Charitable Giving, Tax Reform, and Political Trust

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Introduction

Introduction

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

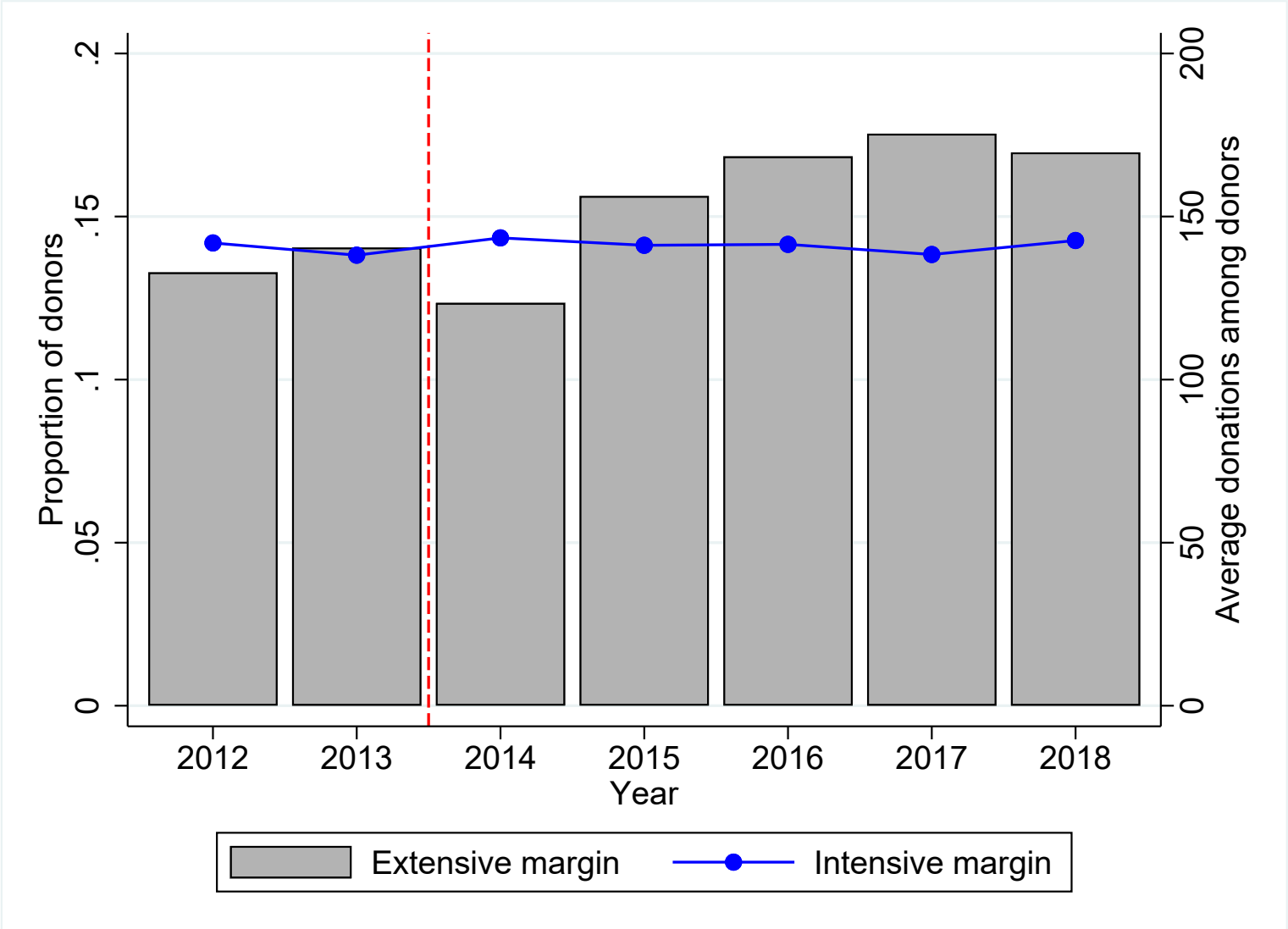


Figure 1: Proportion of Donors and Average Donations among Donors

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

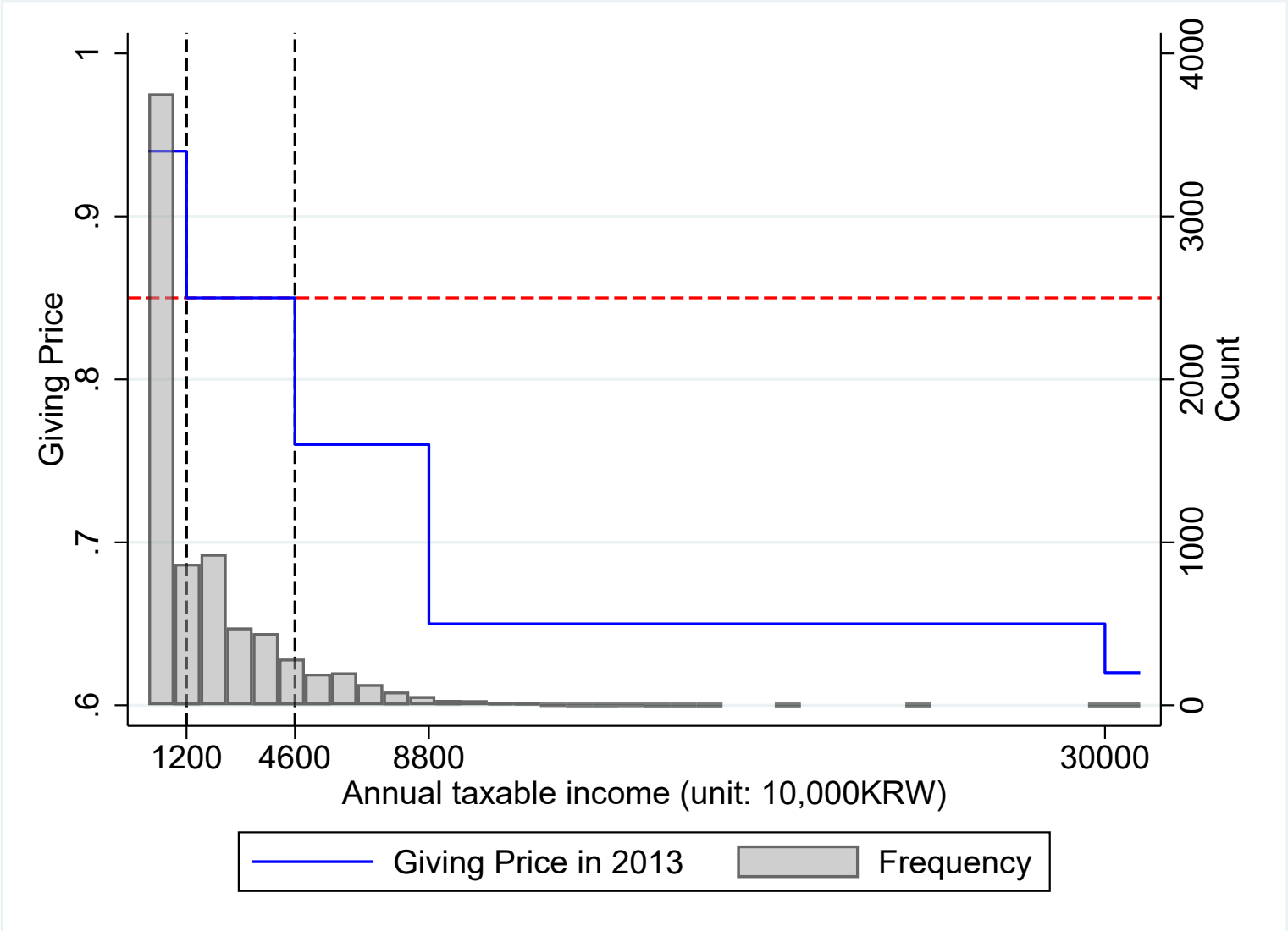


Figure 2: Income Distribution and Giving Price in 2013

Time Series of Average Donations By Benefit Group

