

Policy Evaluation

6. Taxes on Goods and Services (Salience, Enforcement, and Incidence)

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TAX SALIENCE

Traditional model assumes that all individuals are fully aware of taxes that they pay

Is this true in practice? Most likely no because many taxes are not fully salient.

Do you know your exact marginal income tax rate? Do you think about it when choosing a job?

Do you know the tax rates for all the products you buy in the supermarket?

Chetty, Looney, and Kroft (2009, AER) test this assumption using one of the simplest taxes: sales taxes

In the US, this tax is paid at the cash register and not displayed on price tags in stores

Chetty, Looney, and Kroft (2009, AER)

Two empirical strategies to test whether salience matters:

1) **Randomized field experiment** with supermarket stores

Treatment: they display new price tags showing the level of sales tax and total price on a **subset** of products

DiD: Compare shopping behavior for treated vs. control products in treated store, before and after new tags

Repeat the analysis in control stores as a placebo DiD strategy

2) **Natural experiment** using changes in beer excise and sales taxes across states in the US

Excise tax (required on specific goods) is salient because built into posted price while sales tax is not salient because it is not included in posted price

Effect of Posting Tax-Inclusive Prices: Mean Quantity Sold

TREATMENT STORE			
Period	<u>Control Categories</u>	<u>Treated Categories</u>	<u>Difference</u>
Baseline	26.48 (0.22)	25.17 (0.37)	-1.31 (0.43)
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)

CONTROL STORES			
Period	<u>Control Categories</u>	<u>Treated Categories</u>	<u>Difference</u>
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)

DDD Estimate **-2.20**
(0.58)

Figure 2a

Per Capita Beer Consumption and State Beer Excise Taxes

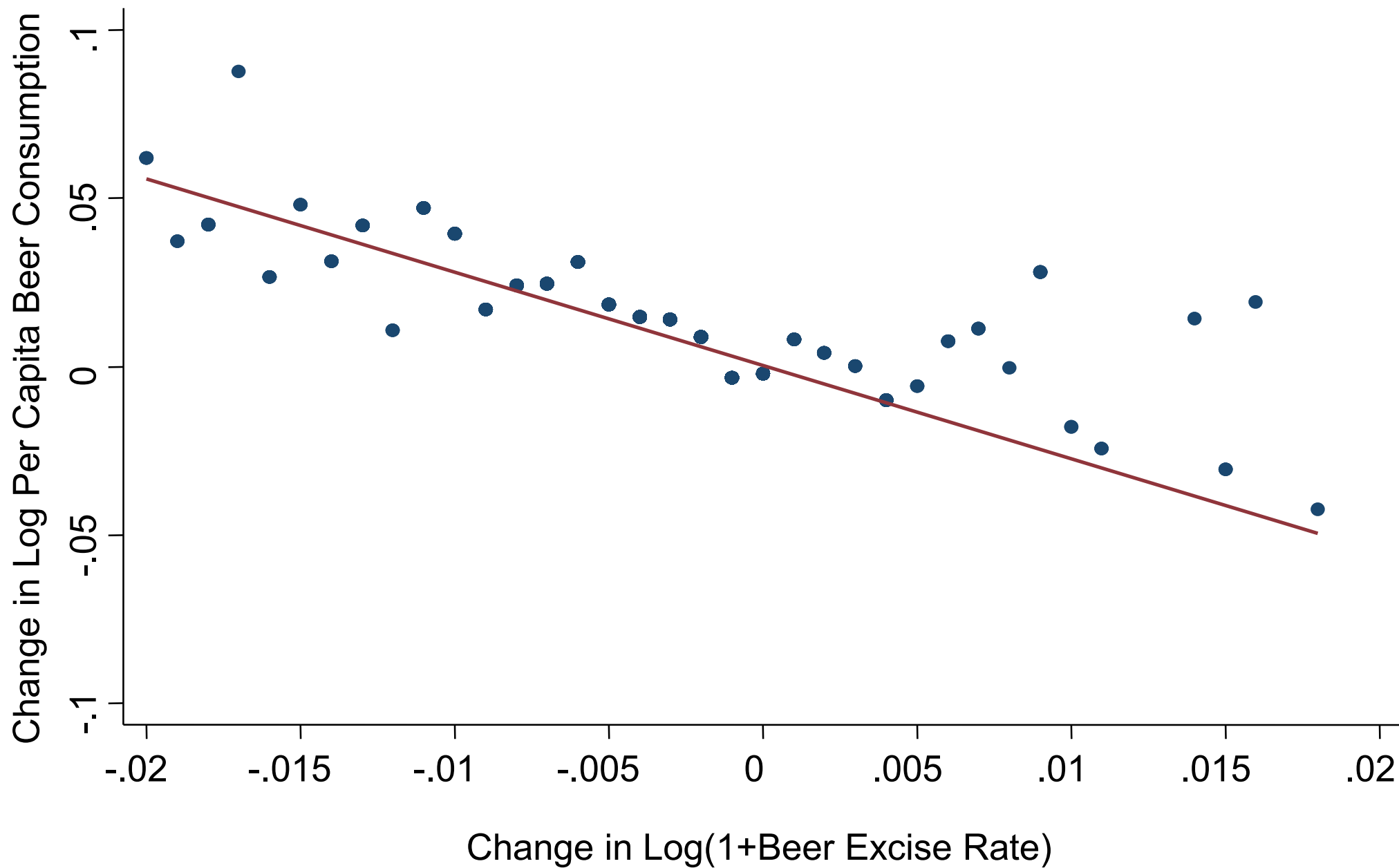
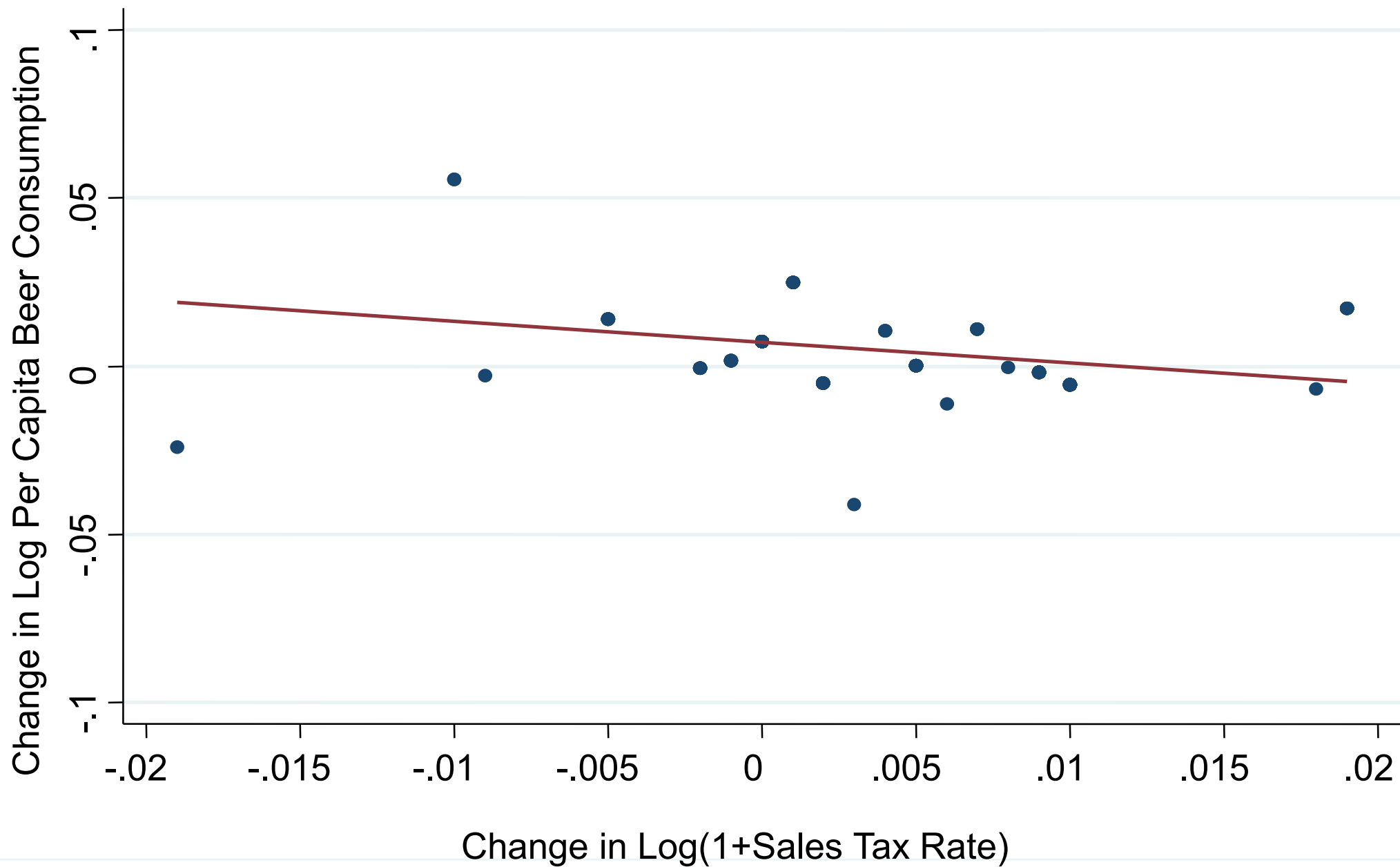


