

Econ 2230: Public Economics

Lecture 21: Subsidizing giving

Subsidizing charitable giving

1. Tax subsidy

- a) Characterizing the US deduction for charitable donations
- b) Optimal subsidy
- c) Intended and unintended consequences
- d) Price elasticity of giving
- e) Salience

2. Matching

- a. Difference between subsidy versus match
- b. Price elasticity of giving under match
- c. Reconciling response from experimental and non-experimental data



1a. Tax subsidy for charitable giving

- ▶ Deductions of charitable giving:
 - ▶ Individuals can deduct the value of contributions to non-profits
 - ▶ Gifts of property are deductible but services are not
 - ▶ Deductions can not exceed 50% of adjusted gross income
 - ▶ Deduction only given to those who itemize
 - ▶ One of the largest tax expenditures of the US government 2005 deductions of nearly \$200 billion



■ TABLE 18-2

**Top 10 U.S. Federal Government Tax Expenditures
(projected for 2007)**

Major categories of tax expenditures

Exclusion of employer contributions for medical insurance	\$146.8
Deductibility of home mortgage interest	79.9
Exclusion of pension contributions and earnings: employer plans	52.5
Child credit	42.1
Exclusion of pension contributions and earnings: 401(k) plans	39.8
Deductibility of charitable contributions	34.5
Preferential treatment of capital gains income	32.5
Deductibility of state and local taxes	29.6
Exclusion of interest on state and local bonds	29.6
Exclusion of interest on life insurance savings	20.8
Total of all tax expenditures	\$871.8

Tax Expenditure Comparisons

	Value (in billions of \$)	Ratio
Tax expenditures/tax receipts	\$872/\$1,516	0.56
Tax expenditures/federal deficit	\$872/\$270	3.2

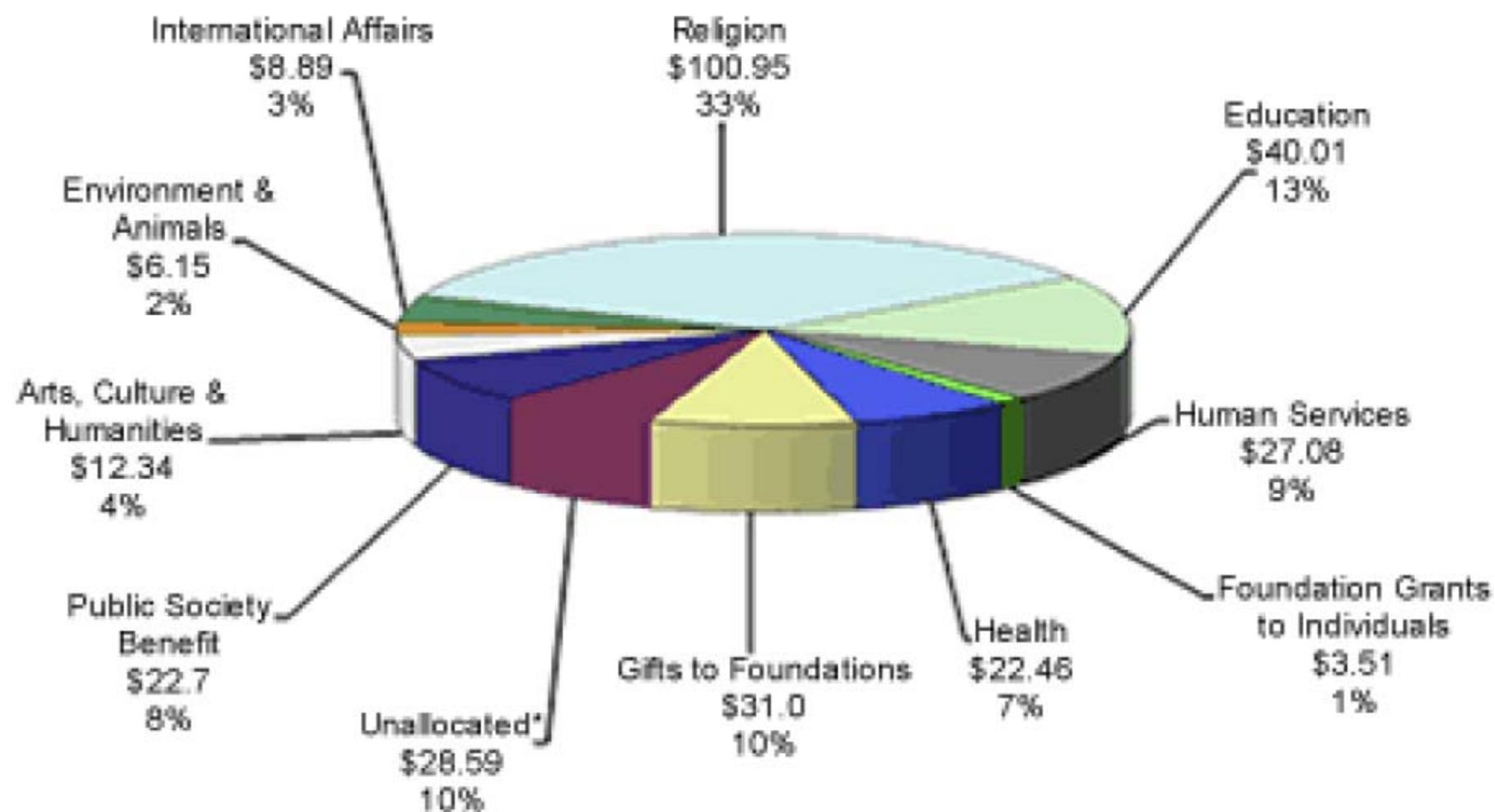
In 2007, the government will lose \$871.8 billion in revenue because of various exclusions and credits in the tax code. The largest such tax expenditures are shown here; the most important tax exclusions are those that favor employer contributions to health insurance and pension plans.