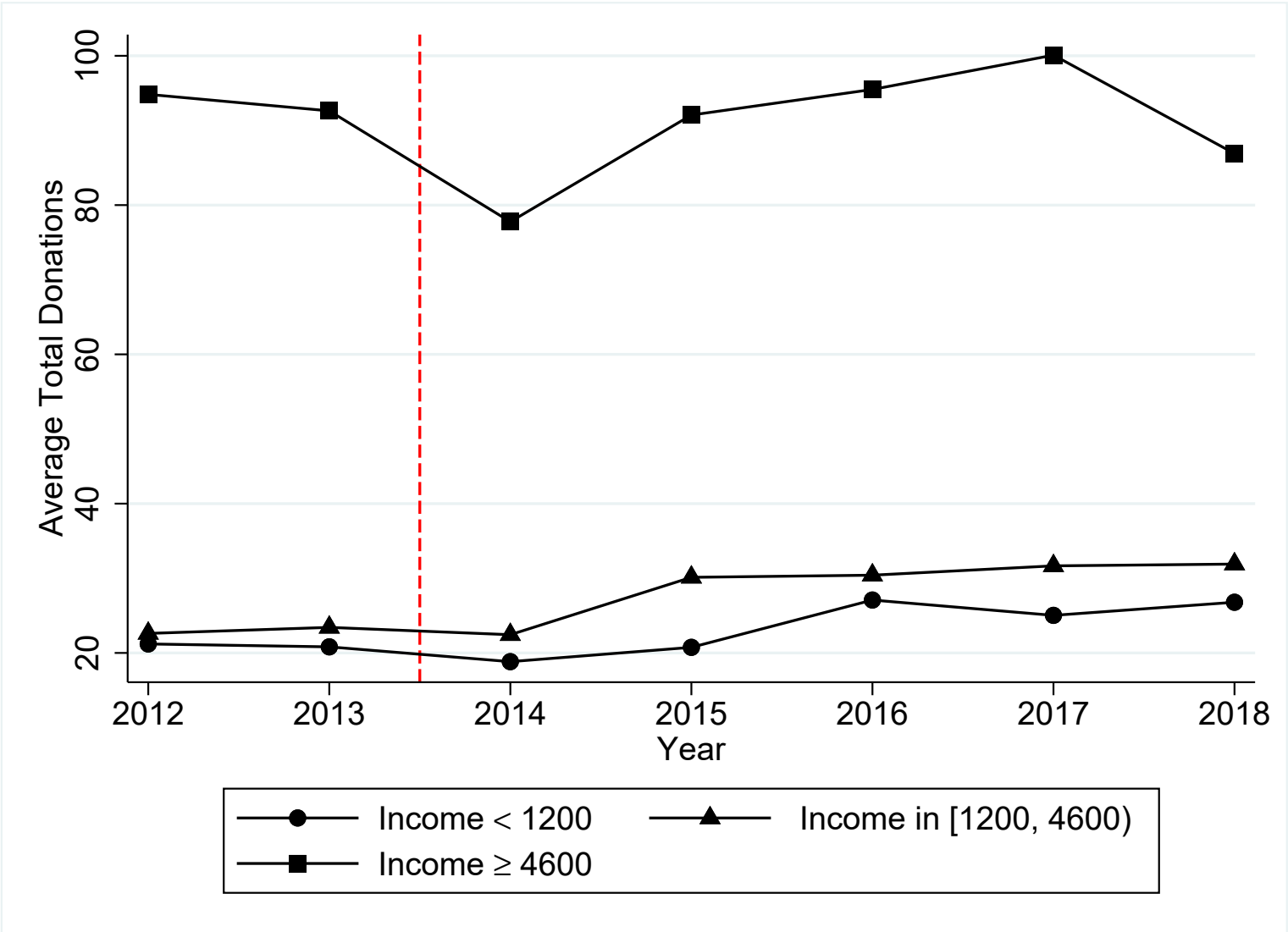


Figure 3: Time Series of Average Donations by Benefit Group

Time Series of Extensive Margin by Benfit Group

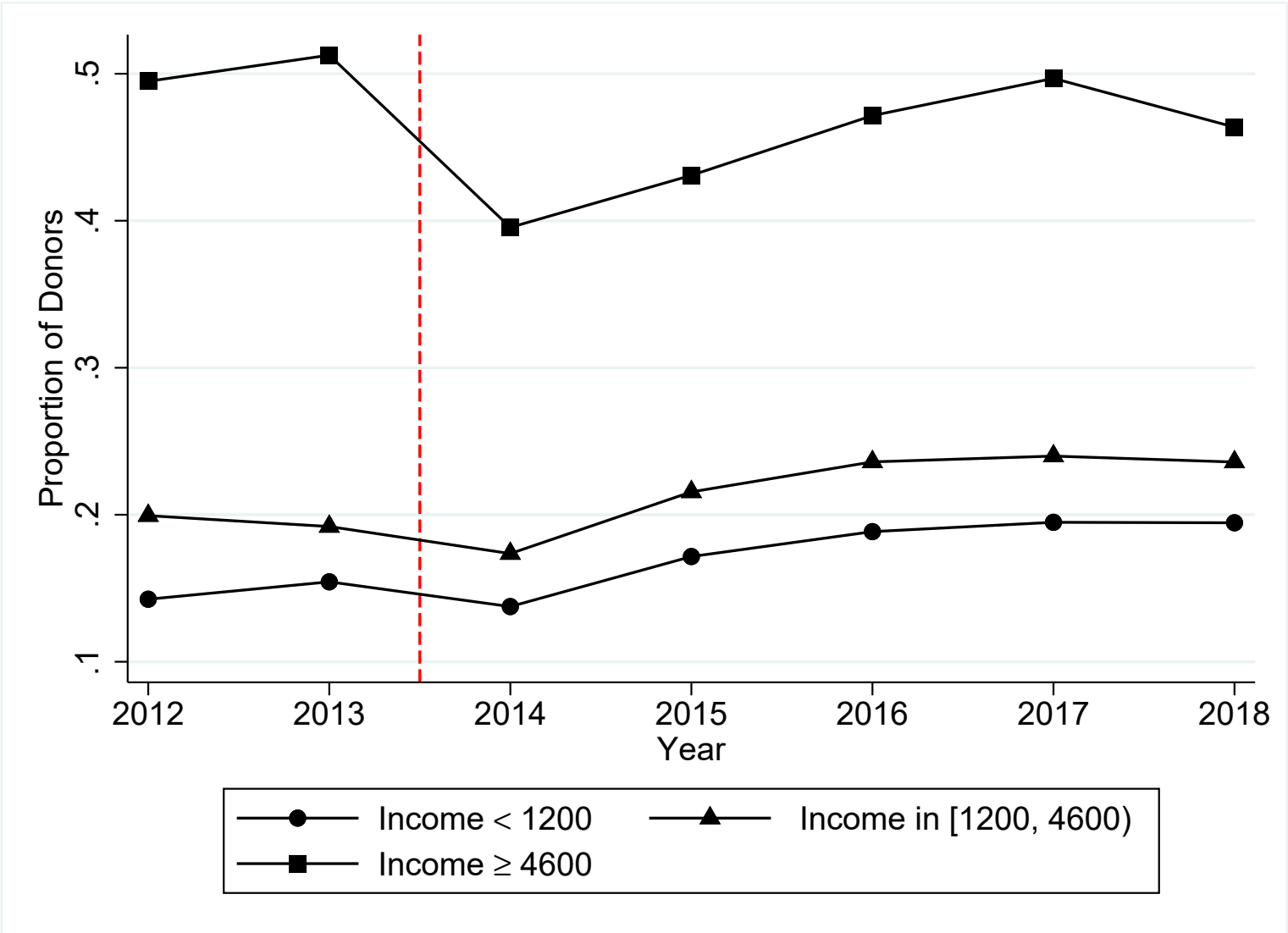


Figure 4: Time Series of Proportion of Donors by Benefit Group

Time Series of Intensive Margin by Benfit Group

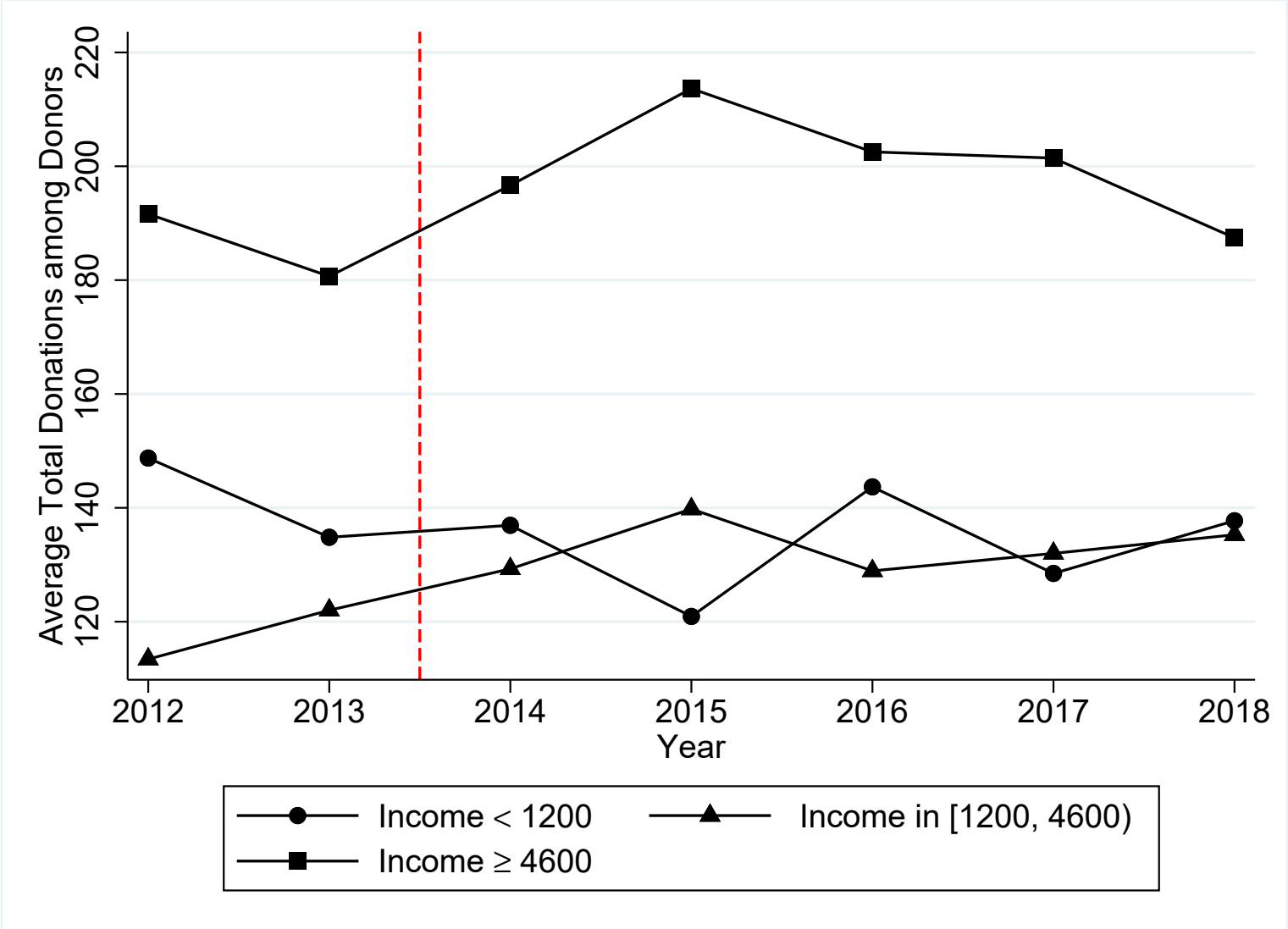


Figure 5: Time Series of Average Donations among Donors by Benefit Group

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. Income and donations are determined simultaneously
2. Effect of presidential transition on donation behavior
3. Last price elasticity
4. Self-selection of receiving tax benefit
5. Transitory and permanent elasticity

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 charitable giving.
  - In May 2017, South Korea 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 her due to the shinking of MV Sewol (April 2014).
- 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