Figure 2b

Per Capita Beer Consumption and State Sales Taxes



Effect of Excise and Sales Taxes on Beer Consumption

Dependent Variable: Change in Log(per capita beer consumption)

	Baseline (1)	Bus Cyc, Alc Regs. (2)	3-Year Diffs (3)	Food Exempt (4)
$\Delta\text{Log}(1+\text{Excise Tax Rate})$	-0.87 (0.17)***	-0.89 (0.17)***	-1.11 (0.46)**	-0.91 (0.22)***
$\Delta\text{Log}(1+\text{Sales Tax Rate})$	-0.20 (0.30)	-0.02 (0.30)	-0.00 (0.32)	-0.14 (0.30)
Business Cycle Controls		x	x	x
Alcohol Regulation Controls		x	x	x
Year Fixed Effects	x	x	x	x
F-Test for Equality of Coeffs.	0.05	0.01	0.05	0.04
Sample Size	1,607	1,487	1,389	937

Note: Estimates imply $\theta_{\tau} \approx 0.06$

Key Empirical Result: Salience matters

1) Using scanner data on price/quantity for each product, they find that posting sales taxes reduces demand for those goods

Possible concern in experiment is “Hawthorne effect”

2) Beer consumption is elastic to excise tax rate (built in posted price) but not to the sales tax rate (not built in the posted price)

⇒ If tax is not salient to consumers, they are less elastic, and hence more likely to bear the tax burden

A number of recent empirical studies show that individuals are not fully informed and fully rational and this has large consequences for policy

Direct vs indirect taxation

- Modern distinction: individual characteristics
“direct taxes may be adjusted to the individual characteristics of the taxpayer, whereas indirect taxes are levied on transactions irrespective of the circumstances of buyer and seller” (Atkinson and Stiglitz, 1980, p. 427)

Cross-country variations:

- Nordic countries use high VAT to fund welfare state
- U.S. has low level of indirect taxation and no VAT

Sign of development?

- History of taxation dominated by indirect taxation (from salt and slaves to alcoholic drinks, card games, ...)
- Still prevalent in developing countries $\Rightarrow$ Taxes on transactions are easier to enforce (market is public)

IMF has been advocating adoption of VAT instead of tariffs

- E.U. request adoption of VAT to become Member State

The VAT (Value Added Tax)

A French invention

- Formal description by Maurice Lauré (1953), a civil servant
- Introduced in 1954

The spread of VAT

- Denmark (1967), Germany (1968), Sweden (1969), the U.K. (1973)
- EU VAT in 1977 (Sixth Directive)
- In 2020, 170 countries had VAT and 25 countries do not use VAT : the U.S., Afghanistan, Iraq, Syria, Koweit, Caiman Island, etc.