1a. Tax subsidy for charitable giving

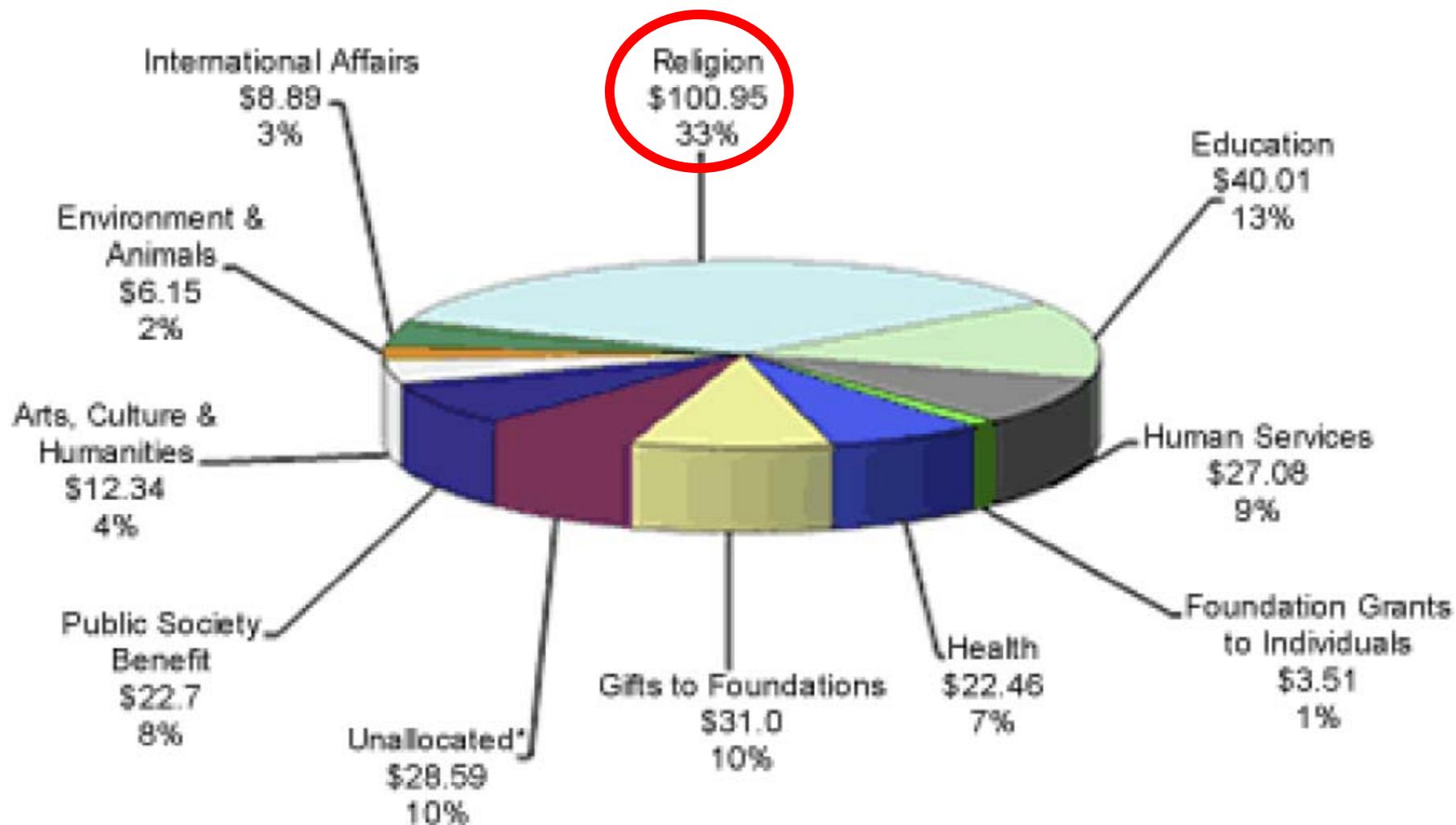
- ▶ Why provide deductions for charitable giving?
 - ▶ Positive externalities associated with charitable giving. Can reduce problem by offering a subsidy
 - ▶ “Enables government support to organizations that they otherwise are prevented from supporting”
- ▶ What is the government funding through the subsidy?



2009 CONTRIBUTIONS: \$307.75 billion by type of recipient organization (\$ in billions - All figures are rounded)



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1.b. Subsidizing charitable giving

- ▶ Theoretical questions:
 - ▶ Should we have such a subsidy?
 - ▶ How large should such a subsidy be?
 - ▶ What are the key determinants of the optimal subsidy?

- ▶ Saez (2004): Optimal level of subsidies depends on four factors:
 1. The price elasticity of the contribution good; the optimal subsidy should rise with the price elasticity
 2. Size of externality associated with provision (particularly important for public goods the government cannot fund)
 3. Crowding out: subsidy should be greater for goods for which private donations are crowded out by public provision
 4. Redistribution: contributions concentrated at the bottom of the income distribution should be subsidized more heavily than those concentrated at the top



1.b. Optimal subsidy

- ▶ Let
 - ▶ θ - deductibility of charitable giving
 - ▶ τ - tax rate
 - ▶ $1 - \tau\theta$ - price of giving \$1 to charity
- ▶ Individual maximizes (warm-glow)
 - ▶ $U(c, g)$
 - ▶ s.t. $c + g = y + \tau(y - \theta g)$

- ▶ Let β denote price elasticity of giving:

$$\beta = \frac{1 - \theta\tau}{g} \frac{\partial g}{\partial (1 - \theta\tau)}$$

- ▶ Let γ denote income elasticity of giving:

$$\gamma = \frac{y}{g} \frac{\partial g}{\partial y}$$



One public good

- ▶ Case 1: Public good can be provided through tax revenue or through voluntary provision
- ▶ Let P denote funding for public good
 - ▶ $P = \tau(y - \theta g) + g = \tau y + (1 - \theta\tau)g$
- ▶ Under what conditions should a tax subsidy be offered to individuals?
 - ▶ $\frac{dP}{d\theta} = -\tau g + \frac{dg}{d\theta} (1 - \theta\tau)$
 - ▶ $\frac{dP}{d\theta} = -\tau g + \frac{dg}{d\theta} \frac{1-\theta\tau}{g} g$
 - ▶ $\frac{dg}{d(1-\theta\tau)} = -\frac{dg}{d\theta} \tau$
 - ▶ $\frac{dP}{d\theta} = -\tau g - \frac{dg}{d(1-\theta\tau)} \frac{1-\theta\tau}{g} \tau g$
 - ▶ $\frac{dP}{d\theta} = -\tau g - \beta \tau g = -\tau g (1 + \beta)$
 - ▶ Therefore $\beta < -1$ implies $\frac{dP}{d\theta} > 0$
- ▶ Thus desirable to subsidize up to point where $\beta(\theta) = -1$
- ▶ For $\beta < -1$ the subsidy will generate more additional giving to charity than the amount of foregone tax revenue



Optimal subsidy

- ▶ Suppose two public goods: private donations fund one, government revenue funds another public good
 - ▶ Subsidy may be justifiable if external benefit of privately funded charity exceed those of the public good provided by the government
 - ▶ Equivalent to saying marginal value of charitable good (λ) greater than public good

- ▶ Criteria:
 1. λ - externality of provision
 2. β - price elasticity of giving
 3. Crowding out
 4. Redistribution
 5. Other factors?



1.c. Unintended consequences

- ▶ Is it sufficient to consider the response in giving?
- ▶ Gruber (2004)
 - ▶ “Pay or pray? The impact of charitable subsidies on religious attendance”
 - ▶ Examine effect of subsidy on religiosity (giving and participation)
- ▶ Justification for religious subsidy
 - ▶ Religious organizations provide transfers to low income
 - ▶ Provide low income an opportunity to attend religious services
 - ▶ Government prevented from direct support
- ▶ How does the tax subsidy influence giving and religious participation? If subsidy decreases attendance then may reduce the externalities the subsidy was thought to have.



1.c. Unintended consequences (Gruber, 2004)

- ▶ Theory: giving and attending
 - ▶ Substitutes (Azzi and Ehrenber, 1975)
 - ▶ Individuals allocate resources between religious and secular commodities to maximize lifetime and ‘afterlife’ utility
 - ▶ Complements
 - ▶ Need to attend to give. Warm glow relies on visibility
- ▶ Empirical evidence:
 - ▶ Complements: positive correlation between attendance and contributions (e.g., Olson and Caddell, 1994). Omitted variable?
 - ▶ Substitutes: United Church of Christ congregations, the congregations with the highest per capita financial giving were the congregations that were losing members most rapidly (Olson and Caddell, 1994). Omitted variable ?



