Deduction data

Last updated on 2023/12/05

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: 24458
  - 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)	24458	2897.09	2712.00
Appricale price	24458	0.85	0.05
Charitable giving			
Annual chariatable giving (unit: 10,000KRW)	24458	21.73	73.26
Dummary of donation > 0	24458	0.25	0.43
Dummy of declaration of giving	24458	0.16	0.36
Demographics			
Age	24458	44.06	10.86
Wage earner dummy	24456	0.72	0.45
Number of household members	24458	3.40	1.13
Number of children	24458	0.78	0.94
Number of dependents in household	24458	0.05	0.23
Number of taxpayers in household	24458	3.36	1.13
Female dummy	24458	0.33	0.47
Academic history: University	24458	0.60	0.49
Academic history: High school	24458	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: 15469
  - 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)	15469	3539.76	2880.97
Appricale price	15469	0.85	0.05
Charitable giving			
Annual chariatable giving (unit: 10,000KRW)	15469	26.84	84.53
Dummary of donation > 0	15469	0.27	0.45
Dummy of declaration of giving	15469	0.19	0.39
Demographics			
Age	15469	46.11	9.94
Wage earner dummy	15469	0.73	0.45
Number of household members	15469	3.32	1.18
Number of children	15469	0.90	0.97
Number of dependents in household	15469	0.07	0.27
Number of taxpayers in household	15469	3.26	1.18
Female dummy	15469	0.09	0.29
Academic history: University	15469	0.60	0.49
Academic history: High school	15469	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)	−1.156***			−0.102		
	(0.423)			(0.064)		
Effective price (β_e^{FE})		−0.905***			−3.329***	
		(0.319)			(0.096)	
Effective price (β_e^{IV})			−1.711***			−0.438*
			(0.636)			(0.262)
Log taxable income	0.537	0.543	0.421	0.330***	0.125***	0.316***
	(0.339)	(0.334)	(0.347)	(0.038)	(0.032)	(0.039)
Implied price elasticity						
Estimate				−0.416	−13.564***	−1.786*
				(0.262)	(0.389)	(1.066)
1st stage information (Excluded instrument: Applicable price)						
F-statistics of instrument			1018.269			990.833
Wu-Hausman test, p-value			0.065			< 0.001
Num.Obs.	6002	6002	6002	24 456	24 456	24 456

Elasticities on Declared Donations

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

	Log donation
	FE
	(1)
Applicable price (β_a)	-0.856
	(0.601)
Log taxable income	0.113
	(0.550)
Num.Obs.	3804

Elasticities of Declaration

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

	1 = Declaration
	FE
	(1)
Applicable price	−0.139**
	(0.057)
Log taxable income	0.264***
	(0.030)
Implied price elasticity	
Estimate	−0.895**
	(0.367)
Num.Obs.	24 456

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)	856	4.907	2.453	0.997	0.996	-0.064	2.452	0.105	0.107	0.124
(B) [1200, 4600)	1415	22.332	15.406	0.967	0.977	1.318	18.485	-2.162	0.283	-2.563
(C) [4600, 8800)	419	43.198	33.174	0.896	0.950	7.218	57.271	-11.845	0.504	-14.040
(D) & (E) [8800, 30000)	92	32.609	29.348	0.886	0.956	11.225	111.293	-18.420	0.467	-21.832
Weighted average						2.109		-3.461		-4.102

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)	−1.090**			−0.076		
	(0.508)			(0.073)		
Effective price (β_e^{FE})		−0.892**			−3.117***	
		(0.359)			(0.105)	
Effective price (β_e^{IV})			−1.558**			−0.289
			(0.734)			(0.270)
Log taxable income	0.454	0.456	0.350	0.327***	0.120***	0.319***
	(0.365)	(0.357)	(0.373)	(0.042)	(0.036)	(0.043)
Implied price elasticity						
Estimate				−0.277	−11.445***	−1.063
				(0.269)	(0.386)	(0.990)
1st stage information (Excluded instrument: Applicable price)						
F-statistics of instrument			739.508			712.079
Wu-Hausman test, p-value						
Num.Obs.	4213	4213	4213	15 469	15 469	15 469

