Deduction data

Last updated on 2023/12/06

About September Data Analysis

- Donations include religious-related giving (not policital giving)
- MTR is calculated by pre-tax total income (`tinc`)
- Incentive limit is based on religious-related giving
  - 10% of total income if $t < 2014$
  - 30 million KRW if $2014 \leq t < 2016$
  - 20 million KRW if $2016 \leq t$

About September Data Analysis

- Study Sample
  1. Age ≥ 24
  2. Observed between 2010 and 2018
  3. Exclude observations with no donation and declaration
  4. Exclude pre-tax income around thresholds (2 million KRW)
  5. Exclude pre-tax income is in bracket (F) or (G)
  6. Exclude unpaid family workers, housewives, and students
  7. donation less than total income or incentive limit

New Study Sample A

```
use <- StartAnalysis$new(here("data/shaped2.csv"))
```

- Current sample size: 24923
  - Taxpayers
  - Positive taxable income
  - No experience of bracket (F) and (G)
  - Age ≥ 24
  - Observed between 2010 and 2018
  - Exclude observations with no donation and declaration
  - donation less than 10% of taxable total income

Summary Stats

Table 1: Summary of New Study Sample A

	N	Mean	Std.Dev.
Income and giving price			
Annual taxable income (unit: 10,000KRW)	24923	2883.47	2697.06
Appricale price	24923	0.85	0.05
Charitable giving			
Annual chariatable giving (unit: 10,000KRW)	24923	21.64	73.17
Dummary of donation > 0	24923	0.24	0.43
Dummy of declaration of giving	24923	0.15	0.36
Demographics			
Age	24923	44.01	10.81
Wage earner dummy	24921	0.72	0.45
Number of household members	24923	3.42	1.13
Number of children	24923	0.80	0.95
Number of dependents in household	24923	0.05	0.24
Number of taxpayers in household	24923	3.37	1.14
Female dummy	24923	0.34	0.47
Academic history: University	24923	0.60	0.49
Academic history: High school	24923	0.34	0.47

Additional Sample Restriction

```
use2 <- use$clone(deep = TRUE)
use2$data <- subset(
  use2$data,
  family_position == 1 & work %in% c(1, 3)
)
```

- Sample size: 15562
  - Household heads who are self-employed or full-time wage earners

Summary Stats, Again

Table 2: Summary of New Study Sample B

	N	Mean	Std.Dev.
Income and giving price			
Annual taxable income (unit: 10,000KRW)	15562	3535.16	2879.37
Appricale price	15562	0.85	0.05
Charitable giving			
Annual chariatable giving (unit: 10,000KRW)	15562	26.85	84.76
Dummary of donation > 0	15562	0.27	0.44
Dummy of declaration of giving	15562	0.19	0.39
Demographics			
Age	15562	46.10	9.93
Wage earner dummy	15562	0.72	0.45
Number of household members	15562	3.33	1.18
Number of children	15562	0.90	0.97
Number of dependents in household	15562	0.07	0.27
Number of taxpayers in household	15562	3.26	1.18
Female dummy	15562	0.09	0.29
Academic history: University	15562	0.60	0.49
Academic history: High school	15562	0.33	0.47

Analysis Using New Study Sample A

Applicable and Effective Price Elasticities

Table 3: Main Results of New Study Sample A

	Log donation			Dummy of donor		
	FE		FE-2SLS	FE		FE-2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Applicable price (β_a)	−1.020**			−0.107*		
	(0.418)			(0.063)		
Effective price (β_e^{FE})		−0.870***			−3.340***	
		(0.319)			(0.095)	
Effective price (β_e^{IV})			−1.527**			−0.464*
			(0.635)			(0.261)
Log taxable income	0.571*	0.567*	0.469	0.333***	0.127***	0.319***
	(0.339)	(0.335)	(0.346)	(0.038)	(0.032)	(0.039)
Implied price elasticity						
Estimate				−0.437*	−13.692***	−1.903*
				(0.259)	(0.389)	(1.068)
1st stage information (Excluded instrument: Applicable price)						
F-statistics of instrument			1010.063			993.121
Wu-Hausman test, p-value			0.136			< 0.001
Num.Obs.	6080	6080	6080	24921	24921	24921

Elasticities on Declared Donations

Table 4: Elasticities on Declared Donations (New Study Sample A)

	Log donation
	FE
	(1)
Applicable price (β_a)	-0.771
	(0.594)
Log taxable income	0.140
	(0.552)
Num.Obs.	3823

Elasticities of Declaration

Table 5: Elasticities of Declaration (New Study Sample A)