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 - ▶ Substitutes: United Church of Christ congregations, the congregations with the highest per capita financial giving were the congregations that were losing members most rapidly (Olson and Caddell, 1994). Omitted variable ? natural life cycle, those that remain are those most dedicated.



1.c. Unintended consequences (Gruber, 2004)

- ▶ Exploit variation in the subsidization over time, across income groups, across states to identify effect of subsidy on giving and attending
- ▶ General Social Survey, nationally representative sample since 1972, on religious attendance
- ▶ Consumer Expenditure Survey (CEX) nationally representative sample on giving activity
- ▶ TAXSIM to calculate deductions (It allows one to calculate federal and state income tax liabilities from survey data)



Gruber (2004) finding

Table 2
Impact of charitable subsidies on charitable giving in CEX

	Religious giving			Total giving		
	Level	Log	Giving>0	Level	Log	Giving>0
Subsidy	204 (87)	0.502 (0.176)	0.001 (0.042)	519 (102)	0.878 (0.162)	0.143 (0.046)
Elasticity wrt after-tax price	-0.47	-0.47	0	-0.88	-0.80	-0.24
White	114 (21.3)	.296 (.049)	0.009 (0.011)	185 (24.9)	0.253 (0.044)	0.052 (0.011)
Black	175 (23.9)	0.384 (0.054)	0.067 (0.012)	224 (28.0)	0.423 (0.050)	0.051 (0.012)
Married	-249 (33.1)	-0.146 (.074)	-0.056 (0.016)	-420 (38.7)	-0.288 (0.069)	-0.108 (0.017)
HS graduate	105 (11.2)	0.288 (0.025)	0.049 (0.006)	147 (13.2)	0.267 (0.024)	0.077 (0.006)
Some college	171 (12.6)	0.375 (0.028)	0.107 (0.006)	240 (14.8)	0.444 (0.026)	0.142 (0.006)
College graduate	274 (13.2)	0.536 (0.029)	0.147 (0.007)	446 (15.5)	0.760 (0.027)	0.186 (0.006)



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Table 3

Impact of charitable subsidies on religious participation in GSS

Subsidy

Elasticity wrt after-tax price

White

Black

Married

HS graduate

Some college

College graduate

Income category 2

Income category 3

Income category 4

Income category 5

Income category 6

Income category 7

Income category 8

Income category 9

Income category 10

Number of observations

Standard errors in parentheses. Dependent variable is attendance index. Regressions also include cc and sex of respondent; education of mother and father; number of children; and state and year. Elasticity computed with respect to after-tax price of giving.

1.c. Unintended consequences

- ▶ Gruber (2004)
 - ▶ 1% increase in religious giving decreases religious participation by 1.1%
 - ▶ Crucial to evaluate the overall welfare effects of extending deductions to religious giving
- ▶ May not be sufficient to examine price elasticity if the objective is to achieve certain external effects



1.d. How responsive is giving to the price of giving?

- ▶ Prince and File 1994,
 - ▶ survey of 200 big donors
 - ▶ “awareness of tax advantages” was ranked the third most important motivator for making a charitable donation
- ▶ Aggregate data
 - ▶ despite substantial changes in the marginal tax rates during the 1980's the share of income donated remained fairly constant.
 - ▶ suggest little if any response to price changes.
 - ▶ Look at subgroups:
 - ▶ Look at those for whom the price of giving increased and those for whom it decreased



1.d. Are deductions “treasury efficient”? $\beta = -1$

- ▶ Cross-sectional data:
 - ▶ Existing studies have estimated price elasticity β and γ income elasticity
 - ▶ $\log(g) = \alpha + \beta \log(1 - t) + \gamma \log y + \varepsilon$
- ▶ Cross sectional results
 - ▶ $\gamma = 0.8, \beta = -1.3$. (Feldstein and Taylor 1976, Clotfelter 1985)
 - ▶ General cross sectional results $-1.75 < \beta < -0.5$
- ▶ Problem with cross sectional data?



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- ▶ Problem with cross sectional data?
 - ▶ difficult to separately identify the effect of changes in income from that of prices. Since the marginal tax rate increases with income, one cannot determine whether a positive correlation between giving and income is caused by people giving more when they face a higher income or when they face a lower price.



1.d. Are deductions “treasury efficient”? $\beta = -1$

- ▶ Panel data:
- ▶ Randolph (1995):
 - ▶ 10-year panel of tax-return data
 - ▶ 1979-88: period with two major tax reforms
 - ▶ Income elasticity: larger in the long-term than in the short-term. Limited response to temporary changes in income
- ▶ Price elasticity:
 - ▶ donors time their giving to take advantage of temporary changes in the tax prices, whereas permanent changes in price have a small effect.
 - ▶ Finds short-term elasticities: 1.2; long-term elasticities: 0.6
 - ▶ Concern that tax incentives merely affect the timing of giving rather than, as intended, the level of giving.



1.d. Are deductions “treasury efficient”? $\beta=-1$

- ▶ Auten, Sieg and Clotfelter (2002)
 - ▶ use a similar (although longer) panel of tax payers, but employ a different estimation technique.
 - ▶ Analysis capitalizes on restrictions placed on the covariance matrices of income and price by assumptions of the permanent income hypothesis
 - ▶ Confirm finding that the permanent income elasticity exceeds that of the temporary one.
 - ▶ Permanent price elasticity of -1.26 (very small temporary effect)



1.d. Are deductions “treasury efficient”? $\beta=-1$

- ▶ Bakija and Heim (2010)
 - ▶ Follow on strand on papers trying to account for anticipated permanent changes in tax law. This literature typically finds small persistent price elasticities and larger transitory price elasticities, but with wide confidence intervals.
 - ▶ Panel of over 550,000 disproportionately high-income tax returns (1979-2005)
 - ▶ Deals with expectations; allowing people at different income levels to have different degrees responsiveness to taxation and different time paths of unobservable influences on giving
 - ▶ Permanent price elasticity -0.7



1.d. Are deductions “treasury efficient”? $\beta=-1$

- ▶ The sensitivity of the estimates to the estimation technique and the identification strategy has left the literature unsettled as to the true values of price and income elasticities
- ▶ Are there ways in which we could increase response to the subsidy?
- ▶ Is the deduction salient?



1.e. Saliency

- ▶ Response to taxes and subsidies depend on how salient they are
- ▶ People are not fully aware of the taxes they face?
- ▶ Chetty, Looney, and Kroft (2009) test this assumption and generalize theory to allow for saliency effects
- ▶ Test whether saliency (visibility of tax-inclusive price) affects behavioral responses to commodity taxation
 - ▶ Does effect of a tax on demand depend on whether it is included in posted price?
 - ▶ Experiment
 - ▶ Non-experimental data



Chetty, Looney, and Kroft (2009)

- ▶ Experiment
 - ▶ manipulating salience of sales tax implemented at a supermarket that belongs to a major grocery chain
 - ▶ 30% of products sold in store are subject to sales tax
 - ▶ Posted tax-inclusive prices on shelf for subset of products subject to sales tax (7.375% in this city)
 - ▶ Data: Scanner data on price and weekly quantity sold by product



Classroom survey

- ▶ Individuals are aware of the magnitude of the sales tax
- ▶ Students were asked to choose two items from image
- ▶ Asked to report “Total bill due at the register for these two items”

