# Charitable Giving, Tax Reform, and Government Efficiency*

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**Abstract**

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*JEL:* D91, I10, I18

## 1. Introduction

### *1.1. Charitable Giving and Taxiation*

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 for public good provision. To evaluate the effect of tax relief, many papers investigate the elasticity of charitable donations with respect to their tax price (Almunia et al., n.d.; Auten et al., 2002; Bakija and Heim, 2011; Fack and Landais, 2010; Randolph, n.d.). Focusing on the tax deduction on the charity, they show that the price elasticity of giving is about -1 or more in terms of absolute value, which means that the tax relief for the charitable giving is good in the sense that 1% tax relief derives more than 1% donation.

However, if the government can provide public good more efficiently than the direct donation, the donation may not be preferable because the public good provision via donation would be costly then. Moreover, when the government is much more efficient than charities, people may not donate so much even if they have a warm-glow preference. Saez (2004) suggests that the change of the relative price between public good provision by donation and government will change the behavior of people and the price elasticity of donation. However, the evaluation about the efficiency of the government is usually subjective and different for people. If someone regard the government as efficient, the perceived relative price of giving would be high for them. Thus, the giving behavior would be affected by the subjective perception towards the government.

Considering these points, this paper investigates (1) the price elasticity of giving and (2) whether the different perception towards the government cause the different giving behavior using South Korean panel

*This research is base on

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data. Our first main concern is the price elasticity of charity. South Korea (Korea hereafter) experienced the tax reform in 2014, from when the tax relief on charitable giving was conducted by tax credit, though tax deduction had been used before 2014. Thus, we exploit this tax reform as an exogenous policy change to derive the price elasticity of giving. Since the extant research focus on the tax reform within the scheme of tax deduction, this paper firstly deals with the tax reform from tax deduction system to tax credit system. Moreover, tax credit is less affected by the manipulation of tax price than tax deduction, since the income tax rate can be manipulated depending on the amount of deduction in tax deduction scheme though it cannot in tax credit scheme. This would enable us to conduct less biased estimates. Our result classifies that the price elasticity of giving in Korea is -1.07 ~ -1.26, which is within the range of the extant research.

Our second concern is the relationship between the giving behavior and the perception towards the government. As we explained, people feeling administrative inefficiency would consider the direct donation is more efficient and would have more willingness to donate. Using the Korean field data, we investigate this and show that the amount of donation is not different between those who regard government as inefficient and the others, though the giving price elasticity of the former is more elastic than the latter. This means that those who think of government as inefficient have more willingness to donate for 1% reduction of giving price.

This paper contributes two strands of charitable giving literature: the elasticity of charitable donations with respect to their tax price and the perception of government's inefficiency. The examples of papers in the first strand are (Almunia et al., n.d.; Auten et al., 2002; Bakija and Heim, 2011; Fack and Landais, 2010; Randolph, n.d.). They typically use the tax return data, the main part of which is the data about wealthy people. Since our data is based on survey, which represents the income distribution of population, we believe that we can estimate the giving price elasticity of population more precisely. Moreover, we use the data of Korea, a non-Western country, which the extant research did not examine.

In the second strand, there are some experimental studies and papers considering the tax evasion. Using an experiment, Li et al. (2011) compare people's willingness to give money for private charities and government agencies both of whose missions are the same. They show that people tend to donate for private charities more than government agency though they do not directly investigate the relationship between people's perception toward the government and giving behavior. Sheremeta and Uler (2020) show that people increase the voluntary public good provision when they face the wasteful government spending in the experimental setting. Although the government in their setting does not provide public good, they suggest that the willingness for donation may increase if people perceive the inefficiency of government. In the tax evasion literature, several paper suggests the perceived inefficiency of government reduce tax morale (Anderson, n.d.; Frey and Torgler, 2007; Hammar et al., 2009). We contribute on this literature by showing the relation between the perception of government efficiency and the giving behavior.

### *1.2. 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.

### *1.3. 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.

### *1.4. 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.

### *1.5. 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.

*1.6. 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.

## 2. Data

*2.1. 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 ~ 2019
  - We use survey data after 2013 to focus on tax policy change in 2014.