To understand its advantages, let me show you an example with 20% retail sales tax or 20% VAT rate

Retail sales tax (RST)

Principles

- A tax on the value of sales to final consumers
- Sales to other businesses (B2B) are untaxed

Characteristics

- (i) No taxation of intermediate goods
- (ii) Tax remittance at the final sale only
- (iii) RST requires an “end user” distinction to be made, between sales to businesses (untaxed) and sales to final consumers (taxed)

RST Example

Firm 1

		RST
Sales	€ 1000	€ 0
Inputs	€ 0	
Wages	€ 800	
Profit	€ 200	
net RST paid = € 0		

Firm 2

		RST
Sales	€ 3000	€ 600
Inputs	€ 1000	
Wages	€ 1800	
Profit	€ 200	
net RST paid = € 600		

Total tax paid = € 600

VAT

Principles

- It applies to all sales to private consumers and other businesses (B2C and B2B)
- Businesses can offset the VAT on their purchases (input VAT) against the liability on their sales (output VAT)

Characteristics

- (i) No taxation of intermediate goods
- (ii) Remittance is 'fractional' (remitted at each stage)
- (iii) Third party reporting
- (iv) Tax collection earlier (cash flow benefit)

VAT Example

Firm 1			Firm 2		
		VAT			VAT
Sales	€ 1000	€ 200	Sales	€ 3000	€ 600
Inputs	€ 0		Inputs	€ 1200	-€ 200
Wages	€ 800		Wages	€ 1800	
Profit	€ 200		Profit	€ 200	
net VAT = € 200			net VAT = € 400		
Total tax remitted = € 600					

TAX COMPLIANCE

Third party reporting creates paper trail and creates incentives for information gathering

Important advantage of VAT over RST in theory: limit fraud

Little evidence of the impact of third party reporting until Pomeranz (2015, AER):

Two randomised experiments with 445,000 firms in Chile on VAT compliance

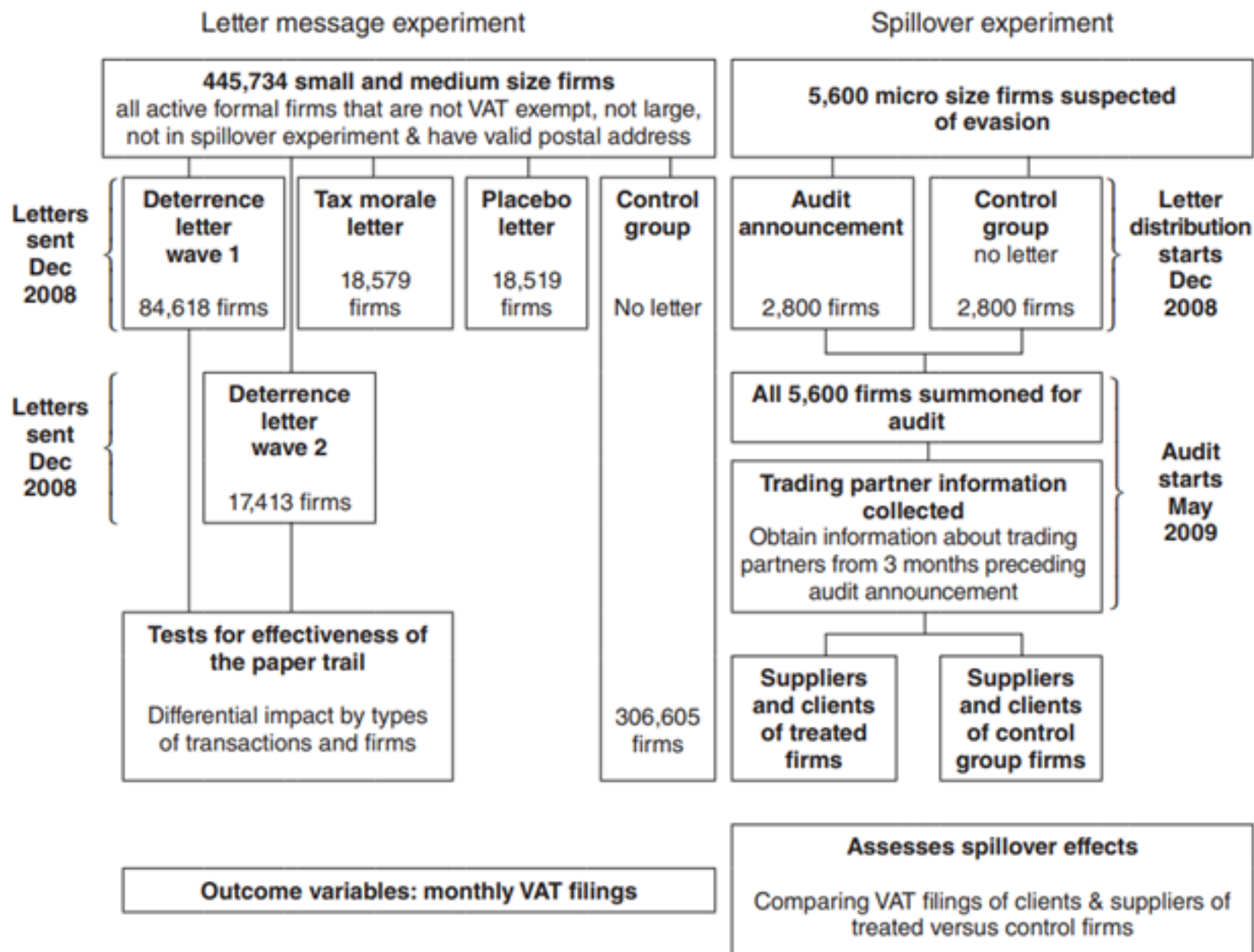
Pomeranz (2015, AER)

Experiment 1: deterrence letter

- Threat of VAT audit letters to sub-sample of businesses (+100,000 firms)
- Assessment of VAT reporting from firms for final sales or intermediate sales