TABLE 1
Evaluation of Tags: Classroom Survey

	Mean	Median	SD
Original Price Tags:			
Correct tax-inclusive price w/in \$0.25	0.18	0.00	0.39
Experimental Price Tags:			
Correct tax-inclusive price w/in \$0.25	0.75	1.00	0.43
T-test for equality of means: $p < 0.001$			
N=49			



Field experiment

- ▶ Quasi-experimental difference-in-differences
- ▶ Treatment group:
 - ▶ Products: Cosmetics, Deodorants, and Hair Care Accessories (relatively high price and high price elasticity)
 - ▶ Store: One large store in Northern California
 - ▶ Time period: 3 weeks (February 22, 2006 - March 15, 2006)
- ▶ Control groups:
 - ▶ Products: Other prods. in same aisle (toothpaste, skin care, shave) of the store
 - ▶ Stores: same products at two nearby stores similar in demographic characteristics
 - ▶ Time period: prior to intervention calendar year 2005 and first 6 weeks of 2006



Chetty, Looney, and Kroft (2009)

Effect of Posting Tax-Inclusive Prices: Mean Quantity Sold

	TREATMENT STORE	
Period	<u>Control</u>	<u>Categories</u>
Baseline	26.48	(0.22)
Experiment	27.32	(0.87)
Difference over time	0.84	(0.75)



Chetty, Looney, and Kroft (2009)

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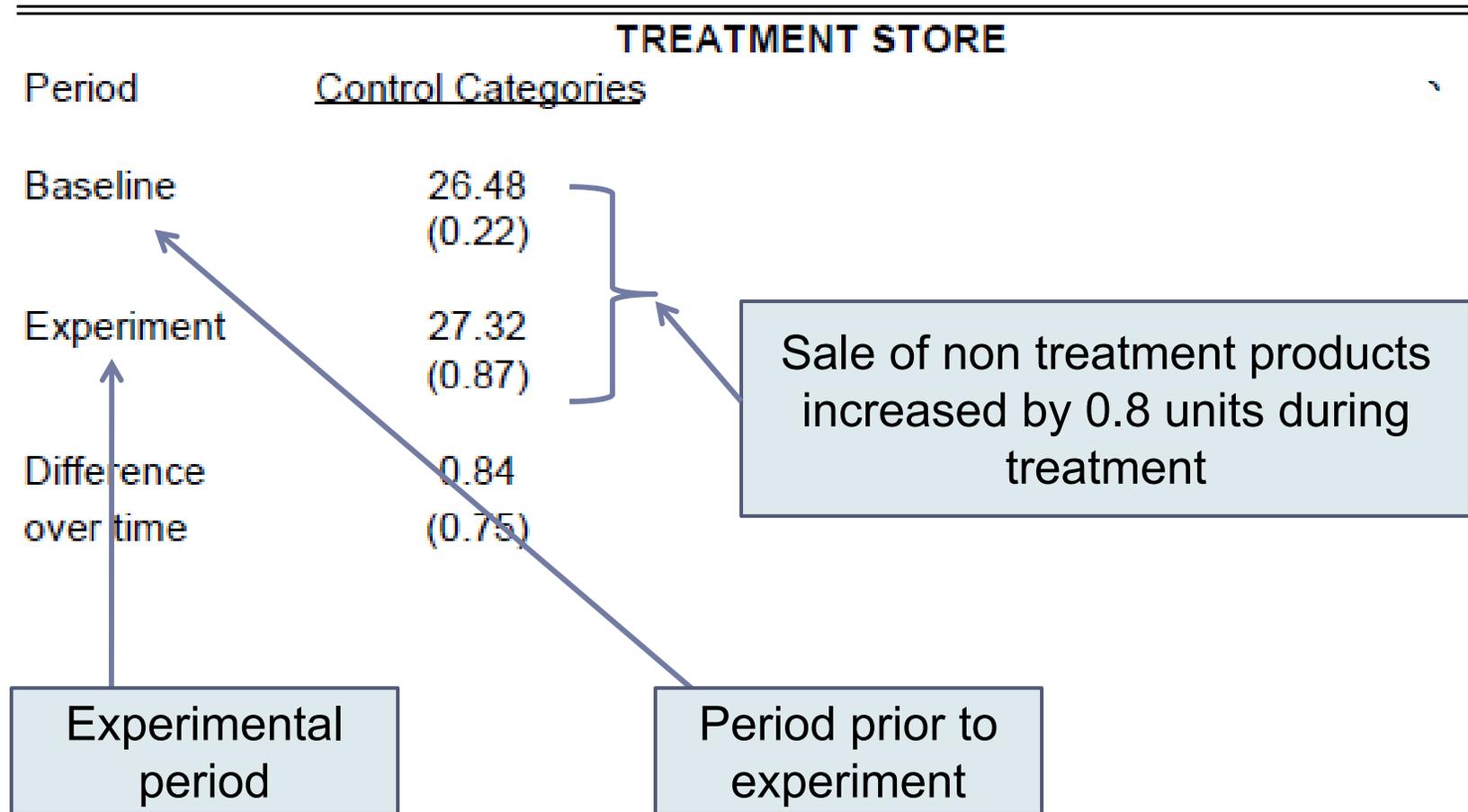
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Experimental period

Period prior to experiment

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Difference over time	0.84 (0.75)	-1.30 (0.92)



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Experiment	27.32 (0.87)	23.87 (1.02)	-3.45 (0.64)
Difference over time	0.84 (0.75)	-1.30 (0.92)	DD_{TS} = -2.14 (0.64)



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Baseline	30.57 (0.24)	27.94 (0.30)	-2.63 (0.32)
Experiment	30.76 (0.72)	28.19 (1.06)	-2.57 (1.09)
Difference over time	0.19 (0.64)	0.25 (0.92)	DD_{Cs} = 0.06 (0.90)



Chetty, Looney, and Kroft (2009)

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		DDD Estimate	-2.20 (0.58)