*2.2. Time Series of Chariable Giving*

*2.3. Summary Statistics of Covariates*

*2.4. Summary Statistics of Covariates (Cont'd)*

*2.5. 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

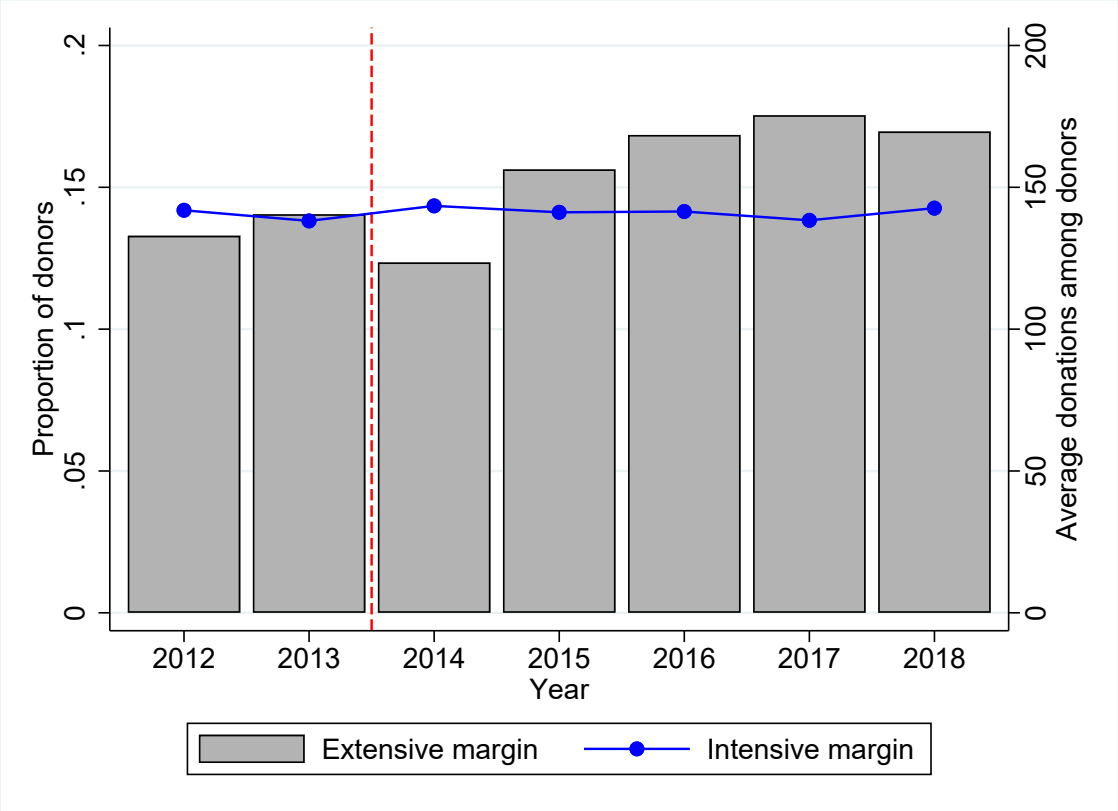



Figure 1: Proportion of Donors and Average Donations among Donors

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 |

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 |

$$x_i + g_i = y_i - T_i(y_i, g_i),$$

where $T_i$ is tax amount depending on the pre-tax income and charitable giving.

*2.6. 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.

*2.7. 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 $p_i^c = 1 - m$.

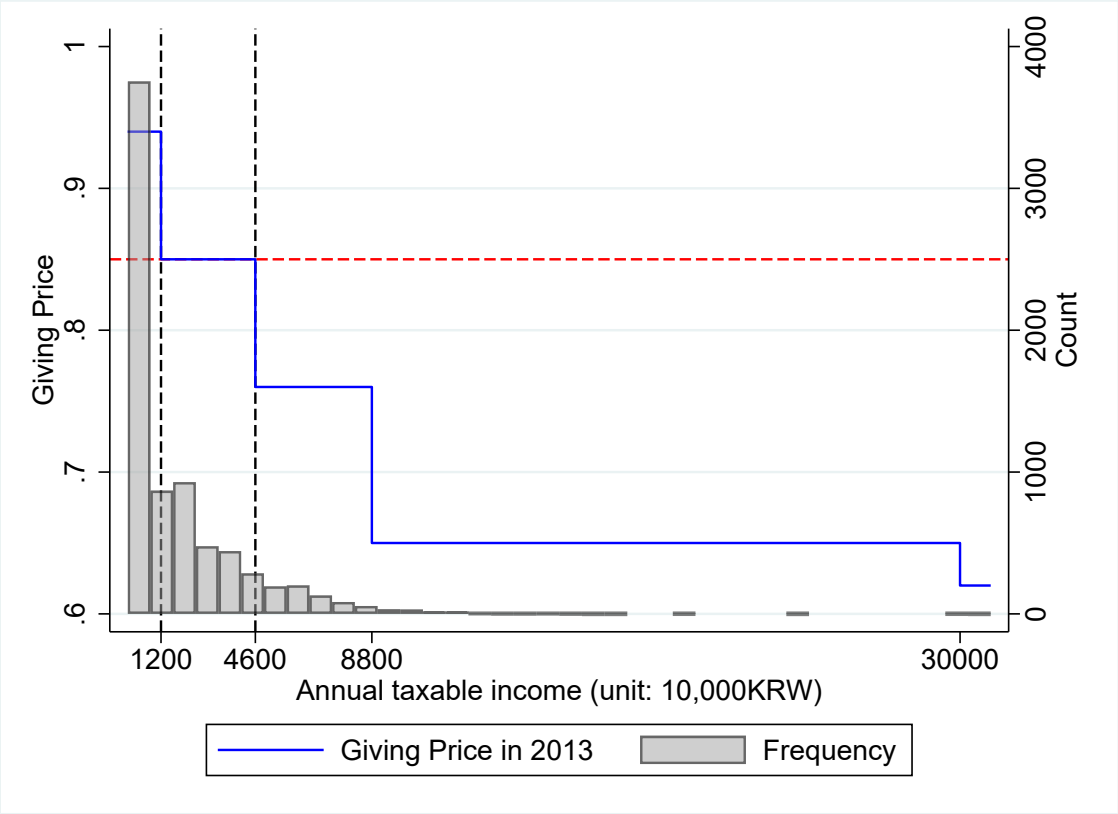



Figure 2: Income Distribution and Giving Price in 2013

*2.8. 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, $m = 0.15$.