Experiment 2: spillover effect

- Sample of firms suspected of tax evasion randomly told about an upcoming audit
- The whole sample later audited and information about their pretreatment trading partners was collected



Experiment 1

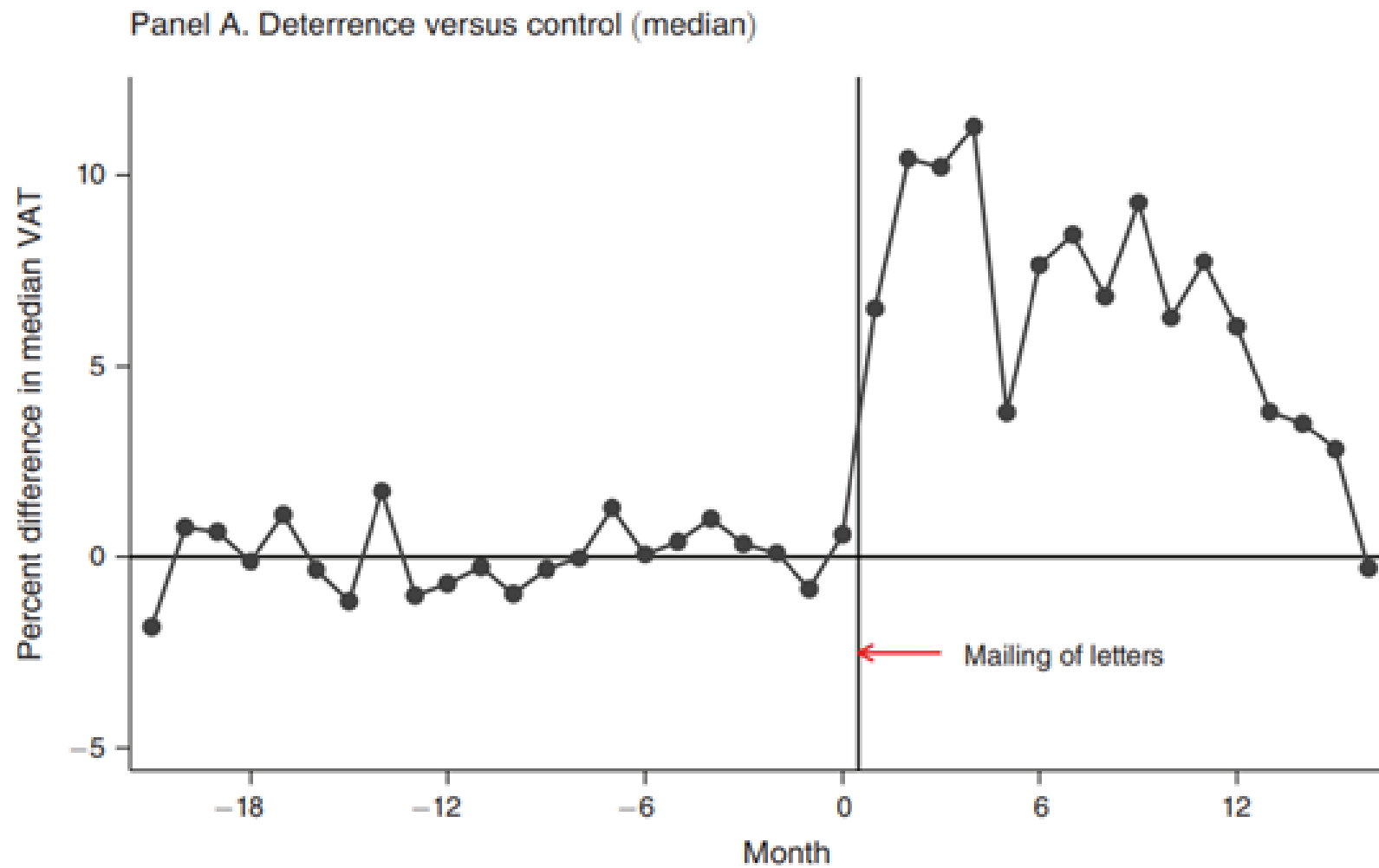


TABLE 4—LETTER MESSAGE EXPERIMENT: INTENT-TO-TREAT EFFECTS ON VAT PAYMENTS BY TYPE OF LETTER

	Mean VAT (1)	Median VAT (2)	Percent VAT > previous year (3)	Percent VAT > predicted (4)	Percent VAT > zero (5)
Deterrence letter × post	−1,114 (2,804)	1,326*** (316)	1.40*** (0.12)	1.42*** (0.10)	0.53*** (0.09)
Tax morale letter × post	−1,840 (6,082)	262 (666)	0.40 (0.25)	0.30 (0.22)	0.44** (0.20)
Placebo letter × post	835 (6,243)	383 (687)	−0.11 (0.26)	−0.19 (0.23)	−0.14 (0.20)
Constant	268,810*** (1,799)	17,518*** (112)	47.50*** (0.07)	48.27*** (0.07)	67.30*** (0.06)
Month fixed effects	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	No	Yes	Yes	Yes
Treatment assignment	No	Yes	No	No	No
Observations	7,892,076	1,221,828	7,892,076	7,892,076	7,892,076
Number of firms	445,734	445,734	445,734	445,734	445,734
Adjusted R^2	0.40		0.14	0.28	0.47

TABLE 5—IMPACT OF DETERRENCE LETTER ON DIFFERENT TYPES OF TRANSACTIONS

	Percent sales > previous year (1)	Percent input costs > previous year (2)	Percent intermediary sales > previous year (3)	Percent final sales > previous year (4)
Deterrence letter $\times$ post	1.17*** (0.22)	0.16 (0.21)	0.12 (0.19)	1.33*** (0.21)
Constant	55.39*** (0.13)	53.25*** (0.13)	38.37*** (0.12)	45.04*** (0.12)
Month fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Observations	2,392,529	2,392,529	2,392,529	2,392,529
Number of firms	133,156	133,156	133,156	133,156
Adjusted R^2	0.25	0.22	0.30	0.32