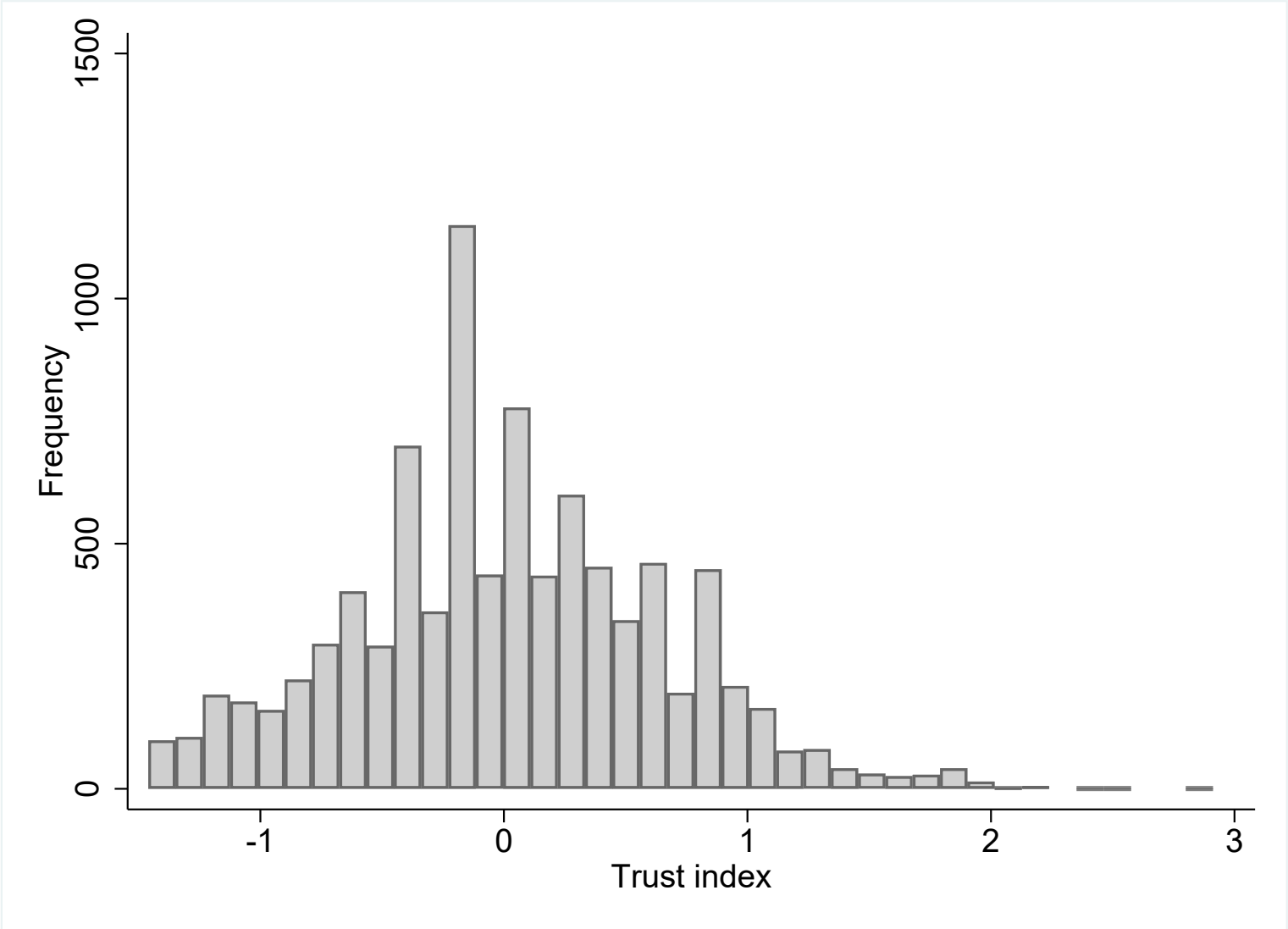


Figure 6: Histogram of Trust Index

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.

- Three quantile groups: we divide units i into the first, second, and third quantile of trust index (1Q, 2Q, and 3Q, respectively).

Trust Groups: Descriptive Stats

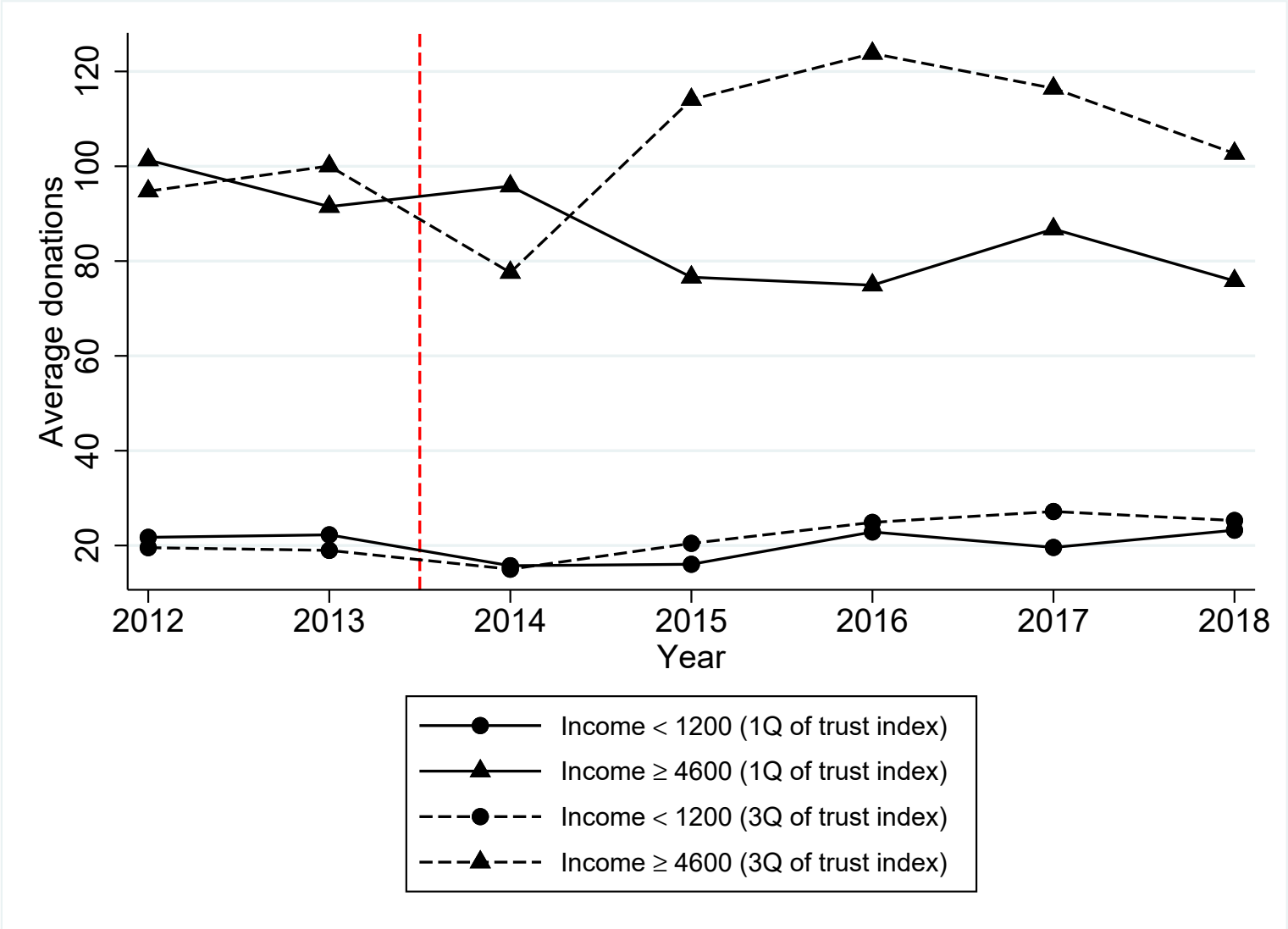


Figure 7: Time Series of Average Donations by Subgroup

Trust Groups: Descriptive Statis (Extensive Margin)