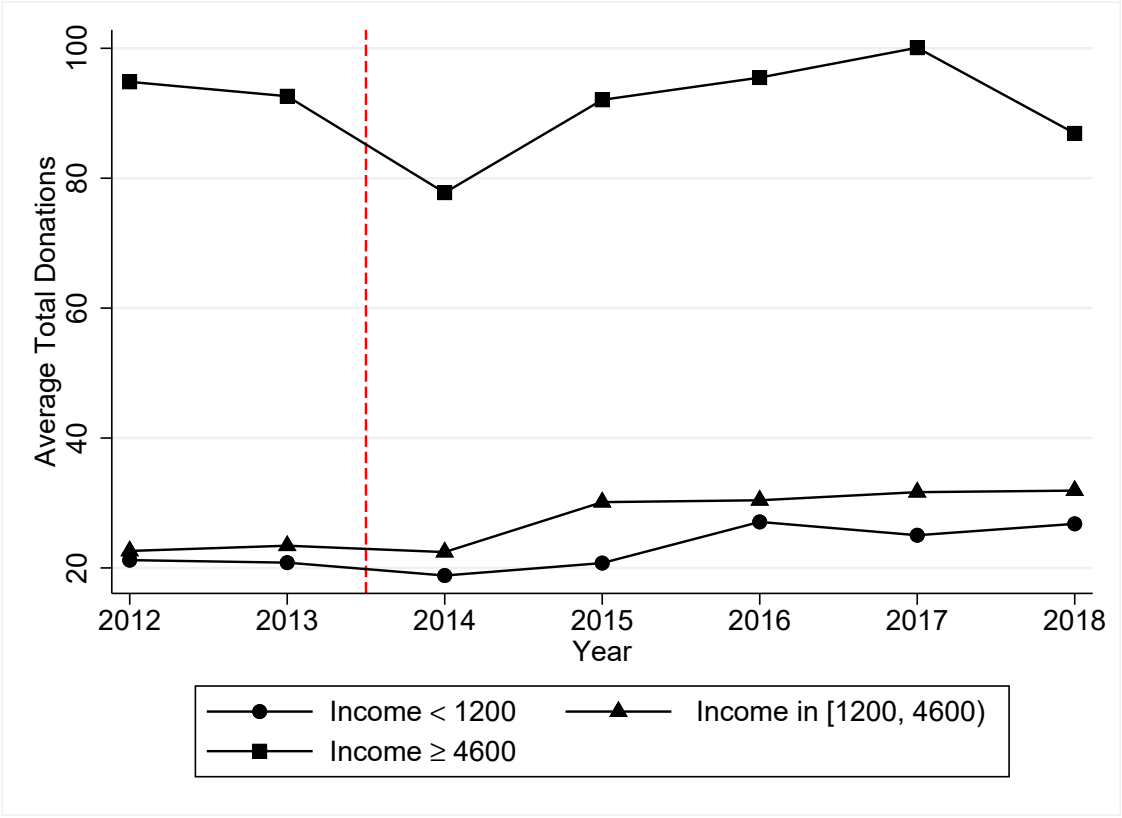



Figure 3: Time Series of Average Donations by Benefit Group

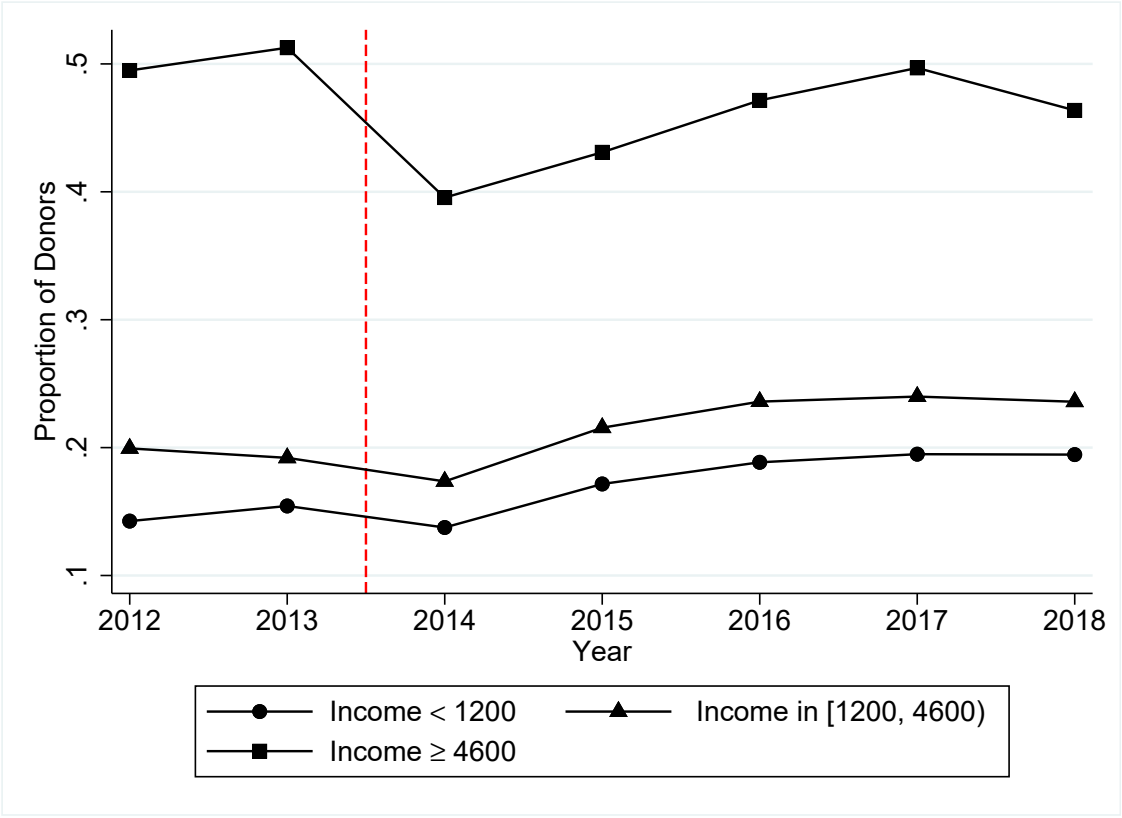



Figure 4: Time Series of Proportion of Donors by Benefit Group

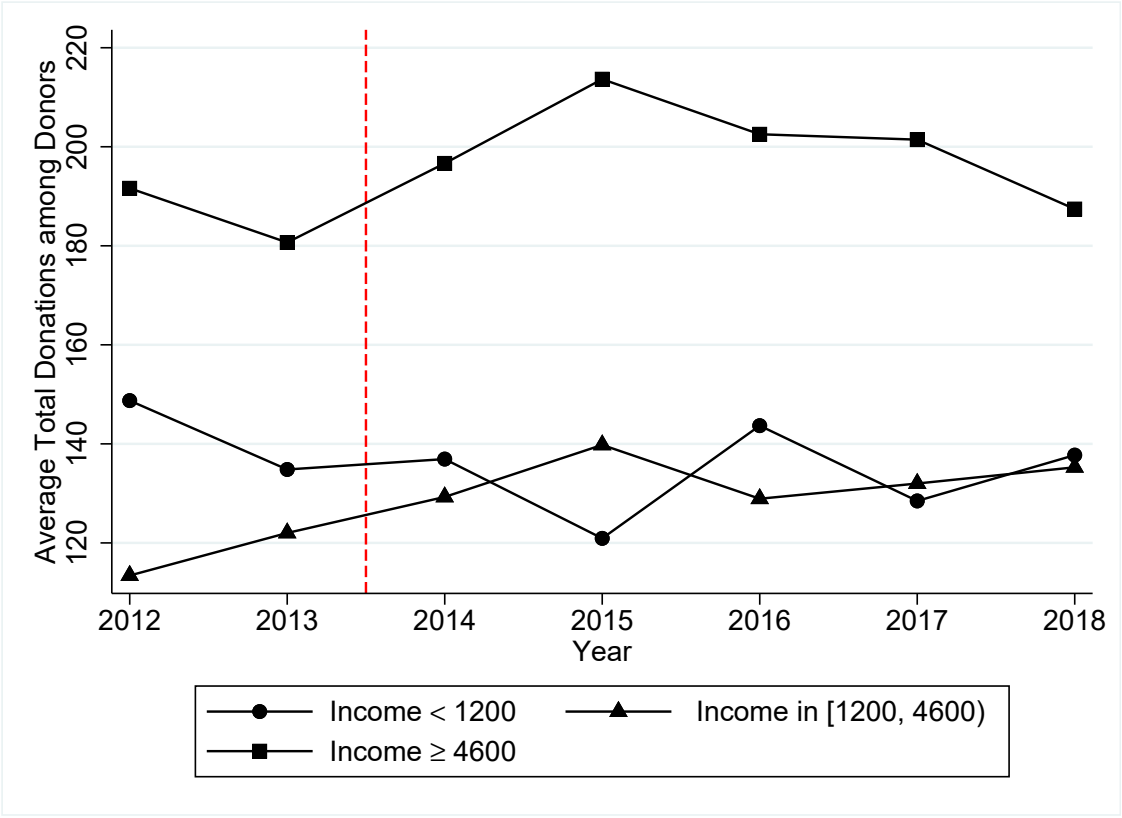



Figure 5: Time Series of Average Donations among Donors by Benefit Group

*2.9. Income Distribution and Giving Price*

*2.10. Time Series of Average Donations By Benefit Group*

*2.11. Time Series of Extensive Margin by Benfit Group*

*2.12. Time Series of Intensive Margin by Benfit Group*

*2.13. Empirical Strategy*

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.

*2.14. 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 $\beta_1$ 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.

## 3. Main Results

*3.1. Price and Income Elasticity*

*3.2. Robustness Check*

## 4. Governement Efficient and Price Elasticity

*4.1. 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.

Table 3: Main Results

| | (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) |
| Time FE | Y | Y | Y | Y | Y |
| Age | N | Y | Y | Y | Y |
| Year X Education | 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 |