Announcing additional monitoring has less impact on transactions that are subject to a paper trail, indicating its preventive deterrence effect

Experiment 2

TABLE 7—SPILLOVER EFFECTS ON TRADING PARTNERS' VAT PAYMENTS

	Percent VAT > previous year (1)	Percent VAT > predicted (2)	Percent VAT > previous year (3)	Percent VAT > predicted (4)	Percent VAT > previous year (5)	Percent VAT > predicted (6)
Audit announcement × post	2.41** (1.14)	2.03* (1.11)				
Audit announcement × supplier × post			4.28*** (1.54)	3.92*** (1.50)	4.14*** (1.52)	3.83*** (1.52)
Audit announcement × client × post			−0.26 (1.64)	−0.28 (1.51)	−0.14 (1.67)	−0.28 (1.55)
Supplier × post			−0.64 (1.62)	0.34 (1.59)	−1.11 (1.67)	0.60 (1.64)
Constant	52.07*** (0.95)	49.06*** (0.94)	52.07*** (0.95)	49.06*** (0.94)	52.75*** (0.96)	50.11*** (0.96)
Controls × post	No	No	No	No	Yes	Yes
Controls × audit announcement × post	No	No	No	No	Yes	Yes
Month fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	45,264	45,264	45,264	45,264	44,288	44,288
Number of firms	2,829	2,829	2,829	2,829	2,768	2,768
Adjusted R^2	0.05	0.11	0.05	0.11	0.05	0.10

Compliance issues also with VAT

The “last mile” problem of the self-enforcing mechanism of the VAT: at the final consumer stage, incentives break down since consumers typically derive no direct monetary benefit from asking for receipts.

Naritomi (2019, AER) studies an anti-tax evasion program in São Paulo, Brazil (Nota Fiscal Paulista) that

- rewards consumers (tax rebates and monthly lottery prizes) for ensuring that firms report sales
- establishes a direct communication channel between the tax authority and consumers through an online account system, where consumers can verify receipts reported by firms and act as whistle-blowers

DiD: compare changes in firms that sell mostly to final consumers (retail) vs. sell mostly to other firms (wholesale)

Naritomi (2019, AER)

Although firms increased sales by 20%, tax revenue net of rewards increased by only 9%

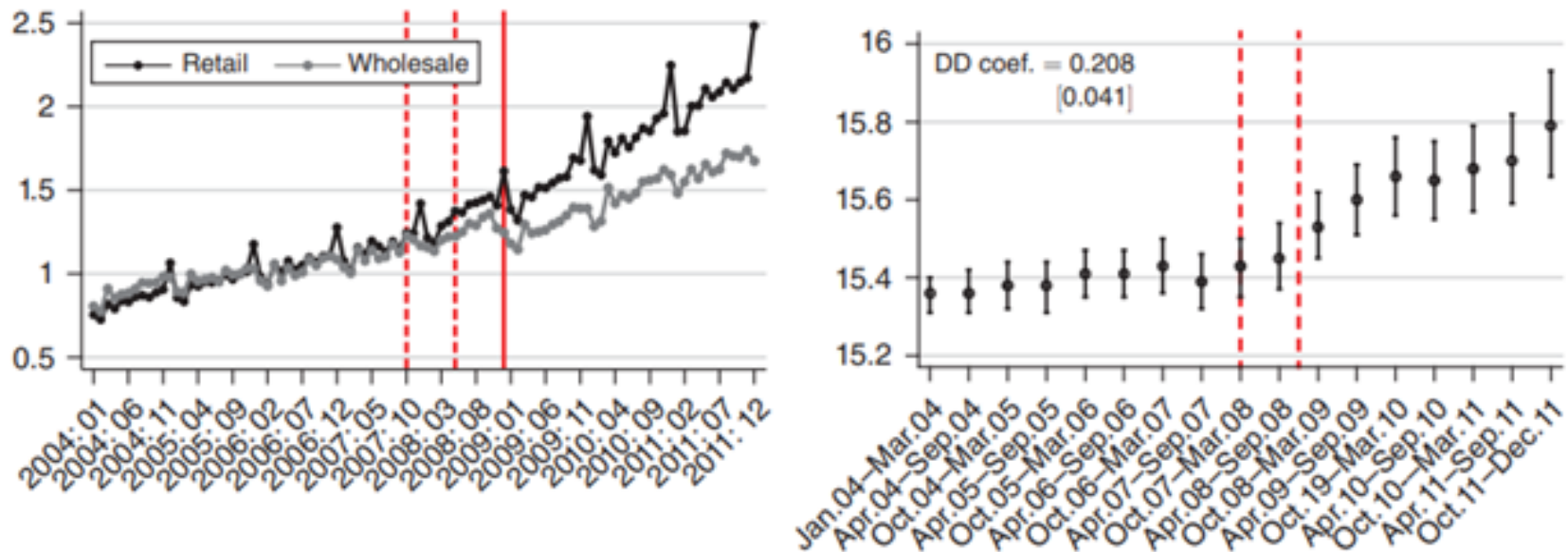


FIGURE 2. EFFECT OF THE POLICY ON REPORTED REVENUE: RETAIL VERSUS WHOLESALE

TAX INCIDENCE

Tax incidence is the study of the effects of tax policies on prices and the economic welfare of individuals

What happens to market prices when a tax is introduced or changed?

Key point: Taxes can be shifted: taxes affect directly prices, which affect quantities because of behavioral responses, which affect indirectly the price of other goods.

Effect on price $\Rightarrow$ distributional effects on consumers, profits of producers, shareholders, input providers, etc.

If prices are constant economic incidence would be the same as legislative incidence.

TAX INCIDENCE

Ideally, we want to know the effect of a tax change on utility levels of all agents in the economy.