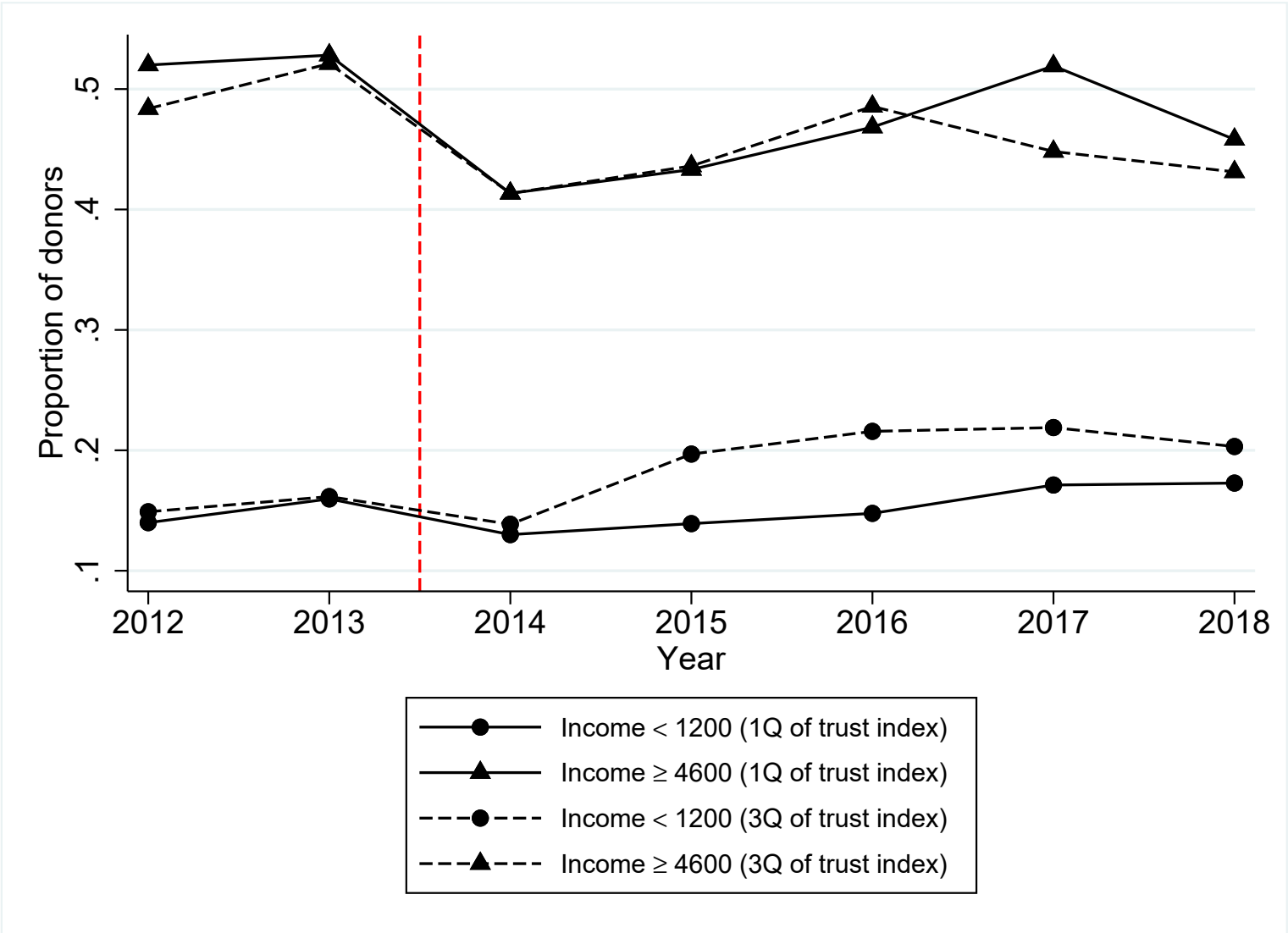


Figure 8: Time Series of Proportion of Donors by Subgroup

Trust Groups: Descriptive Stats (Intensive Margin)

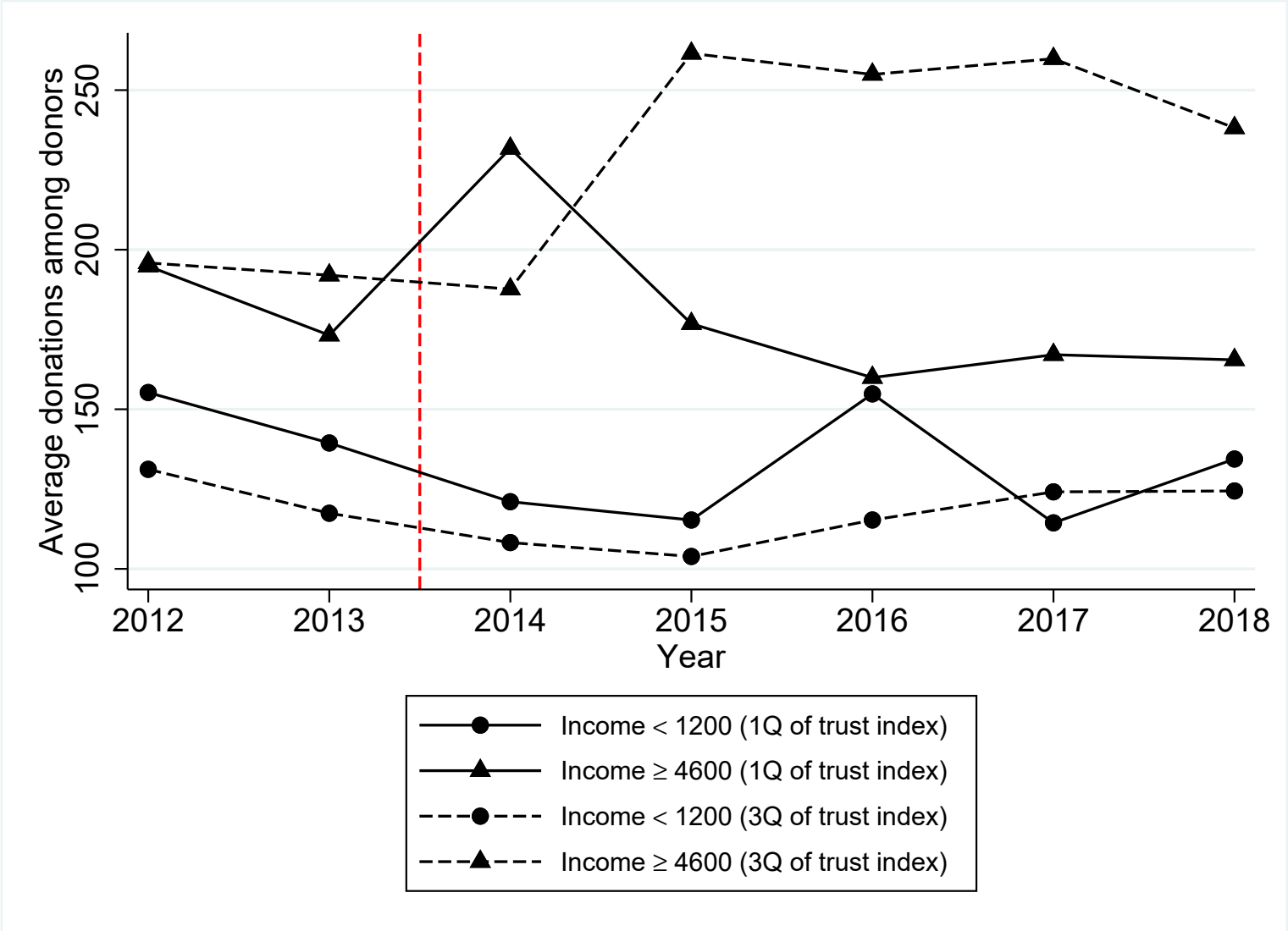


Figure 9: Time Series of Average Donations among Donors by Subgroup

Trust Groups: Estimation Result

Table 9: Price Elasticity by Three Quantile Trust Groups

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

Robustness Check

1. Effect of presidential transition on trust index
2. Effect of presidential transition on donation behavior
3. Income and donations are determined simultaneously
4. Last price elasticity
5. Self-selection of receiving tax benefit
6. Transitory and permanent elasticity

Robustness Check 1: Presidential Transition Effect on Trust

- Even though we control time fixed effect when estimating the trust index, we may not rule out the effect of presidential transition on it perfectly.
- To check this point, we repeat estimate the same model using either data in 2015 and 2016 (Park's trust index) or in 2017 and 2018 (Moon's trust index), and obtain the president-specific trust indexs. After that, we test whether the average individual difference b/w these two indexs is statistically different from zero (pair-wise t-test).
- As a result, the average individual difference is -0.008 (s.e. = 0.01). This difference is not statistically different from zero (p-value = 0.446).