Notes: $^{*}$ $p < 0.1$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$. Standard errors are clustered at individual level. When controlling age, we alson include its squared term.

### *4.2. Construct Efficient Index*

Questionnaire of tax-welfare balance index is

Table 4: Main Results: Intensive- and Extensive-Margin Elasticity

| | (1) | (2) | (3) | (4) | (5) |
|---|---|---|---|---|---|
| **Intensive-Margin Elasticity** | | | | | |
| ln(giving price) | -0.593*** | -0.843*** | -1.022*** | -0.887*** | -0.891*** |
| | (0.202) | (0.212) | (0.231) | (0.242) | (0.243) |
| N | 11704 | 11704 | 11704 | 11704 | 11704 |
| **Extensive-Margin Elasticity** | | | | | |
| ln(giving price) | -0.258*** | -0.290*** | -0.274*** | -0.238*** | -0.239*** |
| | (0.046) | (0.048) | (0.052) | (0.052) | (0.052) |
| Price elasticity at mean | -1.699*** | -1.907*** | -1.807*** | -1.569*** | -1.573*** |
| | (0.301) | (0.316) | (0.341) | (0.341) | (0.341) |
| Time FE | Y | Y | Y | Y | Y |
| Age | N | Y | Y | Y | Y |
| Year X Education | 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 |

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Standard errors are clustered at individual level. When controlling age, we alson include its squared term. The implied extensive-marign price elasticity is evaluated at the sample mean of $D_{ijt}$.