Realistically, we usually look at impacts on prices or income, rather than utility

Useful simplification is to aggregate economic agents into a few groups. Examples:

- 1) gas tax: producers vs consumers
- 2) income tax: rich vs poor
- 3) property tax: region or county
- 4) social security: across generations

EU VAT Experiments

Normal VAT rates are high (15-25%) but some goods/services have reduced rates (or are exempt)

EU directive allowing reduced VAT rates in labour intensive sectors

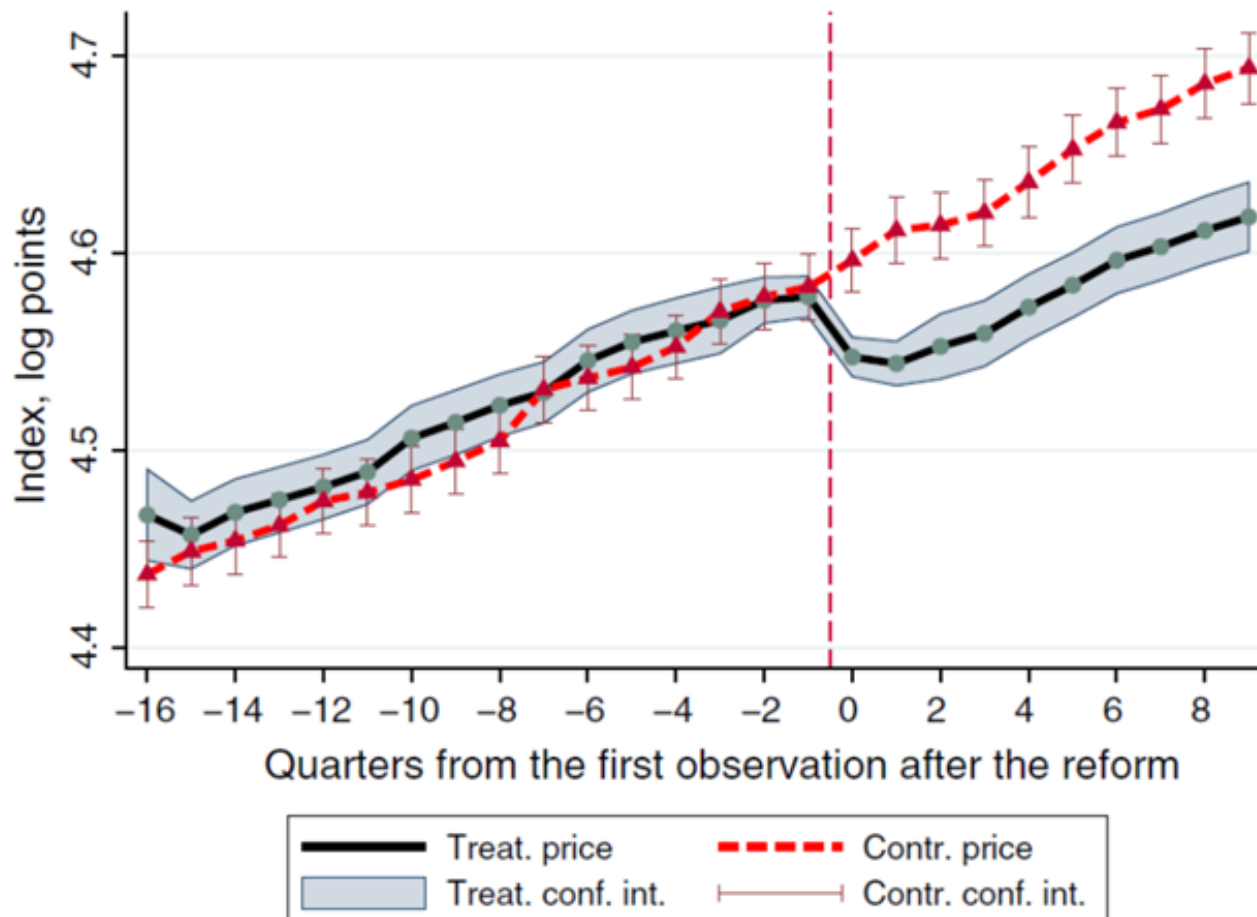
- Aim to experiment whether reduced VAT rates can increase employment and reduce the shadow economy

Kosonen (2015, JPubE) exploits a VAT reform in Finland

- 2007: Cut in VAT rate on hairdressing services from 22% to 8% (-14 ppts)
- DiD: comparing beauty salons (control) and hairdressing (treatment)