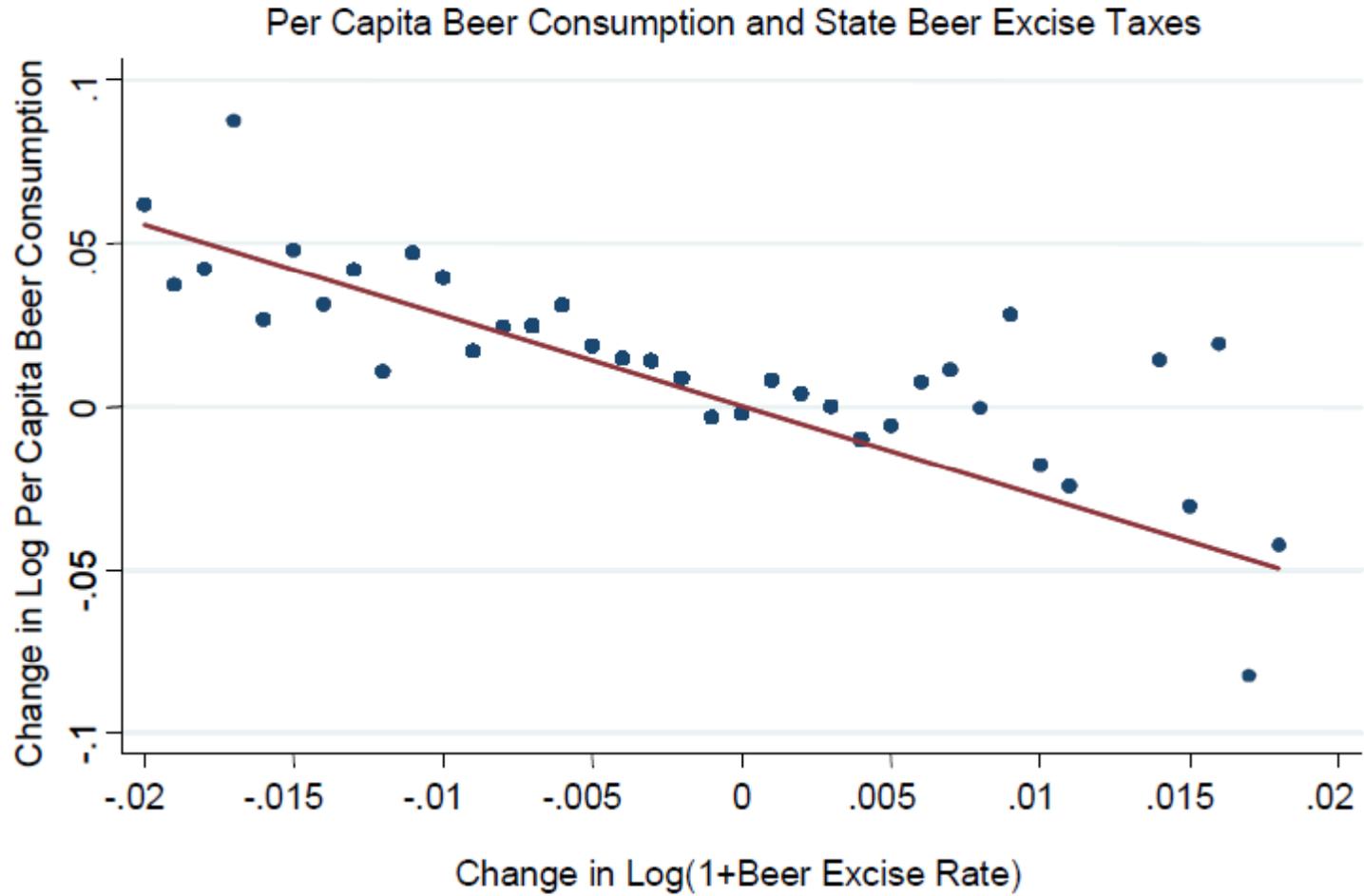


Chetty, Looney, and Kroft (2009)

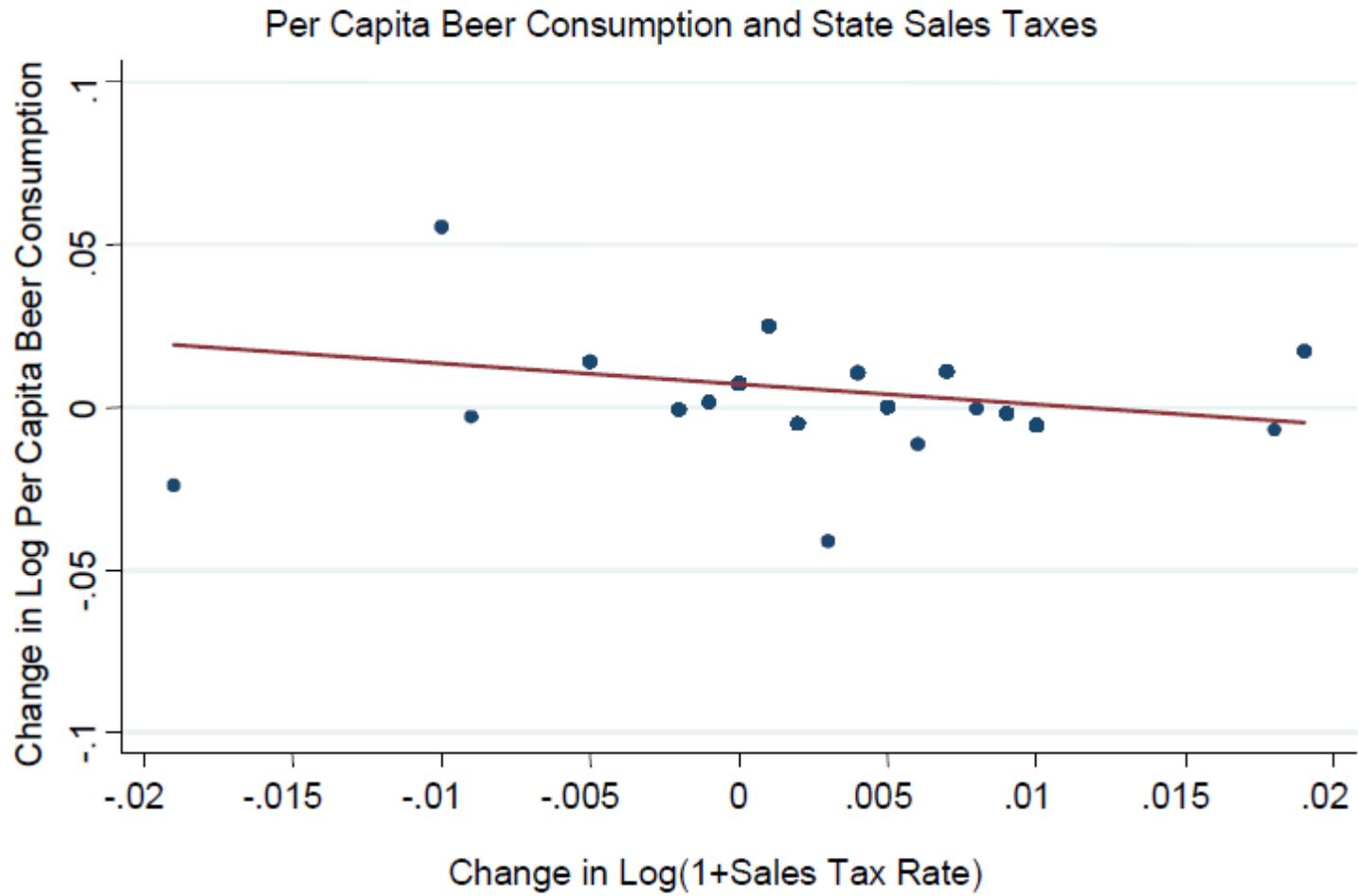
- ▶ Evaluate response
 - ▶ Posting tax inclusive prices decreases demand by 8%
 - ▶ Price elasticity of demand range from 1 to 1.5
 - ▶ Tax-inclusive price reduced demand by nearly same amount as a 7.375 percent price increase
 - ▶ Vast majority of customers do not take sales tax into account
- ▶ Non-experimental data
 - ▶ Compare effects of price changes and tax changes
 - ▶ Alcohol subject to two state-level taxes in the U.S.:
 - ▶ Excise tax: included in price
 - ▶ Sales tax: added at register, not shown in posted price
 - ▶ Exploiting state-level changes in these two taxes



Chetty, Looney, and Kroft (2009)



Chetty, Looney, and Kroft (2009)



