Fiscal Policy and Inequality

7. Tax Incidence – Experimental Evidence

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Economic vs Statutory incidence

- Statutory incidence: "companies will pay a 30% tax on profits"
- Economic incidence: How does this change affect shareholders, workers?
  - Empirical question
- If prices did not change, then statutory and economic incidence would be the same
  - However, prices usually respond to tax changes

Slemrod (NTJ, 2008): The Importance of Tax Remittance

- Does it matter who writes the check to the government?
  - According to standard economic theory: no. "Irrelevance proposition".
  - In practice: yes, it usually matters.

Slemrod (NTJ, 2008): The Importance of Tax Remittance

- Reasons for failure of the irrelevance proposition:
  - Taxpayers face compliance costs
    - Time spent filling out tax forms, money spent on accountants, etc.
    - May be somewhat related to statutory tax incidence
  - Governments face administrative costs
    - Managing tax system, tax enforcement efforts
- How compliance/administrative costs of taxation are allocated will affect the overall incidence of taxation

Slemrod (NTJ, 2008): The Importance of Tax Remittance

- Firms play a key role in modern tax systems:
  - Governments rely on them for tax remittance, even for taxes that are born by other agents
  - Leading example is income tax **withholding.** Firms keep a fraction of employees' wage and remit it directly to the government
  - Withholding solves several problems:
    - Lowers compliance costs for workers
    - Avoids liquidity problems during the tax filing season
    - Reduces workers' ability to evade income tax

Tax Incidence with Salience Effects

- Central assumption of neoclassical model: change in tax is equivalent to change in price: $\left(\frac{dx}{dt} = \frac{dx}{dp}\right)$
  - In practice, are people full aware of marginal tax rates?
- Chetty, Looney and Kroft (2009) test this assumption and generalize theory to allow for salience effects
  - **salience**: visibility of tax-inclusive price
- **Part 1**: test whether salience affects behavioral responses to commodity taxation
  - Does the effect of a tax depend on whether it is included in the posted price?
- **Part 2**: develop formulas for incidence that permit salience effect and other optimization errors

Chetty, Looney, Kroft (2009): Framework

- Economy with two goods, x and y
- **Prices**: normalize price of y to 1, and let p denote the (fixed) pre-tax price of x
- **Taxes**: y is not taxed, x is subject to an ad valorem sales tax τ
  - Tax-inclusive price of x is $q = (1 + \tau)\, p$
  - Sales tax is not included in the posted price
- Let demand for good x be denoted by $x(p, \tau)$
  - Allows $\frac{\partial x}{\partial p} \neq \frac{\partial x}{\partial t}$

Chetty, Looney, Kroft (2009): Framework

- If agents fully optimize, demand should only depend on the tax-inclusive price: $x(p,\tau) = x((1+\tau)p, 0)$
  - implies price elasticity equals gross-of-tax elasticity:

$$\varepsilon_{x,p} \equiv -\frac{\partial \ln x}{\partial \ln p} = \varepsilon_{x,1+\tau} \equiv -\frac{\partial \ln x}{\partial \ln(1+\tau)}$$

- To test this hypothesis, log-linearize demand function to obtain the estimating equation:

$$\ln x(p,\tau) = \alpha + \beta \ln p + \theta\beta \ln(1+\tau)$$

  - θ measures degree to which agents under-react to the tax:

$$\theta = \frac{\partial \ln x}{\partial \ln(1+\tau)} \Big/ \frac{\partial \ln x}{\partial \ln p} = \frac{\varepsilon_{x,1+\tau}}{\varepsilon_{x,p}}$$

Chetty, Looney, Kroft (2009): Empirical Strategy

1. **Manipulate tax salience**: make sales tax as visible as pre-tax price
   - Effect of intervention on demand:

$$E = \ln x\left(\left(1+\tau\right)p, 0\right) - \ln x\left(p, \tau\right)$$

   - Compare to effect of equivalent price increase to estimate θ

$$\left(1-\theta\right) = -\frac{E}{\varepsilon_{x,p}\ln\left(1+\tau\right)}$$

2. **Manipulate tax rate**: compare $\varepsilon_{x,p}$ and $\varepsilon_{x,1+\tau}$

$$\theta = \frac{\varepsilon_{x,1+\tau}}{\varepsilon_{x,p}}$$

Strategy 1: Manipulating Tax Salience

- Manipulate salience of sales tax at a supermarket from a major grocery chain
  - 30% of products sold in store are subject to sales tax
  - They posted tax-inclusive prices on shelf for subset of products subject to sales tax ($\tau = 7.375\%$)
- Data: scanner data on price and weekly quantity sold by product

Strategy 1: Manipulating Tax Salience

Source: Chetty, Looney and Kroft (2009)

Strategy 1: Research Design

- Quasi-experimental diff-in-diff strategy:
  - Treatment group
    - Products: cosmetics, deodorants, hair care accessories
    - Store: one large store in Northern California
    - Time period: 3 weeks (22/02/2006 - 15/03/2006)
  - Control group
    - Products: other products in same (toothpaste, skin care)
    - Stores: two nearby stores with similar characteristics
    - Time period: full year 2005 and first 6 weeks of 2006 (before the experiment)