Table 5: Panel IV Results

| Lag $k$ | $k=1$ | $k=2$ | $k=3$ |
|---|---|---|---|
| | (1) | (2) | (3) |
| ln(giving price) | -1.279*** | -1.155*** | -1.150*** |
| | (0.478) | (0.414) | (0.369) |
| Individual FE | Y | Y | Y |
| Time FE | Y | Y | Y |
| Other Controls | Y | Y | Y |
| F-stat of IV | 10315.94 | 11506.64 | 11569.61 |
| N | 51548 | 49217 | 46399 |

Notes: $^{*}$ $p<0.1$, $^{**}$ $p<0.05$, $^{***}$ $p<0.01$. Standard errors are clustered at individual level. Other controls are age (its squared value), the interaction between year dummies and education dummies, the interaction between year dummies and gender dummies, and resident area. The instumental variable is $\log(\text{Price}_{ijt}/\text{Price}_{ij(t-k)})$.

Table 6: Panel IV Results: Intensive- and Extensive-Margin Elasticity

| Lag $k$ | $k=1$ | $k=2$ | $k=3$ |
|---|---|---|---|
| | (1) | (2) | (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) |
| Price elasticity at mean | -2.000*** | -1.939*** | -1.628*** |
| | (0.725) | (0.615) | (0.558) |
| Individual FE | Y | Y | Y |
| Time FE | Y | Y | Y |
| Other Controls | Y | Y | Y |
| F-stat of IV | 10315.94 | 11506.64 | 11569.61 |
| N | 51548 | 49217 | 46399 |

Notes: $^{*}$ $p < 0.1$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$. Standard errors are clustered at individual level. Other controls are age (its squared value), the interaction between year dummies and education dummies, the interaction between year dummies and gender dummies, and resident area. The instumental variable is $\log(\text{Price}_{ijt}/\text{Price}_{ij(t-k)})$. The implied extensive-marign price elasticity is evaluated at the sample mean of $D_{ijt}$.

Table 7: Results with 2013 and 2014 Data

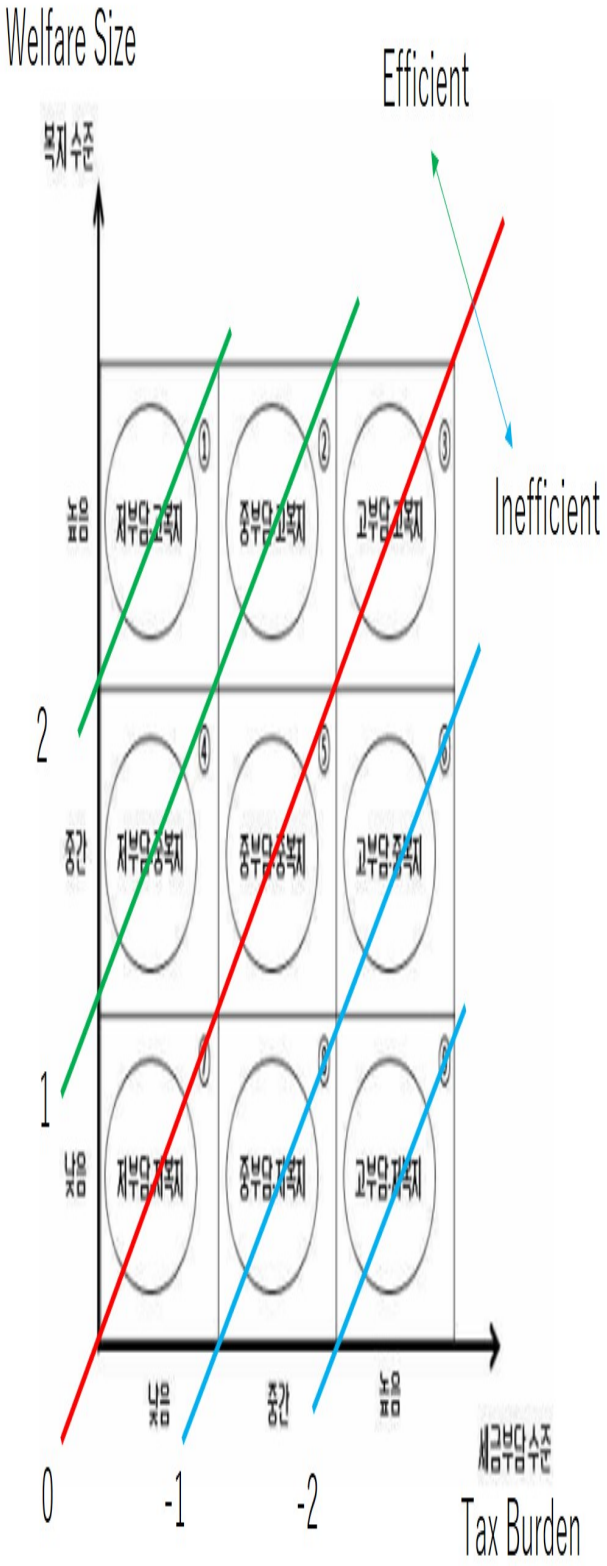
| Model | FE | Panel IV | | |
|---|---|---|---|---|
| Lag $k$ | | $k=1$ | $k=2$ | $k=3$ |
| | (1) | (2) | (3) | (4) |
| ln(giving price) | -1.466*** | -1.535*** | -1.683*** | -1.151*** |
| | (0.327) | (0.360) | (0.378) | (0.385) |
| Individual FE | Y | Y | Y | Y |
| Time FE | Y | Y | Y | Y |
| Other Controls | Y | Y | Y | Y |
| F-stat of IV | | 7420.10 | 4490.74 | 5034.58 |
| N | 15134 | 13727 | 12902 | 12420 |