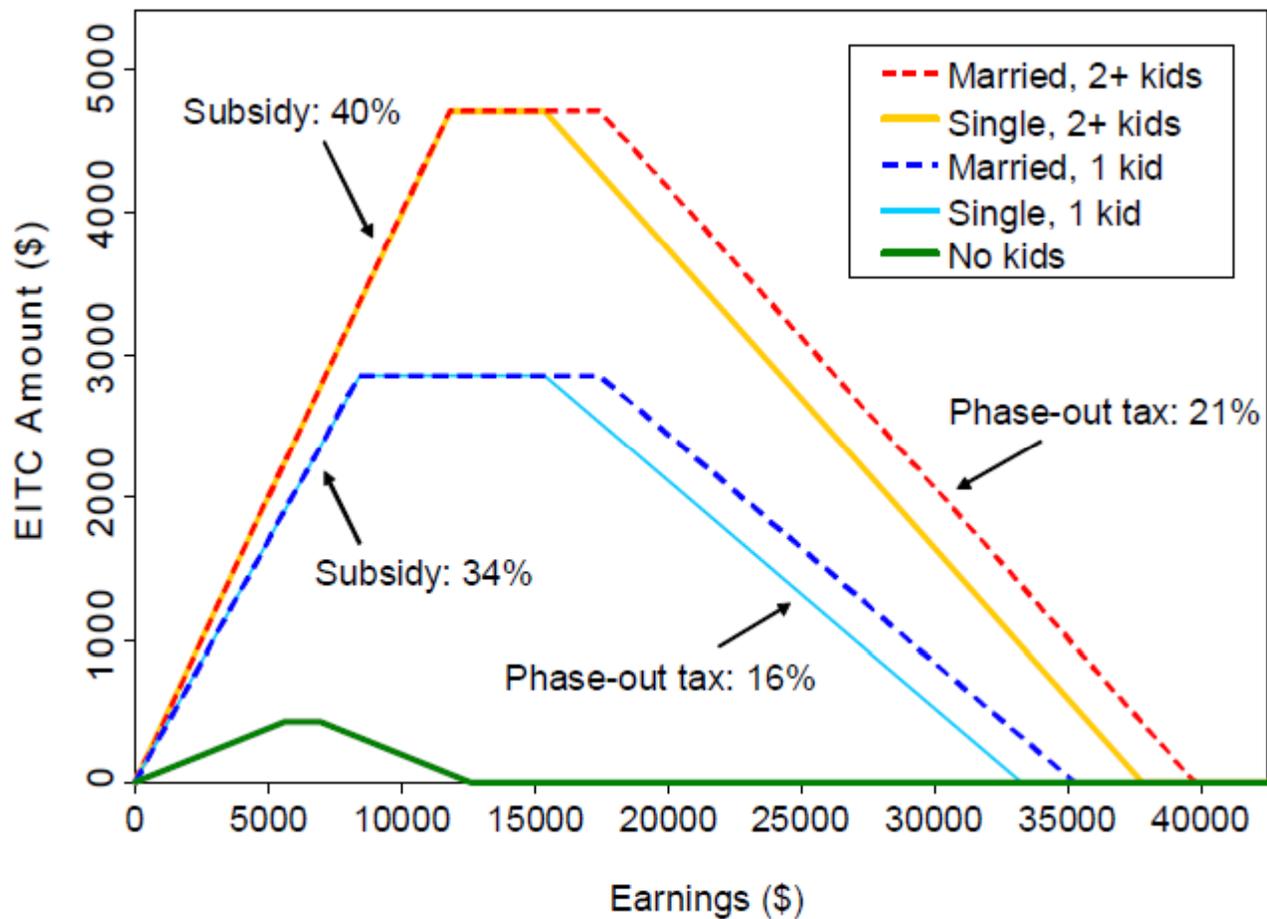
Chetty and Saez, 2009

- ▶ Salience of income taxation
- ▶ Examine Earned Income Tax Credit (EITC)
 - ▶ The EITC is the largest cash transfer program for low income families in the United States and it generates large marginal subsidies or taxes on the earnings of recipients.
 - ▶ A refundable tax credit primarily for individuals and couples with qualifying children.
 - ▶ For tax year 2010:
 - ▶ maximum EIC for a person or couple without qualifying children is \$457
 - ▶ with one qualifying child is \$3,050
 - ▶ with two qualifying children is \$5,036
 - ▶ with three or more qualifying children is \$5,666



FIGURE I
The Earned Income Tax Credit Schedule

a) EITC Amount as a Function of Earnings



Chetty and Saez, 2009

- ▶ 119 H&R Block offices in Chicago metro area; 43,000 EITC clients
- ▶ 1,461 tax professionals implemented experiment
- ▶ Tax Season 2007: Jan. 1 to April 15, 2007
- ▶ EITC clients randomly assigned to control or treatment group

- ▶ Control group:
 - ▶ standard tax preparation procedure
 - ▶ Only mentions the EITC amount, with no info on EITC structure

- ▶ Treatment



Explaining EIC: 4 steps

Single With Two or More Children

The EIC (Earned Income Credit) is a tax refund that gives families as much as \$4,500 per year.

We want to explain how the EIC works to help you decide how much to work and earn this year. In 2006, you made \$ **10,000** → you are getting an EIC of \$ **4,000** in your refund.

- Your earnings this year (in 2007) will determine the size of your EIC refund next year
- The EIC has 3 ranges: 1) Increasing, 2) Peak, 3) Decreasing

You are in the **increasing** range of the EIC. Think about it like this:

- (increasing) Suppose you earn \$10 an hour, then you are really making \$14.00 an hour.
- (peak) Your earnings are making-out the EIC amount
- (decreasing) If you earn \$10 more, your EIC is reduced by \$2.10

EIC Range	If you earn between	EIC refund will be	If you earn \$10 more, the EIC...
Increasing	\$0-\$11,790	\$0 up to \$4,716	Increases by \$4
Peak	\$11,790-\$15,390	\$4,716	Stays the same
Decreasing	\$15,390-\$37,780	\$4,716 down to \$0	Decreases by \$2.10