Strategy 1: Manipulating Tax Salience

Effect of Posting Tax-Inclusive Prices: Mean Quantity Sold

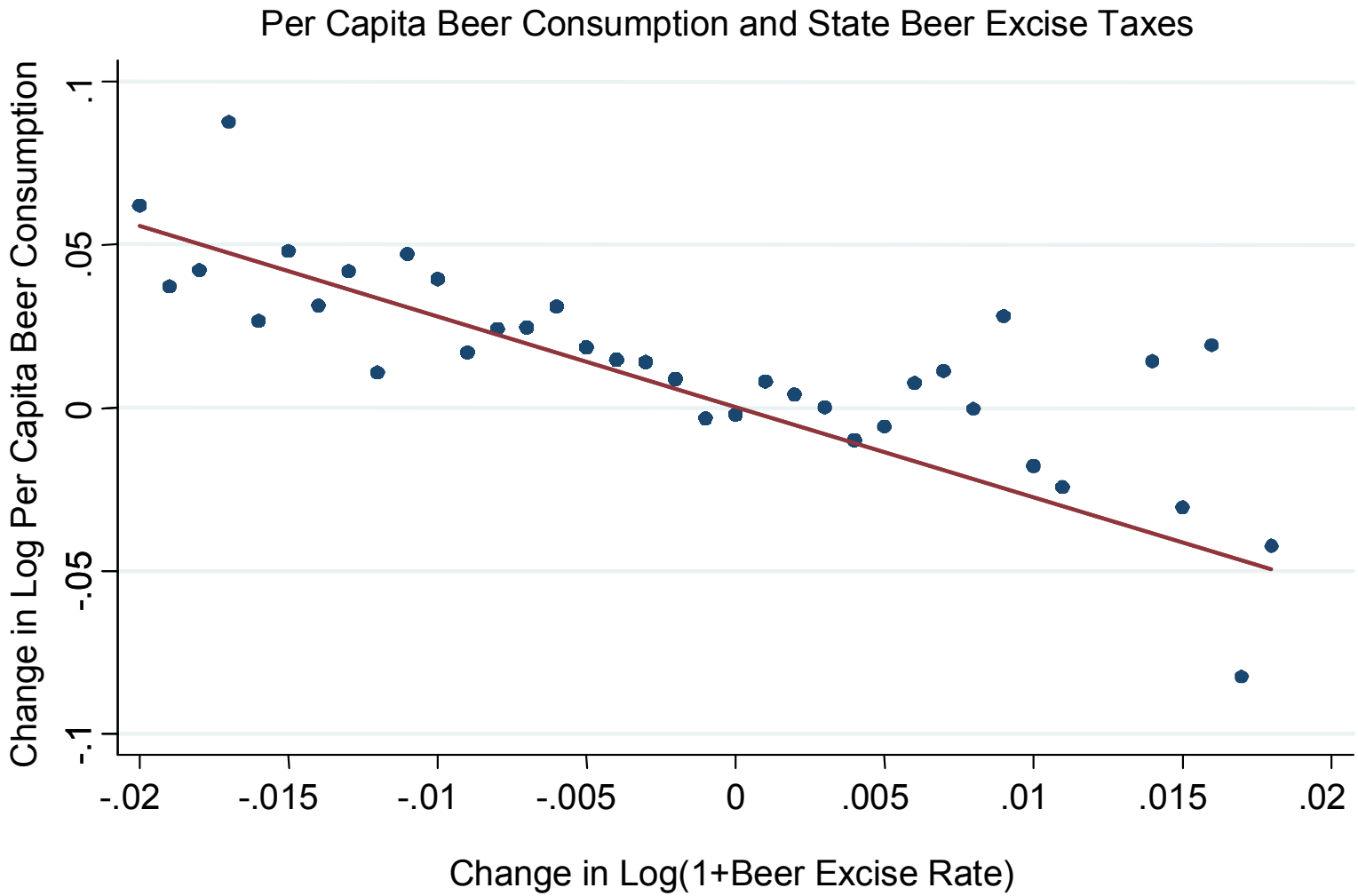
	TREATMENT STORE		
Period	Control Categories	Treated Categories	Difference
Baseline	26.48	25.17	-1.31
	(0.22)	(0.37)	(0.43)
Experiment	27.32	23.87	-3.45
	(0.87)	(1.02)	(0.64)
Difference over time	0.84	-1.30	**DD_{TS} = -2.14**
	(0.75)	(0.92)	(0.64)

Source: Chetty, Looney and Kroft (2009)