Notes: $^{*}$ $p < 0.1$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$. Standard errors are clustered at individual level. Other controls are age (its squared value), the interaction between year dummies and education dummies, the interaction between year dummies and gender dummies, and resident area. The instumental variable is $\log(\text{Price}_{ijt}/\text{Price}_{ij(t-k)})$.

Table 8: Intensive- and Extensive-Margin Elasticity with 2013 and 2014 Data

| Model | FE | Panel IV with FE | | |
|---|---|---|---|---|
| Lag $k$ | | $k=1$ | $k=2$ | $k=3$ |
| | (1) | (2) | (3) | (4) |
| **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) |
| Individual FE | Y | Y | Y | Y |
| Time FE | Y | Y | Y | Y |
| Other Controls | Y | Y | Y | Y |
| F-stat of IV | | 7420.10 | 4490.74 | 5034.58 |
| N | 15134 | 13727 | 12902 | 12420 |

Notes: $^{*}$ $p < 0.1$, $^{**}$ $p < 0.05$, $^{***}$ $p < 0.01$. Standard errors are clustered at individual level. Other controls are age (its squared value), the interaction between year dummies and education dummies, the interaction between year dummies and gender dummies, and resident area. The instumental variable is $\log(\text{Price}_{ijt}/\text{Price}_{ij(t-k)})$. The implied extensive-marign price elasticity is evaluated at the sample mean of $D_{ijt}$.


Welfare Size
Efficient
복지수준
Inefficient
높음
중간
낮음
2
1
0
-1
-2
저부담고복지
중부담고복지
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낮음
중간
높음
세금부담수준
Tax Burden

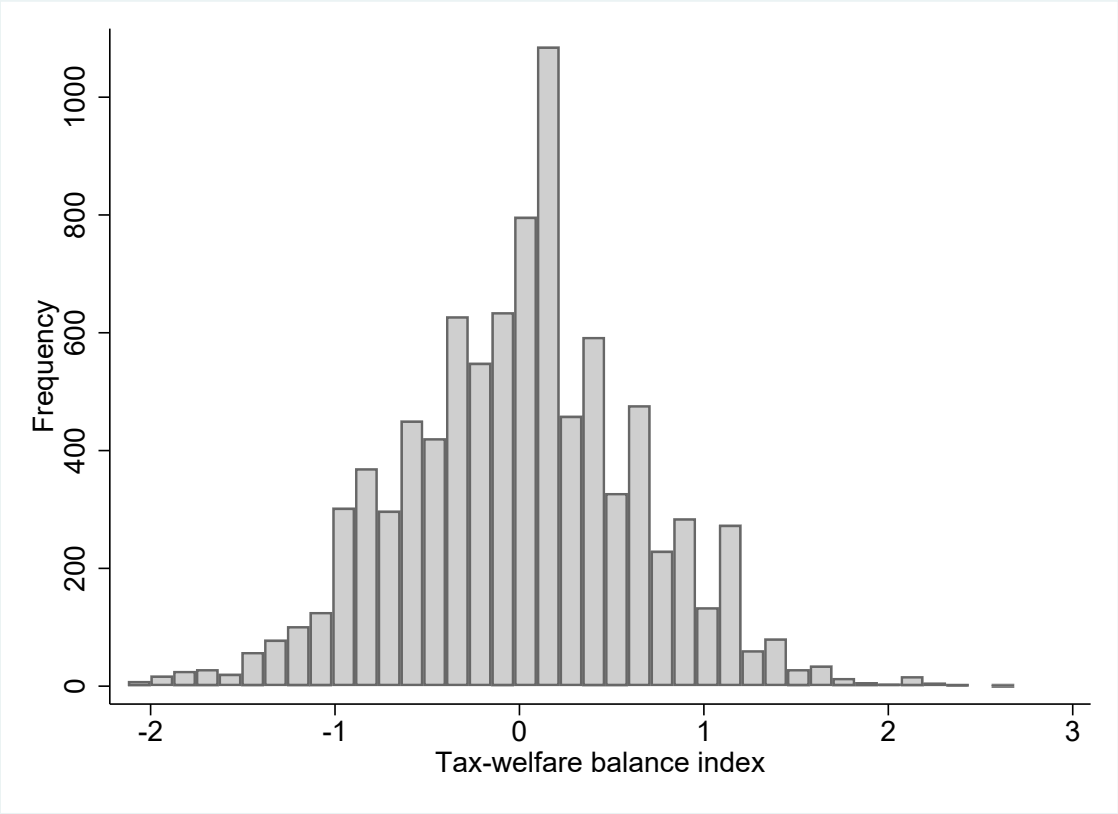


Figure 6: Histogram of Efficient Index

To rule out government's policies, we use individual fixed effect as the **efficient index**

*4.3. Histrogram of Efficient Index*

*4.4. Heterogenous Price Elasticity by Governement Efficiency*

To see the heterogenous price elasticity by efficient index, We estimated the baseline regression model (5) (see Table **??**), 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).