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 estimate 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.

Note that f-statistics of IV is greater than 1000 when we estimate overall elasticity and extensive-margin elasticity, and greater than 400 when we estimate the intensive-margin elasticity.

Robustness Check 2: Result

Table 10: Robustness Check of Heterogenous Price Elasiticity by Political Trust

	1Q	2Q	3Q
FE Model			
ln(giving price)	-0.485	-2.901***	-1.164*
	(0.564)	(0.563)	(0.623)
N	4713	4489	4586
Panel IV (k = 1)			
ln(giving price)	-0.347	-3.307***	-1.242*
	(0.639)	(0.602)	(0.656)
N	4337	4109	4190
Panel IV (k = 2)			
ln(giving price)	-0.617	-3.314***	-1.204*
	(0.627)	(0.689)	(0.702)
N	4100	3839	3975
Panel IV (k = 3)			
ln(giving price)	-0.230	-2.536***	-0.807
	(0.684)	(0.673)	(0.691)
N	3947	3700	3832

Robustness Check 2: Result (Extensive Margin)

Table 11: Robustness Check of Heterogenous Extensive-Margin Price Elasiticity by Political Trust

	1Q	2Q	3Q
FE Model			
Implied Elasticity	-0.834	-3.347***	-1.386*
	(0.728)	(0.672)	(0.774)
N	4713	4489	4586
Panel IV (k = 1)			
Implied Elasticity	-0.438	-3.880***	-1.658*
	(0.816)	(0.732)	(0.846)
N	4337	4109	4190
Panel IV (k = 2)			
Implied Elasticity	-1.082	-3.864***	-1.223
	(0.805)	(0.797)	(0.878)
N	4100	3839	3975
Panel IV (k = 3)			
Implied Elasticity	-0.852	-3.176***	-0.850
	(0.881)	(0.806)	(0.893)
N	3947	3700	3832

Robustness Check 2: Result (Intensive Margin)

Table 12: Robustness Check of Heterogenous Intenstive-Margin Price Elasiticity by Political Trust

	1Q	2Q	3Q
FE Model			
ln(giving price)	-0.946*	-0.969*	-0.622
	(0.540)	(0.575)	(0.673)
N	904	958	931
Panel IV (k = 1)			
ln(giving price)	-1.408**	-0.687	-0.396
	(0.636)	(0.710)	(0.841)
N	847	898	881
Panel IV (k = 2)			
ln(giving price)	-1.117*	-0.912	-0.696
	(0.651)	(0.657)	(0.787)
N	812	850	844
Panel IV (k = 3)			
ln(giving price)	-0.640	-0.611	-0.327
	(0.609)	(0.596)	(0.698)
N	777	819	816

Governement Efficient and Price Elasticity

Government Efficiency

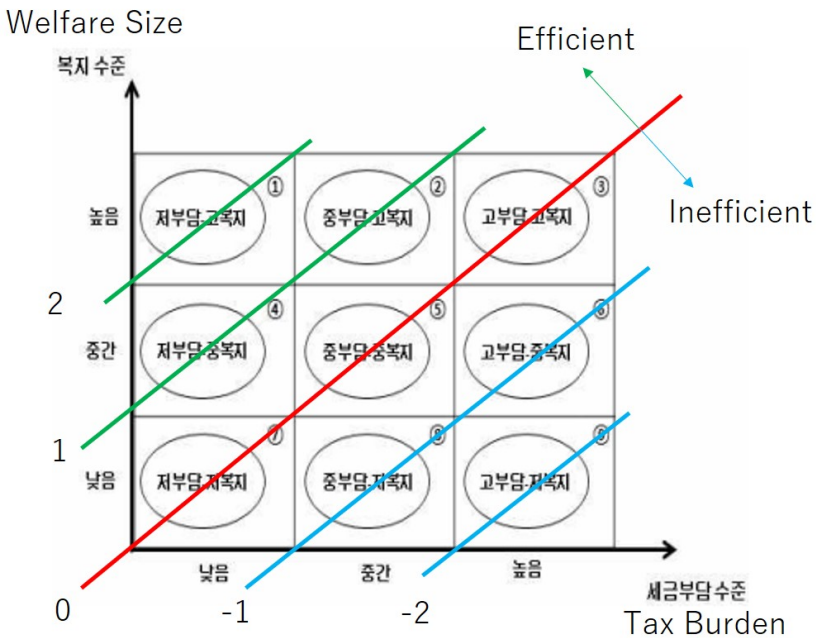
From the 2015 survey, NaSTaB asks the current and ideal balance between tax burden and welfare size.