	1 = Declaration
	FE
	(1)
Applicable price	−0.136**
	(0.056)
Log taxable income	0.268***
	(0.030)
Implied price elasticity	
Estimate	−0.888**
	(0.366)
Num.Obs.	24 921

Policy Effect

Table 6: Policy Effect (New Study Sample A)

		Declaration (%)		Effective price			Intensive-margin		Extensive-margin	
2013 Income bracket	N	2013	2014	2013	2014	Change (%)	2013 average	Change (%)	2013 average	Change (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(A) [0, 1200)	879	4.778	2.617	0.997	0.996	-0.097	2.361	0.160	0.101	0.189
(B) [1200, 4600)	1448	21.961	15.124	0.967	0.977	1.300	18.332	-2.133	0.281	-2.528
(C) [4600, 8800)	421	42.993	33.017	0.897	0.950	7.184	56.287	-11.789	0.499	-13.973
(D) & (E) [8800, 30000)	93	32.258	29.032	0.887	0.956	11.104	113.323	-18.222	0.473	-21.598
Weighted average						2.060		-3.381		-4.008

Analysis Using New Study Sample B

Applicable and Effective Price Elasticities

Table 7: Main Results of New Study Sample B

	Log donation			Dummy of donor		
	FE		FE-2SLS	FE		FE-2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Applicable price (β_a)	−0.942*			−0.071		
	(0.510)			(0.073)		
Effective price (β_e^{FE})		−0.873**			−3.124***	
		(0.360)			(0.105)	
Effective price (β_e^{IV})			−1.352*			−0.272
			(0.739)			(0.269)
Log taxable income	0.480	0.465	0.388	0.325***	0.118***	0.317***
	(0.365)	(0.356)	(0.374)	(0.042)	(0.035)	(0.043)
Implied price elasticity						
Estimate				−0.260	−11.503***	−1.000
				(0.267)	(0.387)	(0.991)
1st stage information (Excluded instrument: Applicable price)						
F-statistics of instrument			735.740			711.552
Wu-Hausman test, p-value						
Num.Obs.	4226	4226	4226	15 562	15 562	15 562

Elasticities on Declared Donations

Table 8: Elasticities on Declared Donations (New Study Sample B)

	Log donation
	FE
	(1)
Applicable price (β_a)	-0.731
	(0.691)
Log taxable income	0.039
	(0.532)
Num.Obs.	2895

Elasticities of Declaration

Table 9: Elasticities of Declaration (New Study Sample B)

	1 = Declaration
	FE
	(1)
Applicable price	−0.117*
	(0.069)
Log taxable income	0.261***
	(0.034)
Implied price elasticity	
Estimate	−0.629*
	(0.369)
Num.Obs.	15 562

Policy Effect

Table 10: Policy Effect (New Study Sample B)

		Declaration (%)		Effective price			Intensive-margin		Extensive-margin	
2013 Income bracket	N	2013	2014	2013	2014	Change (%)	2013 average	Change (%)	2013 average	Change (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(A) [0, 1200)	343	5.831	3.207	0.997	0.995	-0.123	3.034	0.177	0.114	0.152
(B) [1200, 4600)	1013	21.816	14.610	0.967	0.978	1.345	18.553	-1.939	0.268	-1.665
(C) [4600, 8800)	370	41.622	32.162	0.900	0.952	6.924	53.118	-9.984	0.486	-8.572
(D) & (E) [8800, 30000)	84	34.524	30.952	0.879	0.954	11.832	121.000	-17.061	0.488	-14.647
Weighted average						2.694		-3.885		-3.335

Excluding religious donation

Summary Statistics of Donation (New Study Sample A)

```
use3 <- use$clone(deep = TRUE)
use3$data$donate <- with(use3$data, donate - religious_donate)
use3$data$donate_ln <- with(use3$data, log(donate))
use3$data$d_donate <- with(use3$data, ifelse(donate > 0, 1, 0))
summary(use3$data$donate)
```

```
##     Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    0.000   0.000   0.000   7.011   0.000 900.000
```

Results of New Study Sample A (1)

Table 11: Main Results of New Study Sample A

	Log donation			Dummy of donor		
	FE		FE-2SLS	FE		FE-2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Applicable price (β_a)	−1.332*			0.035		
	(0.687)			(0.057)		
Effective price (β_e^{FE})		−1.027**			−2.124***	
		(0.463)			(0.096)	
Effective price (β_e^{IV})			−1.890*			0.152
			(0.975)			(0.249)
Log taxable income	0.087	0.088	−0.075	0.224***	0.077***	0.229***
	(0.560)	(0.551)	(0.579)	(0.030)	(0.026)	(0.034)
Implied price elasticity						
Estimate				0.246	−14.981***	1.074
				(0.399)	(0.677)	(1.760)
1st stage information (Excluded instrument: Applicable price)						
F-statistics of instrument			576.930			993.121
Wu-Hausman test, p-value			0.187			< 0.001
Num.Obs.	3534	3534	3534	24921	24921	24921