*4.5. Efficient Groups: Descriptive Stats*

*4.6. Efficient Groups: Descriptive Statis (Extensive Margin)*

*4.7. Efficient Groups: Descriptive Stats (Intensive Margin)*

*4.8. Efficient Groups: Estimation Results*

*4.9. Robustness Check*

1. Efficient index captures both government efficiency on concerns about budget deficits

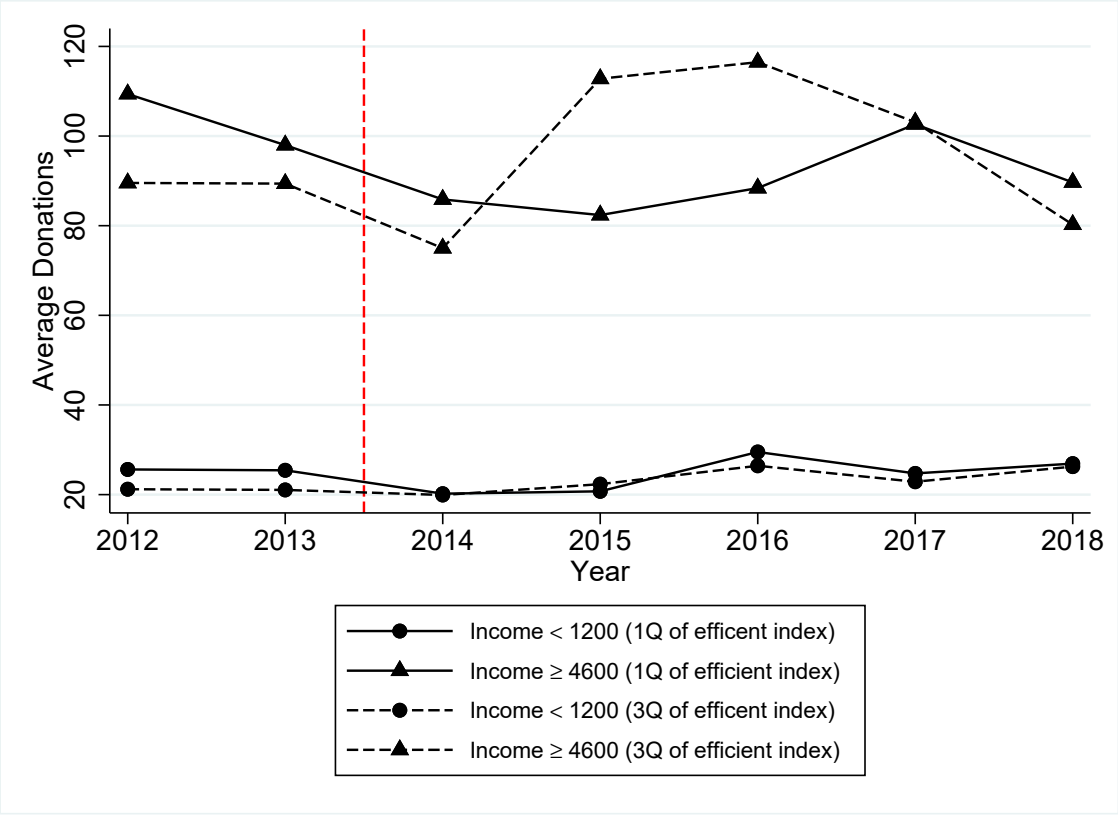


Figure 7: Time Series of Average Donations by Subgroup

Table 9: Price Elasticity by Three Quantile Efficient Groups

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

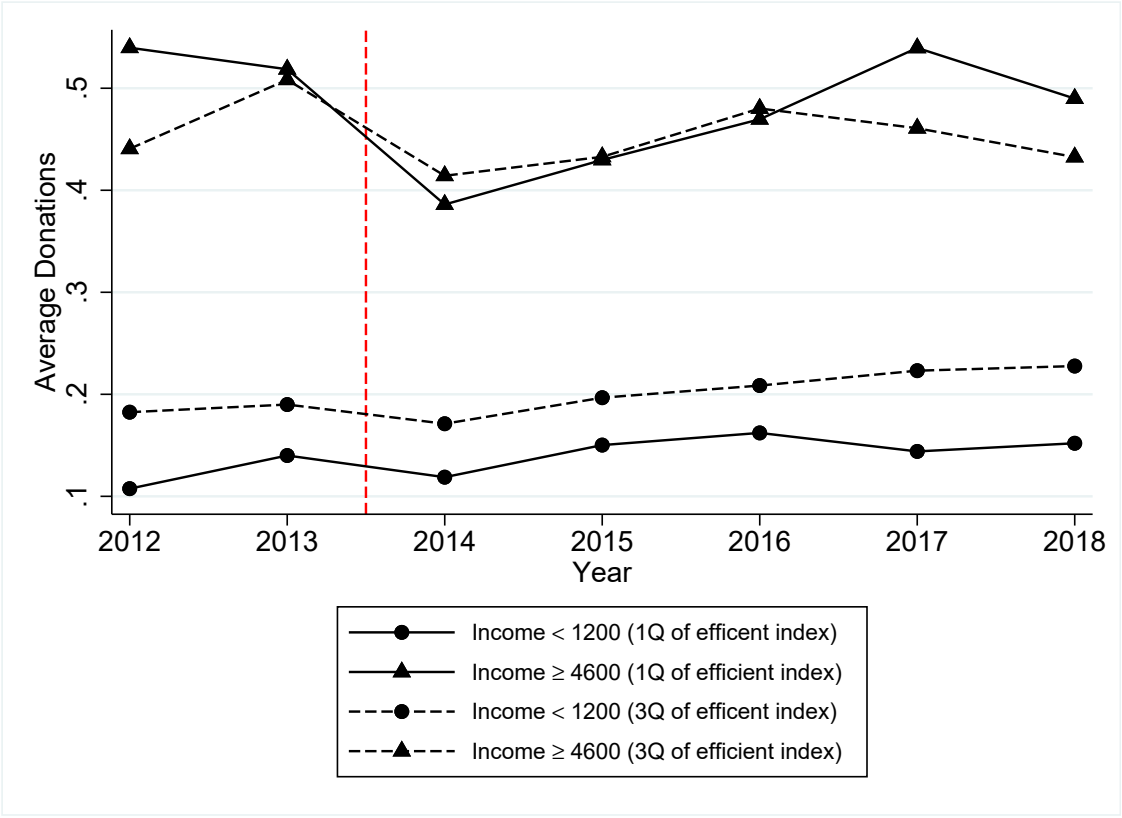


Figure 8: Time Series of Proportion of Donors by Subgroup

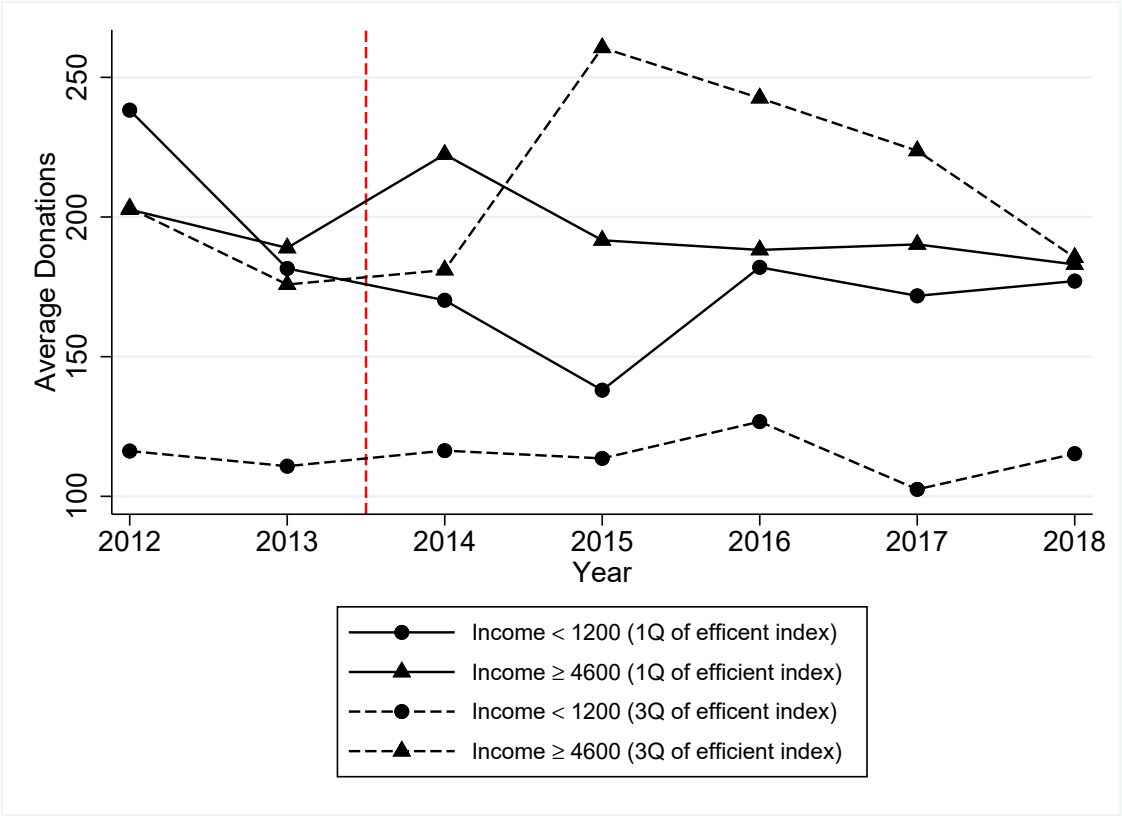


Figure 9: Time Series of Average Donations among Donors by Subgroup

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

### *4.10. 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 droped 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 indexs are not statistically siginificant zero.

### *4.11. Robustness Check 1: Estimation Results*

### *4.12. 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 droped 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.

Table 10: Heterogenous Price Elasticity by Efficiency Using Units with Ideal Efficient Index > 0

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

Table 11: Robustness Check of Heterogenous Price Elasiticity by Government Efficiency

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

Table 12: Robustness Check of Heterogenous Extensive-Margin Price Elasiticity by Government Efficiency

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

Table 13: Robustness Check of Heterogenous Intenstive-Margin Price Elasiticity by Government Efficiency

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

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