Elasticities on Declared Donations

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

	Log donation
	FE
	(1)
Applicable price (β_a)	-0.797
	(0.689)
Log taxable income	0.020
	(0.532)
Num.Obs.	2889

Elasticities of Declaration

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

	1 = Declaration
	FE
	(1)
Applicable price	−0.119*
	(0.069)
Log taxable income	0.262***
	(0.034)
Implied price elasticity	
Estimate	−0.636*
	(0.371)
Num.Obs.	15 469

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)	345	5.507	3.188	0.997	0.995	-0.141	2.781	0.203	0.107	0.174
(B) [1200, 4600)	1003	22.034	14.756	0.967	0.978	1.358	18.738	-1.959	0.270	-1.682
(C) [4600, 8800)	368	41.848	32.337	0.900	0.951	6.962	53.407	-10.039	0.489	-8.618
(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						2.705		-3.901		-3.349

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   7.034   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)	−1.543**			0.033		
	(0.680)			(0.057)		
Effective price (β_e^{FE})		−1.046**			−2.127***	
		(0.460)			(0.097)	
Effective price (β_e^{IV})			−2.164**			0.142
			(0.956)			(0.248)
Log taxable income	0.081	0.107	−0.106	0.223***	0.076***	0.227***
	(0.559)	(0.550)	(0.578)	(0.030)	(0.026)	(0.034)
Implied price elasticity						
Estimate				0.230	−14.854***	0.989
				(0.398)	(0.675)	(1.728)
1st stage information (Excluded instrument: Applicable price)						
F-statistics of instrument			592.080			990.833
Wu-Hausman test, p-value			0.081			< 0.001
Num.Obs.	3503	3503	3503	24 456	24 456	24 456

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)	-1.232
	(0.895)
Log taxable income	-0.007
	(0.826)
Num.Obs.	2551

Results of New Study Sample A (3)

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

	1 = Declaration
	FE
	(1)
Applicable price	−0.139**
	(0.057)
Log taxable income	0.264***
	(0.030)
Implied price elasticity	
Estimate	−0.895**
	(0.367)
Num.Obs.	24 456

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)	856	4.907	2.453	0.997	0.996	-0.064	1.100	0.111	0.062	-0.095
(B) [1200, 4600)	1415	22.332	15.406	0.967	0.977	1.318	8.044	-2.303	0.190	1.969
(C) [4600, 8800)	419	43.198	33.174	0.896	0.950	7.218	23.205	-12.618	0.337	10.784
(D) & (E) [8800, 30000)	92	32.609	29.348	0.886	0.956	11.225	33.674	-19.621	0.272	16.770
Weighted average						2.109		-3.686		3.151

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   8.642   0.000 800.000
```

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)	−1.729**			0.047		
	(0.796)			(0.067)		
Effective price (β_e^{FE})		−0.942*			−1.963***	
		(0.497)			(0.105)	
Effective price (β_e^{IV})			−2.358**			0.181
			(1.094)			(0.262)
Log taxable income	0.015	0.095	−0.162	0.223***	0.077**	0.228***
	(0.585)	(0.569)	(0.603)	(0.035)	(0.032)	(0.039)
Implied price elasticity						
Estimate				0.283	−11.780***	1.085
				(0.405)	(0.633)	(1.574)
1st stage information (Excluded instrument: Applicable price)						
F-statistics of instrument			452.140			712.079
Wu-Hausman test, p-value						
Num.Obs.	2577	2577	2577	15 469	15 469	15 469

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)	-1.624
	(1.046)
Log taxable income	-0.299
	(0.927)
Num.Obs.	1943

Results of New Study Sample B (3)

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

	1 = Declaration
	FE
	(1)
Applicable price	−0.119*
	(0.069)
Log taxable income	0.262***
	(0.034)
Implied price elasticity	
Estimate	−0.636*
	(0.371)
Num.Obs.	15 469

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)	345	5.507	3.188	0.997	0.995	-0.141	1.237	0.254	0.067	-0.193
(B) [1200, 4600)	1003	22.034	14.756	0.967	0.978	1.358	8.423	-2.457	0.189	1.861
(C) [4600, 8800)	368	41.848	32.337	0.900	0.951	6.962	20.546	-12.593	0.332	9.537
(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						2.705		-4.894		3.706