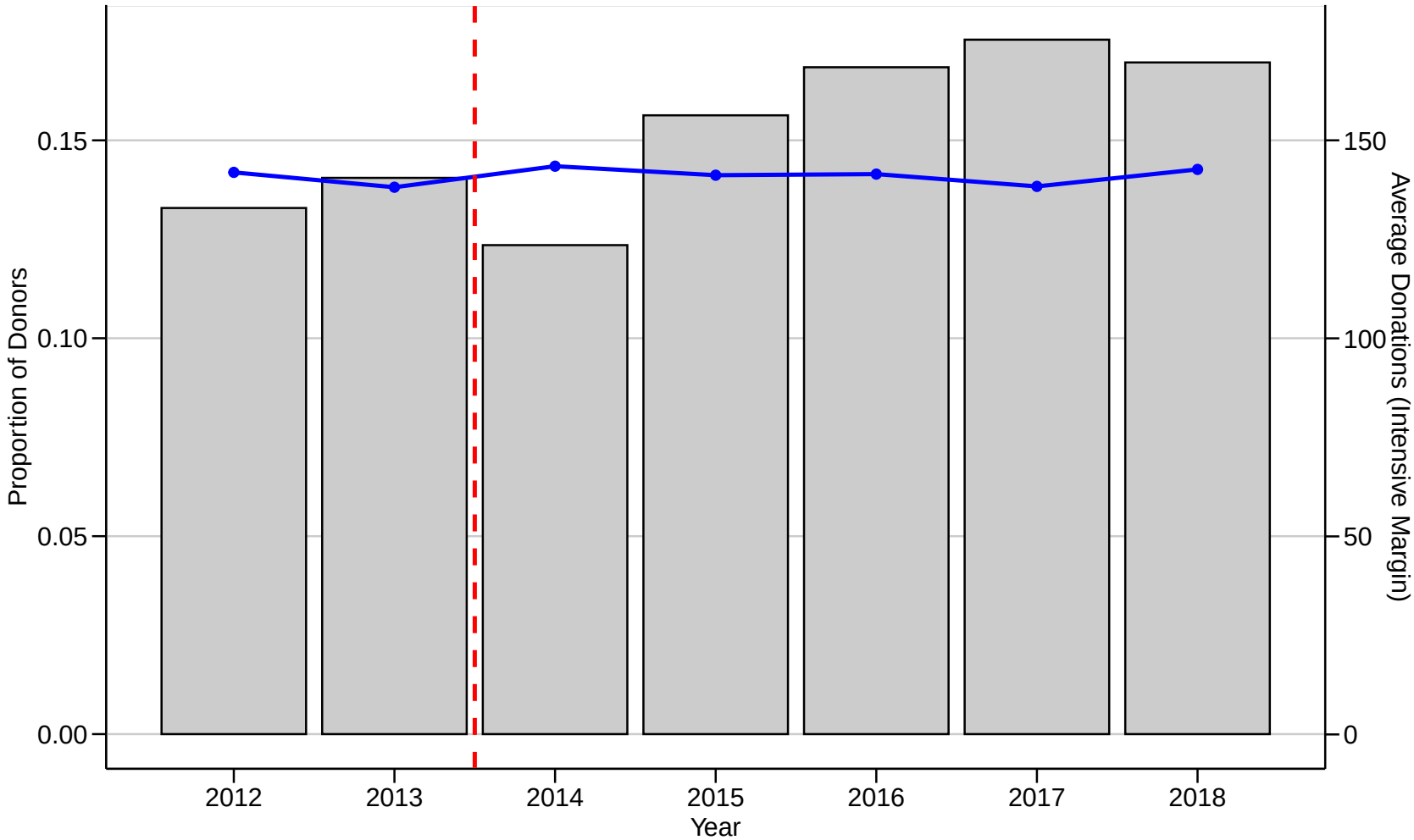


Figure 1: Proportion of Donors (bar chart) and Average Donations among Donors (blue line)