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 **efficient index**

Histrogram of Efficient Index

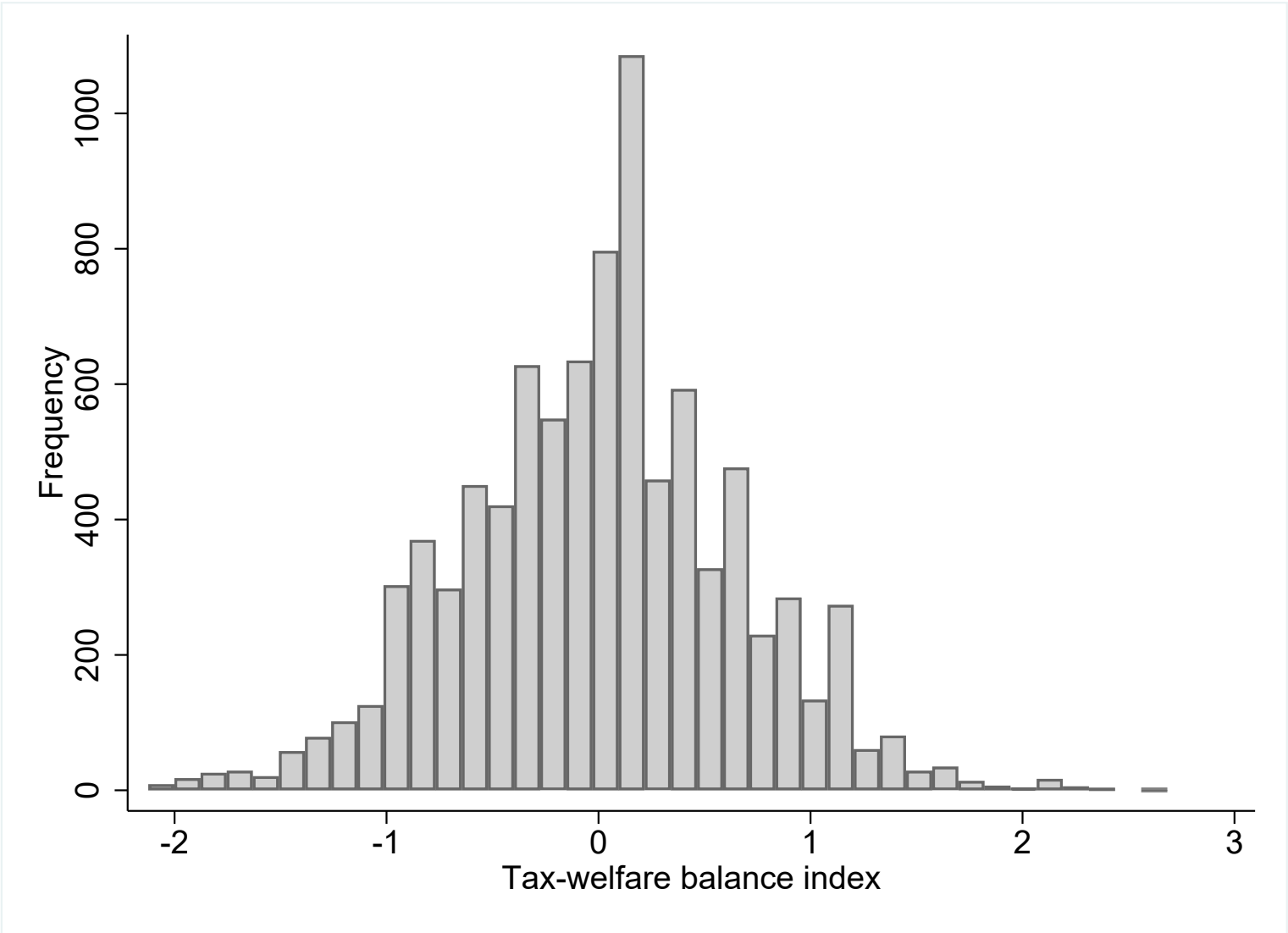


Figure 10: Histogram of Efficient Index

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.

- Three quantile groups: we divide units i into the first, second, and third quantile of efficient index (1Q, 2Q, and 3Q, respectively).

Efficient Groups: Descriptive Stats

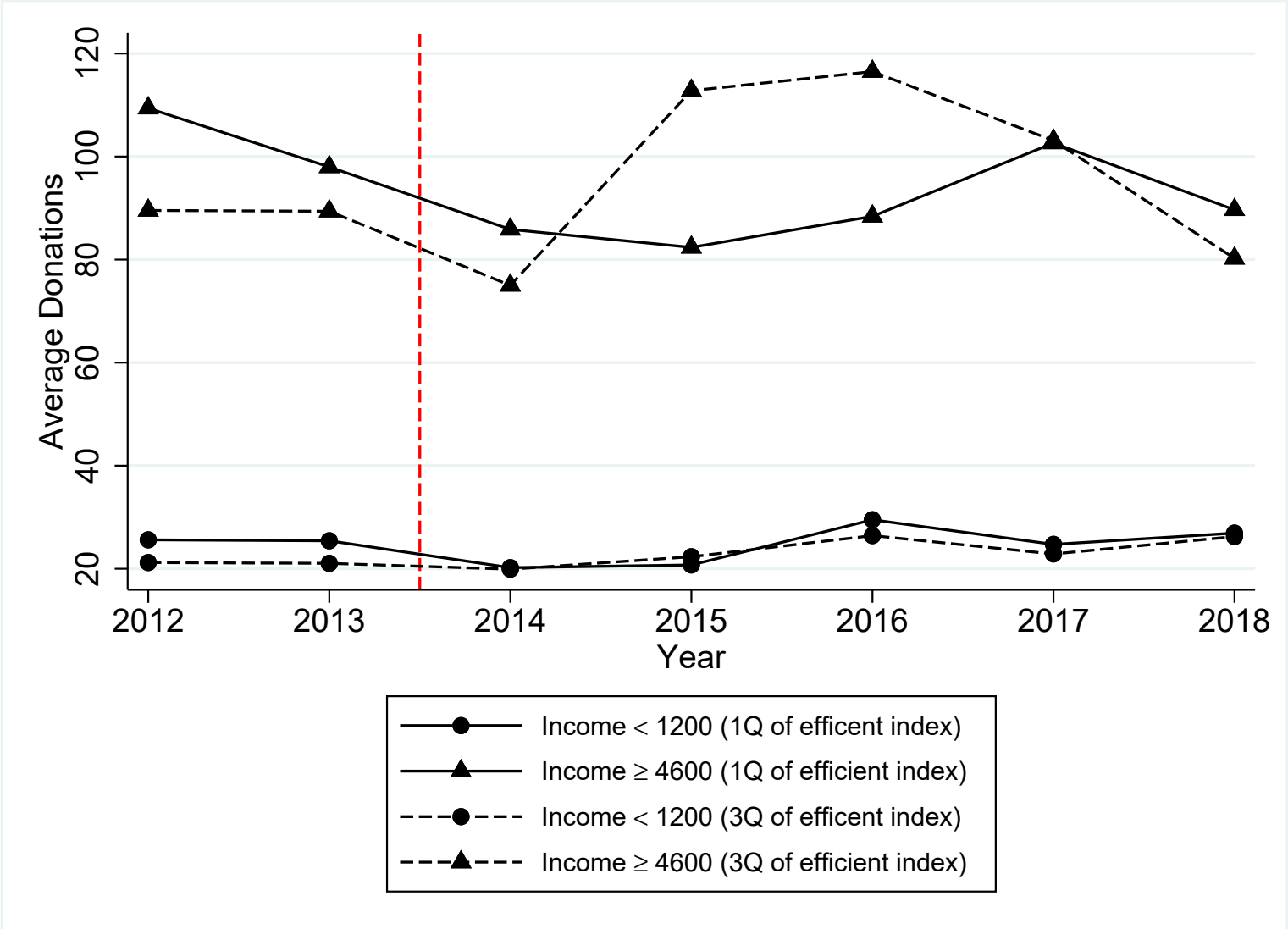


Figure 11: Time Series of Average Donations by Subgroup

Efficient Groups: Descriptive Statis (Extensive Margin)