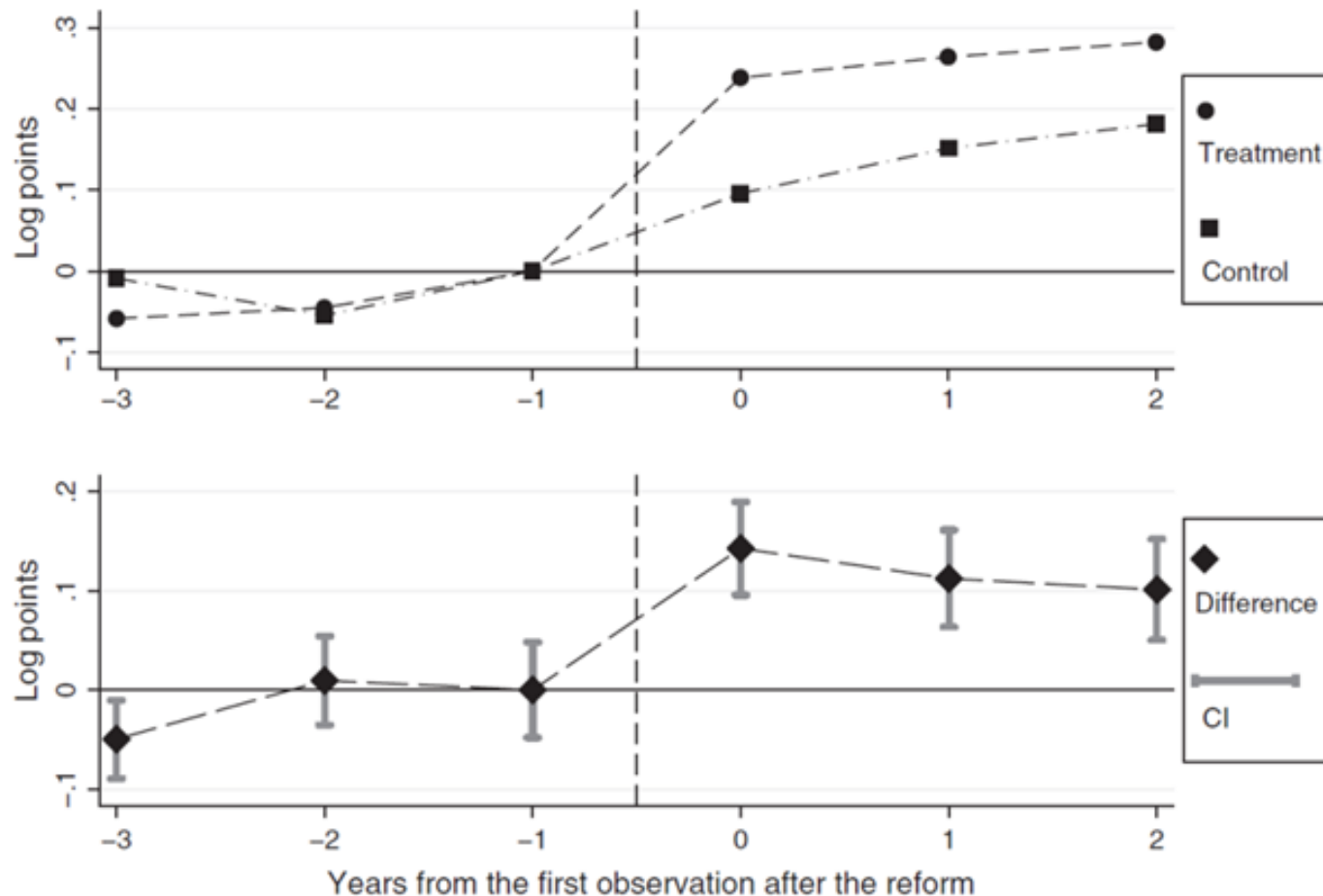
Kosonen (2015, JPubE): Effects on prices

Pass through is only half of what complete pass-through would have implied: consumer prices reduced by -5% to -6%



Kosonen (2015, JPubE): Effects on profits

Hardly any adjustment in quantities, wages or employment, but most hairdressers were able to increase their profits



Who Really Benefits From Consumption Tax Cuts?

Benzarti and Carloni (2019, AEJ:EP) evaluates the incidence of a large cut in VAT for French sit-down restaurants in 2009

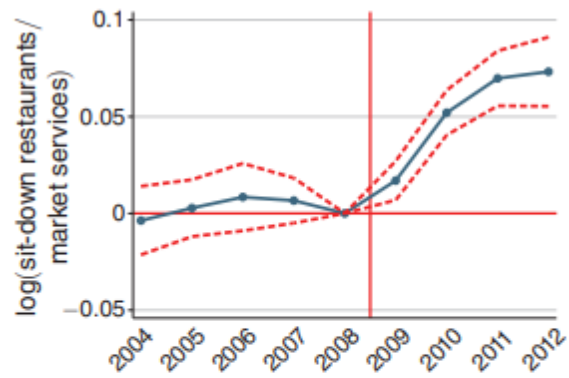
They focus on the effects of the VAT cut on four groups: workers, firm owners, consumers, and suppliers of material goods.

DD strategy on firm-level data (comparison group: non-restaurant market services, including wholesale and retail trade; repair of motor vehicles; accommodation activities; information and communication; financial and real estate activities; professional, scientific, and technical activities)

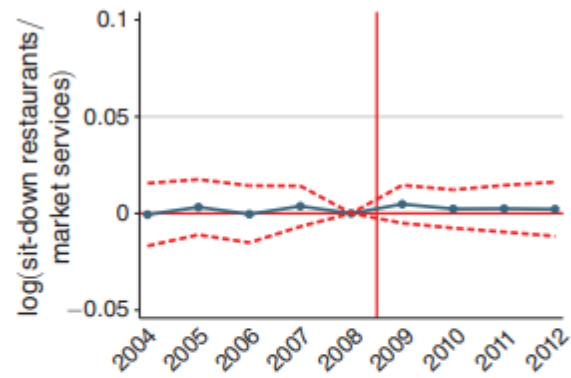
Findings:

- firm owners pocketed more than 55 percent of the VAT cut
- consumers, sellers of material goods, and employees shared the remaining windfall with consumers benefiting the least
- the employment effects were limited.