# 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

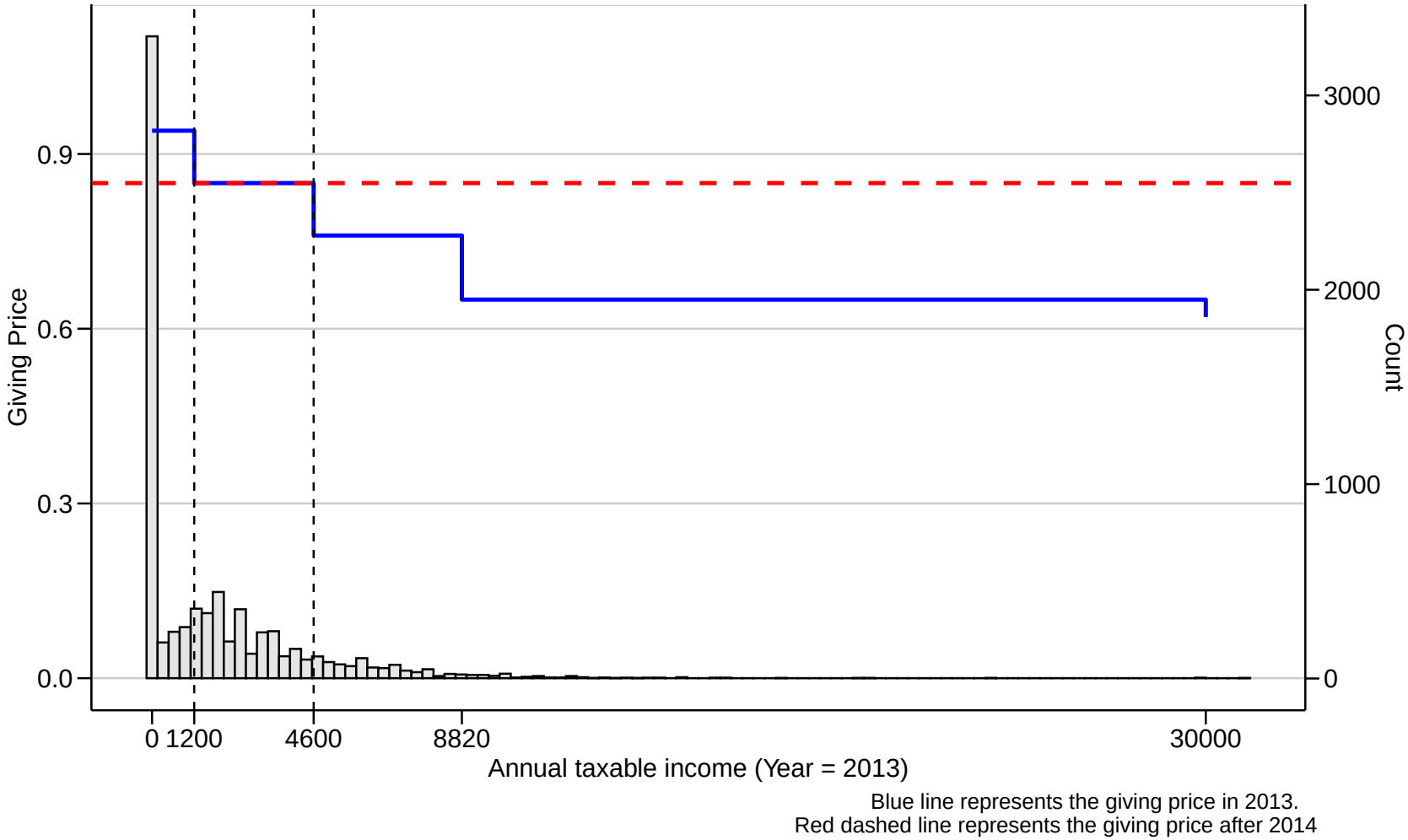


Figure 2: Income Distribution and Giving Price

# 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 $t$.
- $\beta_1$ represents the price elasticity of giving.
- $\alpha_i$ and $\lambda_t$ 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 |
| 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 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) | -1.160** | -1.088*** | -1.138*** | -0.941*** |
| | (0.473) | (0.411) | (0.368) | (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 **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*** | -1.497*** | -1.628*** | -1.207*** | -1.331*** |
| | (0.327) | (0.355) | (0.375) | (0.381) | (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 politicans is time-varying variable because it depends on governments' policies. We make time-invarying trust index using the fixed effect model.