Results of New Study Sample A (2)

Table 12: Elasticities on Declared Donation (New Study Sample A)

	Log donation
	FE
	(1)
Applicable price (β_a)	-1.103
	(0.899)
Log taxable income	-0.017
	(0.829)
Num.Obs.	2560

Results of New Study Sample A (3)

Table 13: Elasticities of Declaration (New Study Sample A)

	1 = Declaration
	FE
	(1)
Applicable price	−0.136**
	(0.056)
Log taxable income	0.268***
	(0.030)
Implied price elasticity	
Estimate	−0.888**
	(0.366)
Num.Obs.	24 921

Results of New Study Sample A (4)

Table 14: Policy Effect (New Study Sample A)

		Declaration (%)		Effective price			Intensive-margin		Extensive-margin	
2013 Income bracket	N	2013	2014	2013	2014	Change (%)	2013 average	Change (%)	2013 average	Change (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(A) [0, 1200)	879	4.778	2.617	0.997	0.996	-0.097	1.011	0.170	0.057	-0.145
(B) [1200, 4600)	1448	21.961	15.124	0.967	0.977	1.300	7.900	-2.272	0.189	1.942
(C) [4600, 8800)	421	42.993	33.017	0.897	0.950	7.184	23.095	-12.558	0.335	10.733
(D) & (E) [8800, 30000)	93	32.258	29.032	0.887	0.956	11.104	33.312	-19.410	0.269	16.590
Weighted average						2.060		-3.602		3.078

Summary Statistics of Donation (New Study Sample B)

```
use4 <- use2$clone(deep = TRUE)
use4$data$donate <- with(use4$data, donate - religious_donate)
use4$data$donate_ln <- with(use4$data, log(donate))
use4$data$d_donate <- with(use4$data, ifelse(donate > 0, 1, 0))
summary(use4$data$donate)
```

```
##     Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    0.000   0.000   0.000   8.659   0.000 850.000
```

Results of New Study Sample B (1)

Table 15: Main Results of New Study Sample B

	Log donation			Dummy of donor		
	FE		FE-2SLS	FE		FE-2SLS
	(1)	(2)	(3)	(4)	(5)	(6)
Applicable price (β_a)	−1.539*			0.049		
	(0.810)			(0.067)		
Effective price (β_e^{FE})		−0.890*			−1.959***	
		(0.500)			(0.105)	
Effective price (β_e^{IV})			−2.103*			0.189
			(1.109)			(0.262)
Log taxable income	0.019	0.082	−0.139	0.221***	0.077**	0.226***
	(0.587)	(0.570)	(0.605)	(0.035)	(0.031)	(0.039)
Implied price elasticity						
Estimate				0.295	−11.802***	1.136
				(0.404)	(0.634)	(1.580)
1st stage information (Excluded instrument: Applicable price)						
F-statistics of instrument			451.371			711.552
Wu-Hausman test, p-value						
Num.Obs.	2583	2583	2583	15 562	15 562	15 562

Results of New Study Sample B (2)

Table 16: Elasticities on Declared Donations (New Study Sample B)

	Log donation
	FE
	(1)
Applicable price (β_a)	-1.481
	(1.052)
Log taxable income	-0.333
	(0.926)
Num.Obs.	1945

Results of New Study Sample B (3)

Table 17: Elasticities of Declaration (New Study Sample B)

	1 = Declaration
	FE
	(1)
Applicable price	−0.117*
	(0.069)
Log taxable income	0.261***
	(0.034)
Implied price elasticity	
Estimate	−0.629*
	(0.369)
Num.Obs.	15 562

Results of New Study Sample B (4)

Table 18: Policy Effect (New Study Sample B)

		Declaration (%)		Effective price			Intensive-margin		Extensive-margin	
2013 Income bracket	N	2013	2014	2013	2014	Change (%)	2013 average	Change (%)	2013 average	Change (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(A) [0, 1200)	343	5.831	3.207	0.997	0.995	-0.123	1.305	0.222	0.070	-0.168
(B) [1200, 4600)	1013	21.816	14.610	0.967	0.978	1.345	8.339	-2.433	0.188	1.842
(C) [4600, 8800)	370	41.622	32.162	0.900	0.952	6.924	20.435	-12.525	0.330	9.486
(D) & (E) [8800, 30000)	84	34.524	30.952	0.879	0.954	11.832	36.583	-21.403	0.286	16.209
Weighted average						2.694		-4.873		3.691