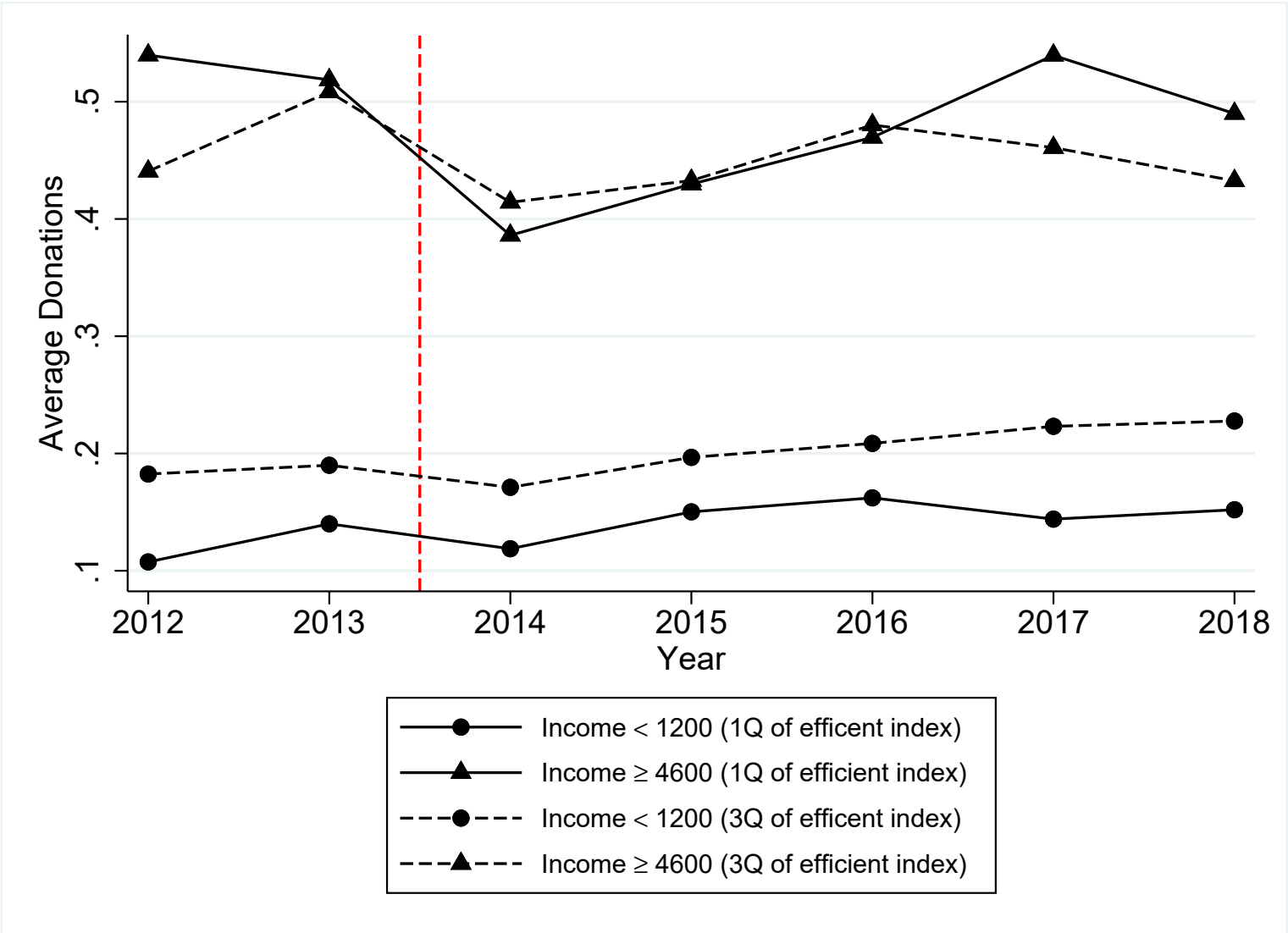


Figure 12: Time Series of Proportion of Donors by Subgroup

Efficient Groups: Descriptive Stats (Intensive Margin)

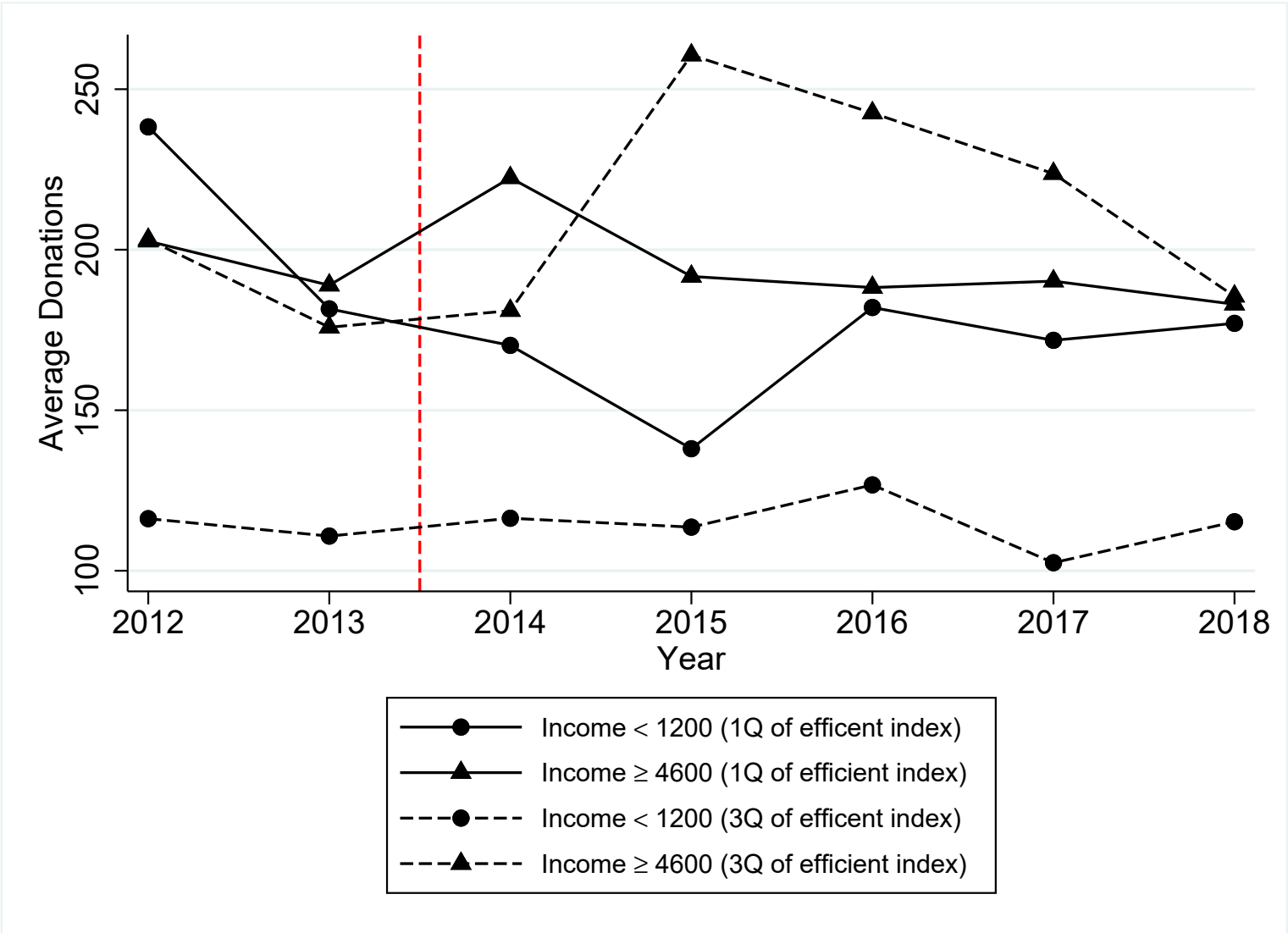


Figure 13: Time Series of Average Donations among Donors by Subgroup

Efficient Groups: Estimation Results

Table 13: 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

Robustness Check

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

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.

Robustness Check 1: Estimation Results

Table 14: 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

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.

Robustness Check 2: Result

Table 15: 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

Robustness Check 2: Result (Extensive Margin)

Table 16: 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

Robustness Check 2: Result (Intensive Margin)

Table 17: 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

Conclusions

Conclusions