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

- $\text{Trust}_{ijt}$: 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

# Histrogram of Trust Index

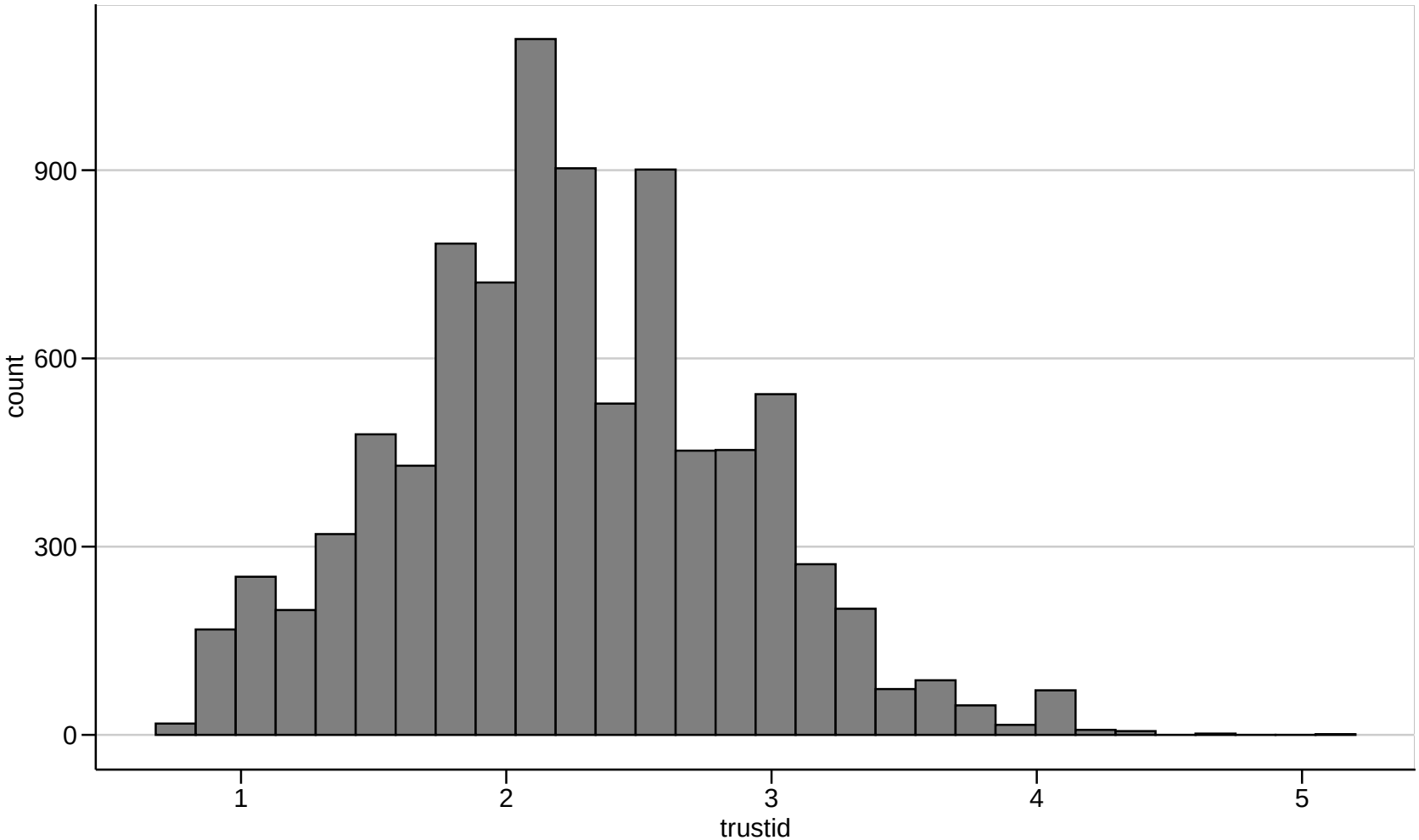


Figure 3: Histogram of Trust Index

# 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 $\{2.9, 3.0, 3.1, 3.2, 3.3, 3.4, 3.5\}$.
- 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