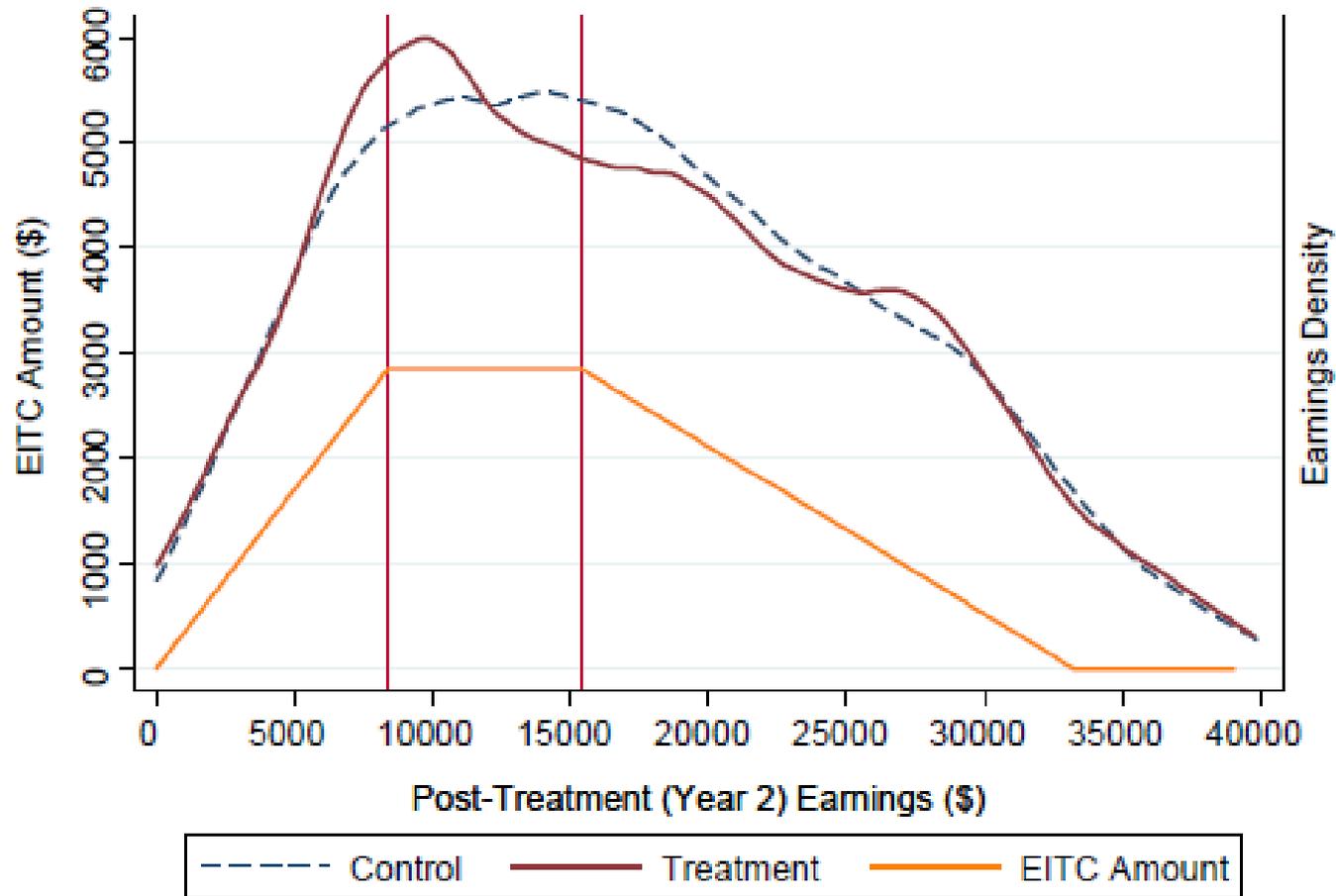
1. Fill in earnings, EIC amount

2. Explain and dot graph

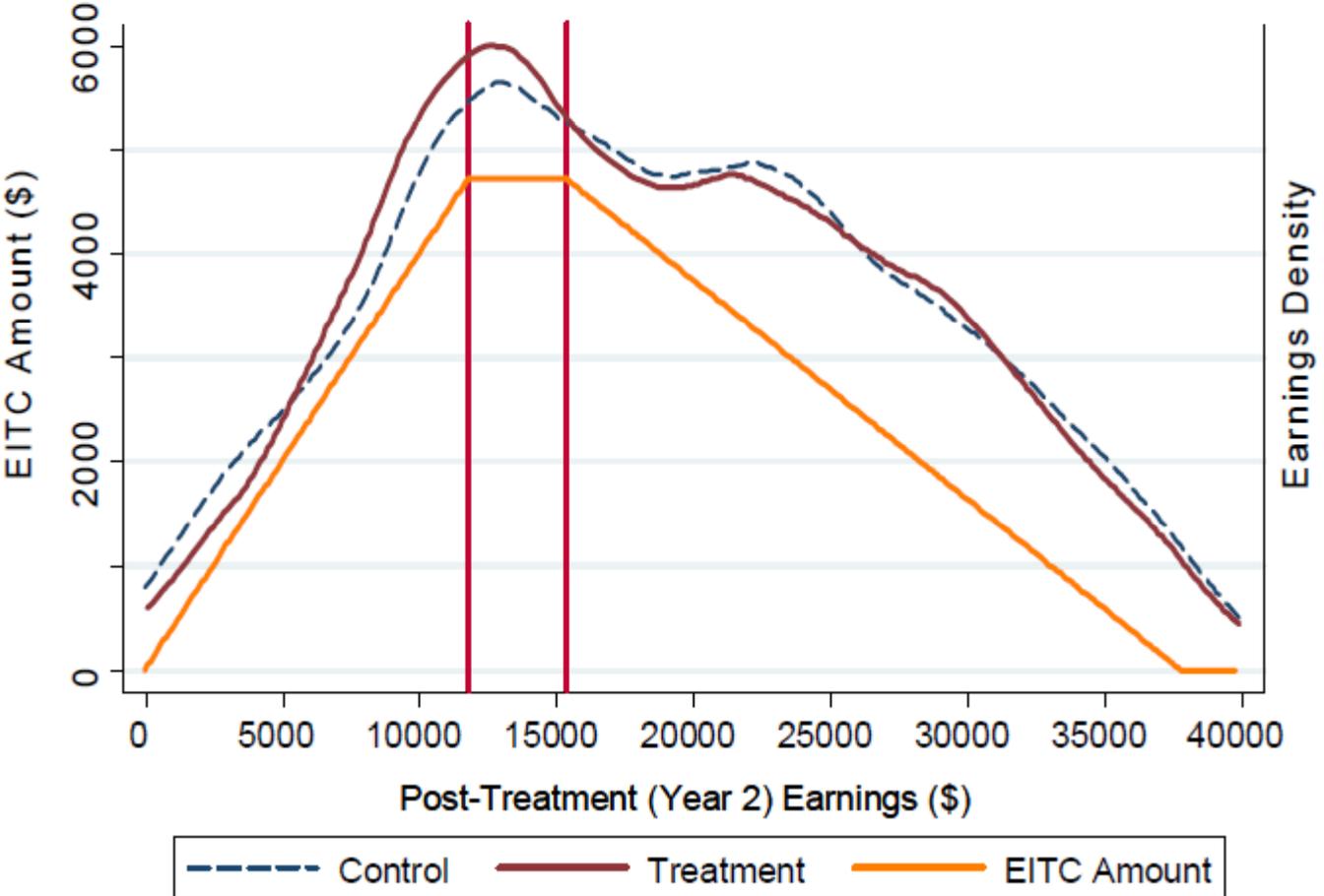
4. Take-home Message

3. Table

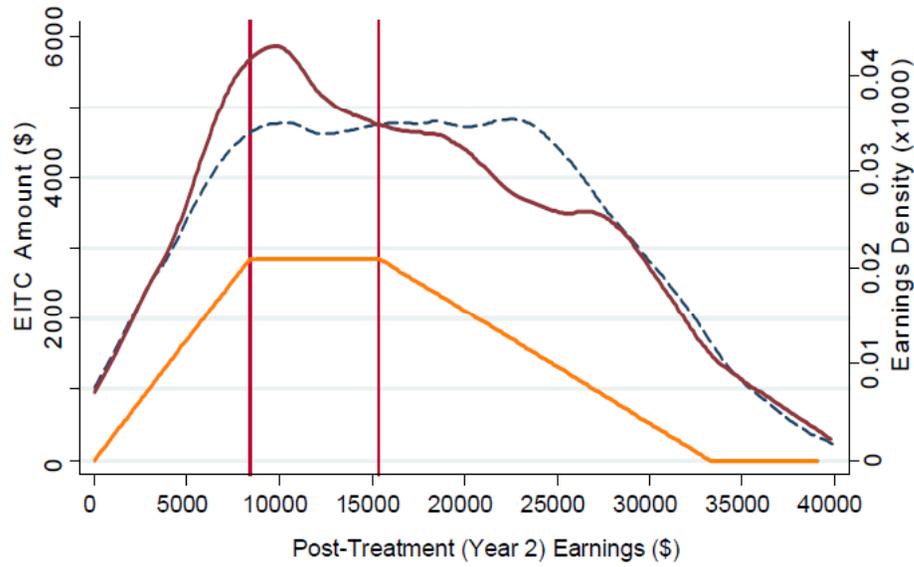
Year 2 Earnings Distributions: 1 Dep., Clients of Complying Tax Preparers