Strategy 2: Salient vs Non-Salient Taxes

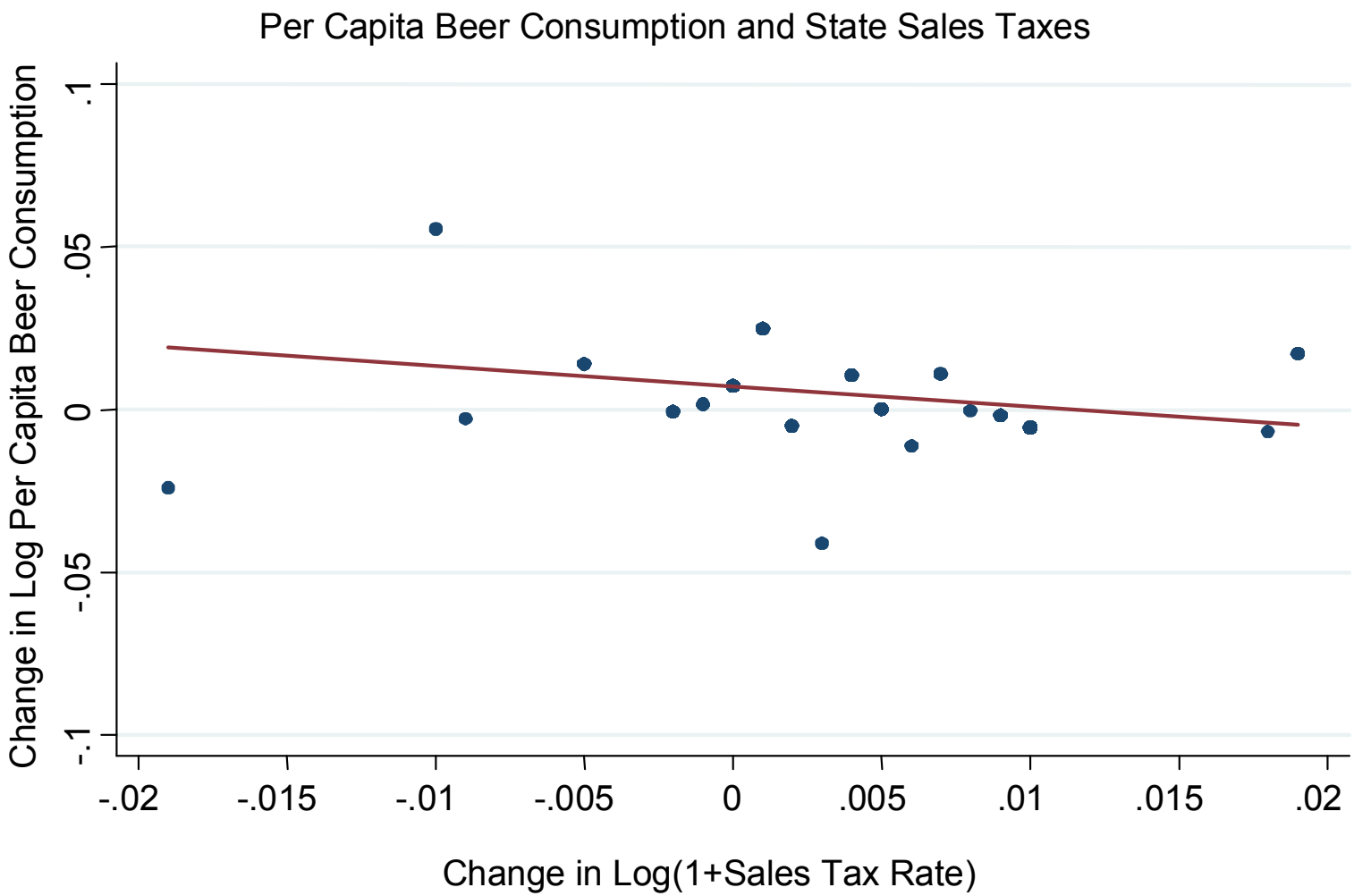
- Compare effects of price changes vs tax changes
- Alcohol subject to two different state-level taxes in the US
  - Excise tax: included in price (salient)
  - Sales tax: added at the cash register, not shown in posted price (not salient)
- Exploiting state-level changes in these two taxes, can estimate θ with a diff-in-diff strategy

Strategy 2: Impact of a Salient Tax



Source: Chetty, Looney and Kroft (2009)

Strategy 2: Impact of a Non-Salient Tax



Source: Chetty, Looney and Kroft (2009)

Tax Incidence with Salience Effects: Formula

1. Incidence on producers is attenuated by inattention
2. **No tax neutrality**: taxes levied on producers have greater incidence on producers that non-salient taxes levied on consumers
    - Intuition: producers need to cut pre-tax price less when consumers are less responsive to tax

Political economy considerations

- If tax salience matters for consumption behavior, it probably matters for politics as well.
  - If voters don't like taxes, make them less salient!
  - Ash (2016) shows that when a new political regime in U.S. states wants to change tax policy, they tend to implement that through the tax base (providing exemptions/deductions, closing loopholes) rather than the tax rate.
  - The details of the tax base (written in legalese in the code) are less salient than the marginal tax rate (a single number).

Course Feedback Form

- After class today I will send out a simple anonymous feedback form for you to provide some thoughts on the course so far.