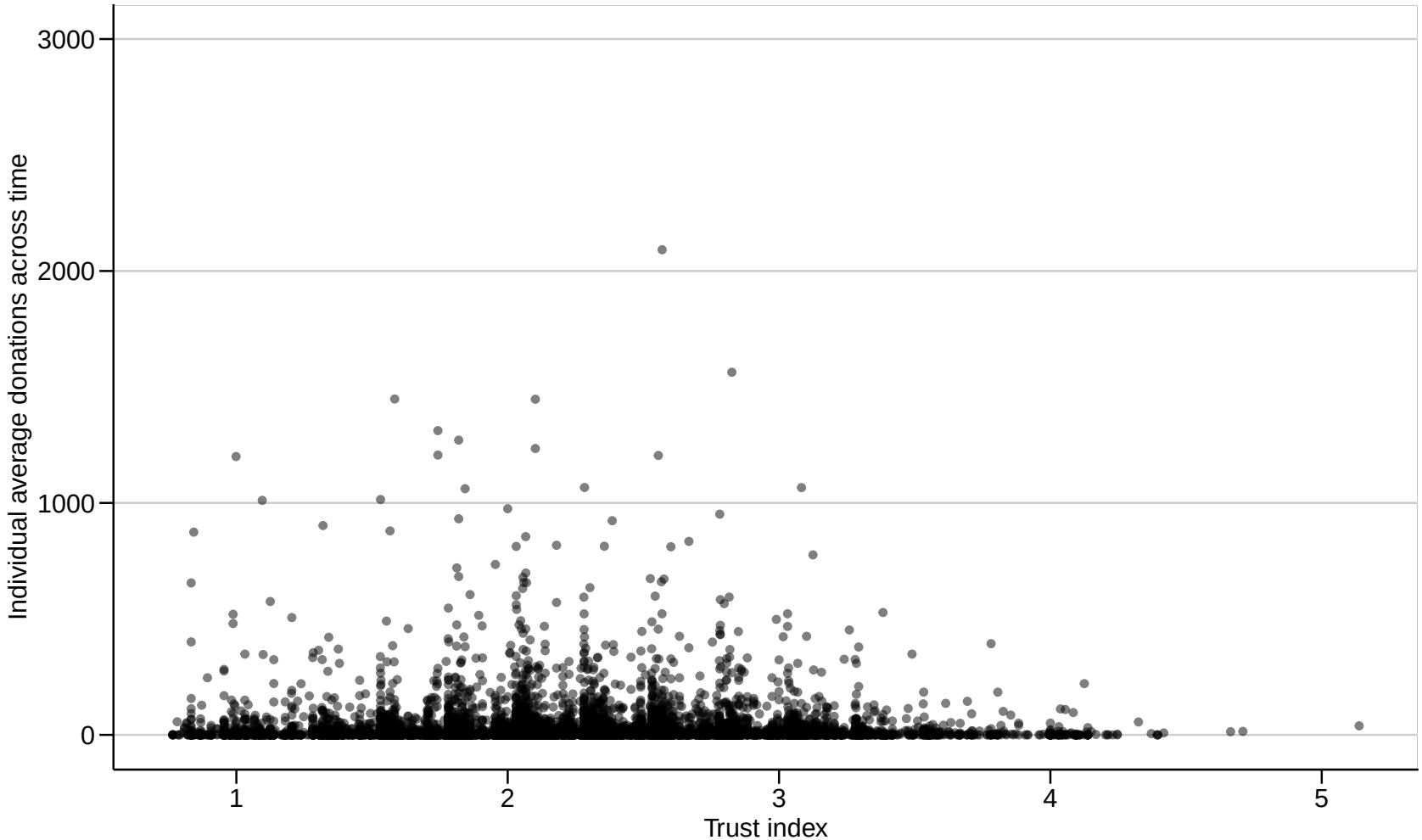


Figure 4: Scatter Plot between Donations and Trust Index

# Difference in Mean b/w Two Trust Groups

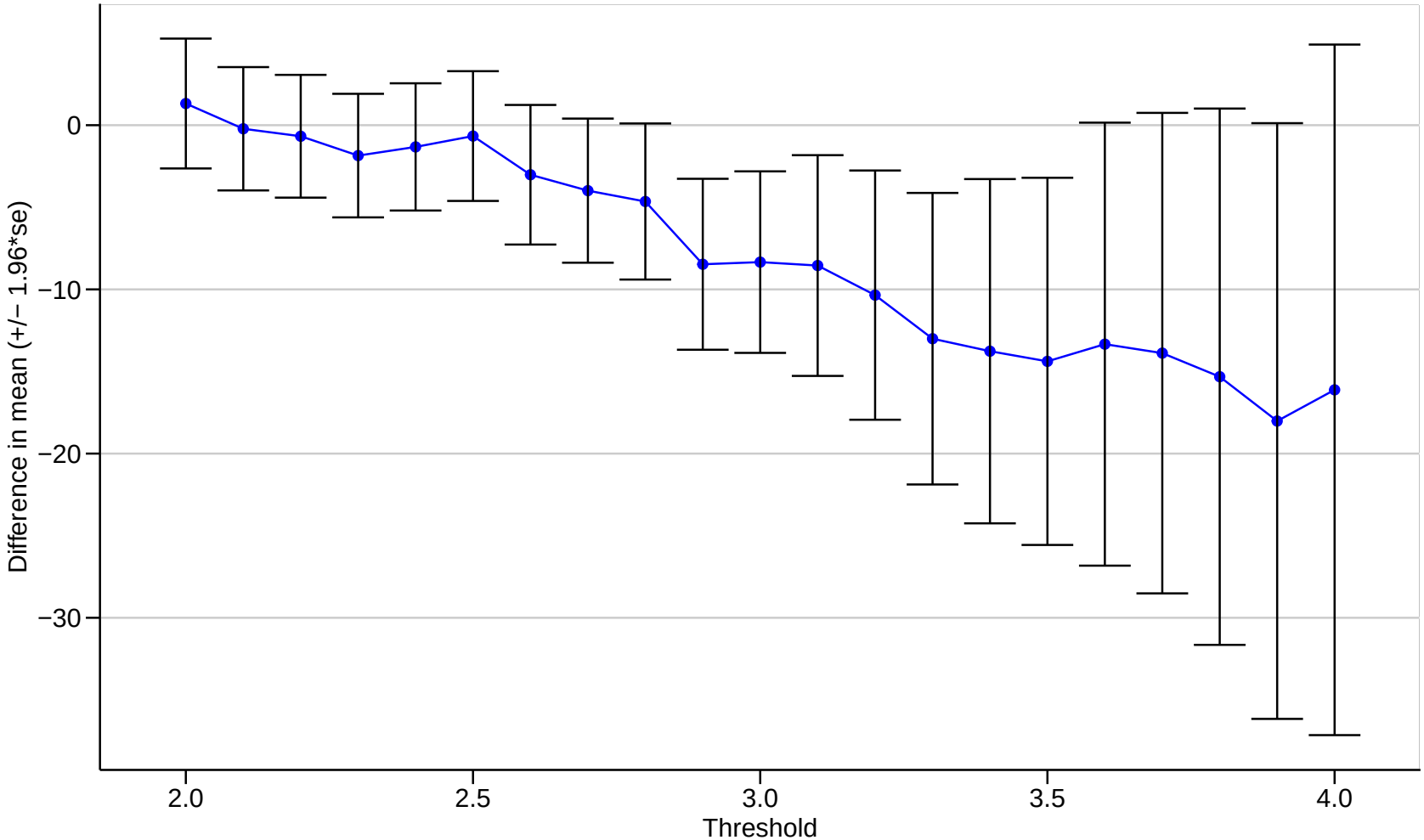


Figure 5: Difference in Mean between Trust Group above and below Threshold

# Regression of Trust Index on Covariates

Table 6: Regression of 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) |
| Obs | 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) | -0.675 | -0.460 | -1.667*** | -1.186** | -1.338** |
| | (0.558) | (0.459) | (0.481) | (0.531) | (0.552) |
| Obs | 10239 | 10358 | 10432 | 10303 | 9969 |

# 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.

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

- $\text{TrustGroup}_{ijg}$: 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) | -1.646*** | (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 | |

# Conclusions

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