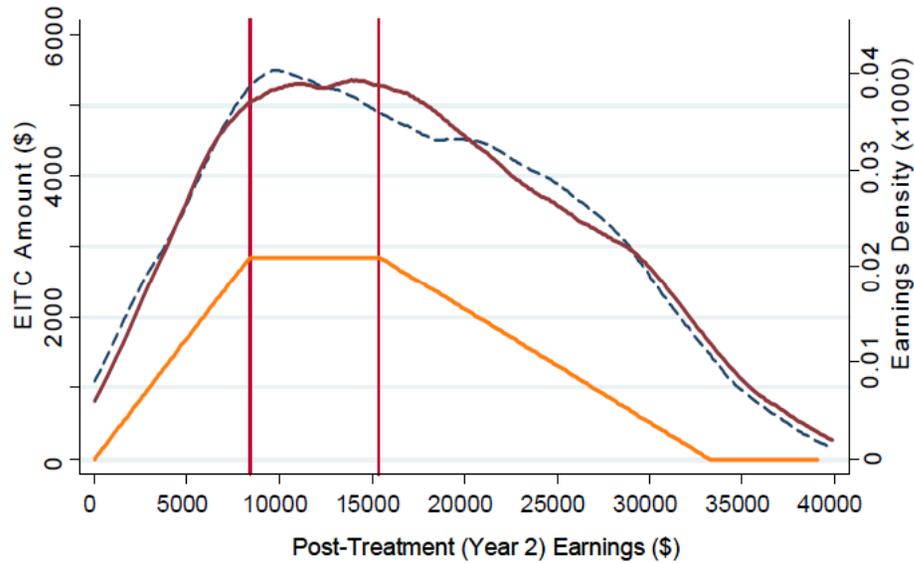
b) 2+ Dependents



a) 1 Dependent, Treatment Group

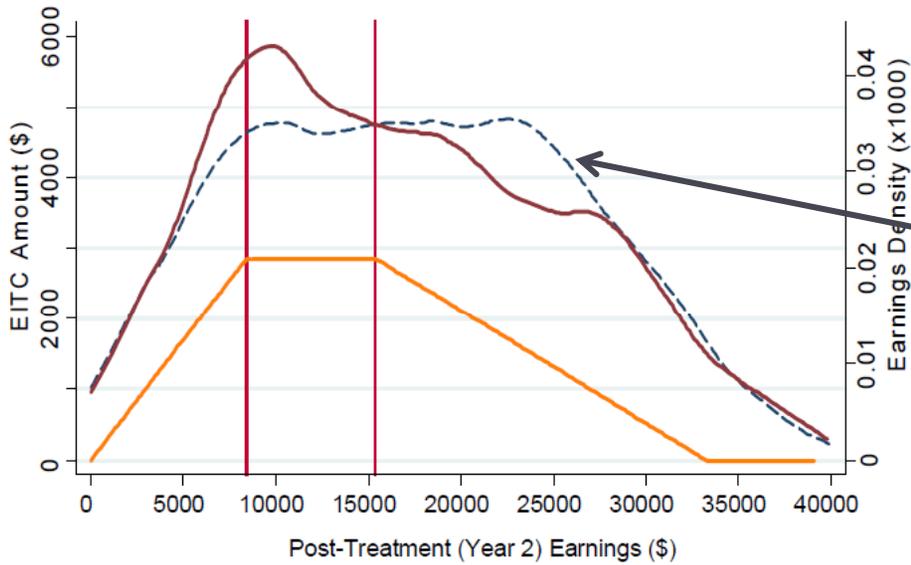


b) 1 Dependent, Control Group



--- Non-Complying Tax Pros --- Complying Tax Pros --- EITC Amount

a) 1 Dependent, Treatment Group



One potential explanation for this response is that the non-compliers are tax professionals who framed the EITC incentive effects as being small relative to the benefits of earning a higher income

b) 1 Dependent, Control Group



--- Non-Complying Tax Pros --- Complying Tax Pros --- EITC Amount

1.e. Saliency

- ▶ Saliency plays a key role in determining response to taxation or subsidies
- ▶ Accounting for the limited saliency Thaler and Sunstein (2008) propose a Charity Debit Card
 - ▶ Can be used only for charitable donations
 - ▶ Provides statement on deduction
 - ▶ Summary statement sent straight to IRS for deductions
- ▶ One way of determining response to salient tax deductions is the lab



2. Matching

- ▶ Government provided incentives typically provided in the form of deductions. Private incentives in the form of matches

- ▶ Experimental evidence typically examine matches. Attraction is that cost salient in experimental studies
 - a. Are rebates and subsidies equivalent?
 - ▶ Eckel and Grossman (2003)
 - b. How does the magnitude of the match influence giving?
 - ▶ Meier (2007)
 - ▶ Karlan and List (2007), Karlan, List, and Shafir (2010)
 - c. Reconciling evidence from experimental and non-experimental data



Next:

- ▶ *Matching*
 - ▶ *Groups: Norms, Institutions and sorting:*
 - ▶ Elinor Ostrom, *Governing the Commons*, chapter 3, *Governing the Commons: The Evolution of Institutions for Collective Action*
 - ▶ Theodore Bergstrom, The Uncommon Insight of Elinor Ostrom, *Scandinavian Journal of Economics*, 2010
 - ▶ Ahn, T.K., Mark Isaac and Timothy C. Salmon. Coming and Going: Experiments on Endogenous Group Sizes for Excludable Public Goods. *Journal of Public Economics*, Vol. 93, No. 1-2 (2009): 336-351.
 - ▶ Ahn, T.K., Mark Isaac and Timothy C. Salmon. Endogenous Group Formation, *Journal of Public Economic Theory*, Vol 10. No. 2 (2008) 171-194.
 - ▶ Sutter, Matthias, Stefan D. Haigner, and Martin G. Kocher. 2009. "Choosing the Carrot or the Stick? – Endogenous Institutional Choice in Social Dilemma Situations."
 - ▶ Cinyabuguma, Matthias, Talbot Page, and Louis Putterman. 2005. "Cooperation under the Threat of Expulsion in a Public Goods Experiment." *Journal of Public Economics*, 89: 1421-1435.
 - ▶ Ehrhart, Karl-Martin, and Claudia Keser. 1999. "Mobility and Cooperation: On the Run."
 - ▶ Gülerk, Özgür, Bernd Irlenbusch, and Bettina Rockenbach. 2006. "The Competitive Advantage of Sanctioning Institutions." *Science*, 312(5770): 108-111.
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