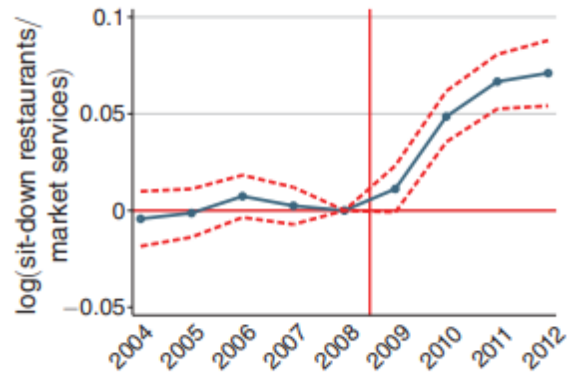
Panel A. Cost of employees



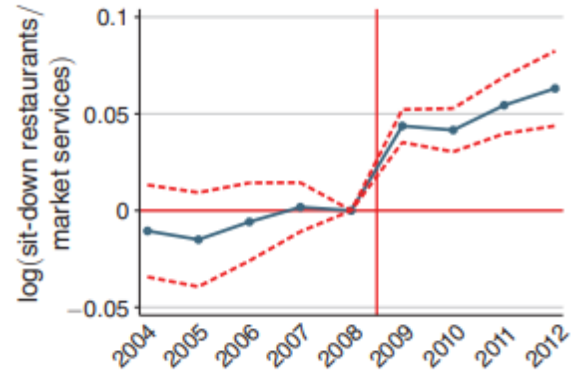
Panel B. Number of employees



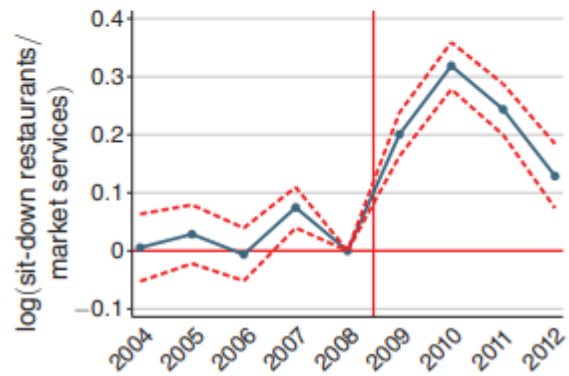
Panel C. Cost per employee



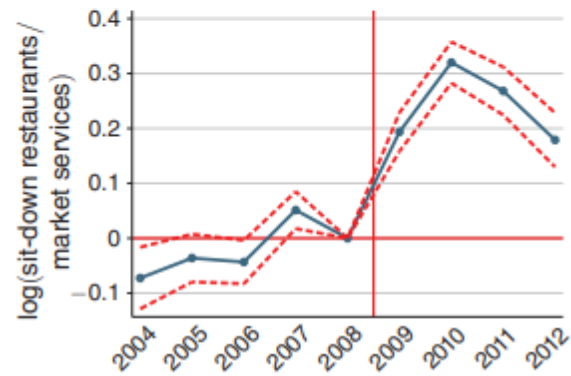
Panel D. Cost of material goods



Panel E. Profits



Panel F. Return on total assets



Asymmetry of VAT pass-through?

Benzarti et al. (2020, JPE) study the effects of VAT rates $\uparrow$ and $\downarrow$

Following Kosonen (2015), hairdressers in Finland got a VAT cut of 14 points in Jan 2007 that was repealed in Jan 2012

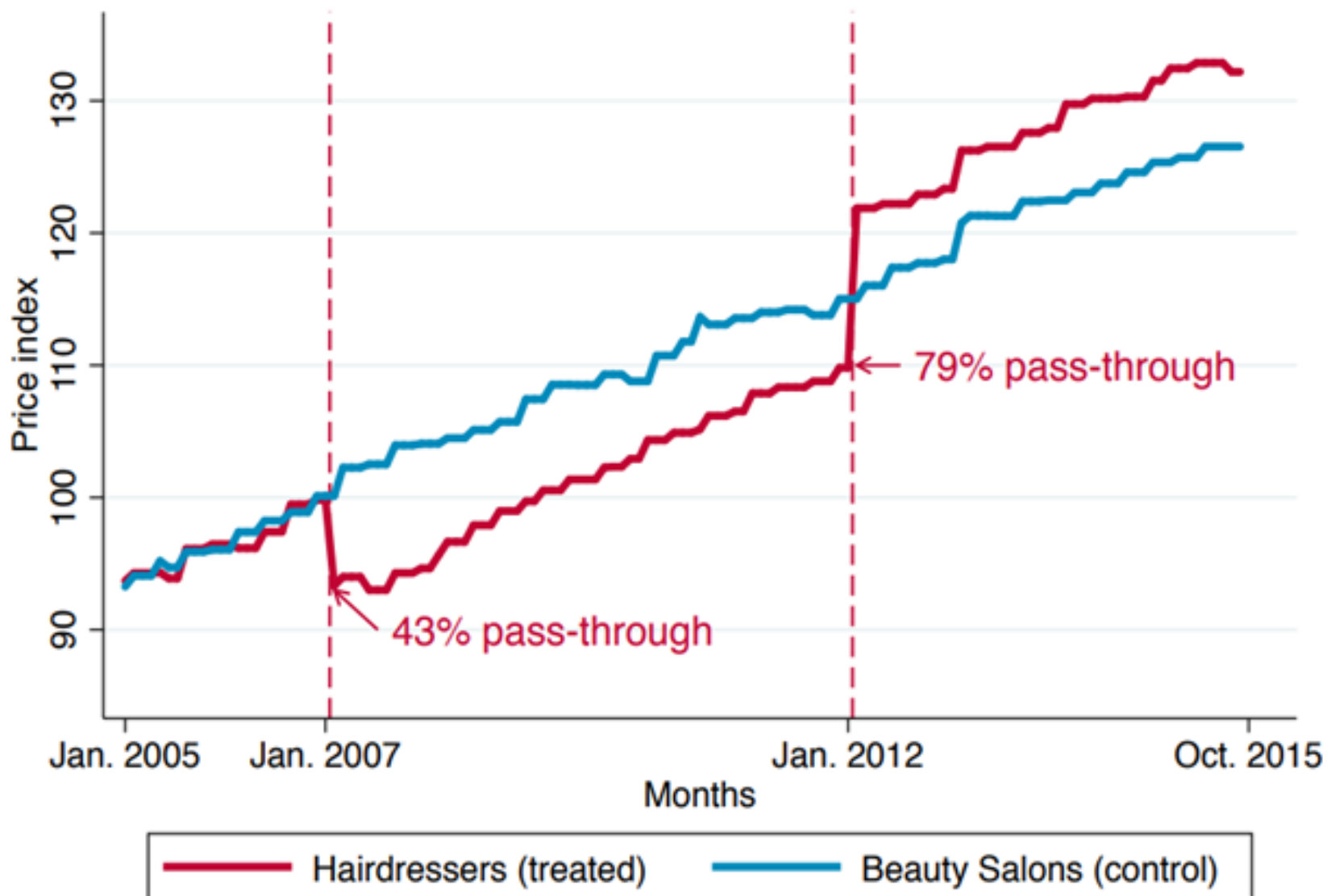
$\Rightarrow$ Find that tax decreases are only 50% passed on consumers while tax increases are almost fully passed on consumers

Most likely explanation:

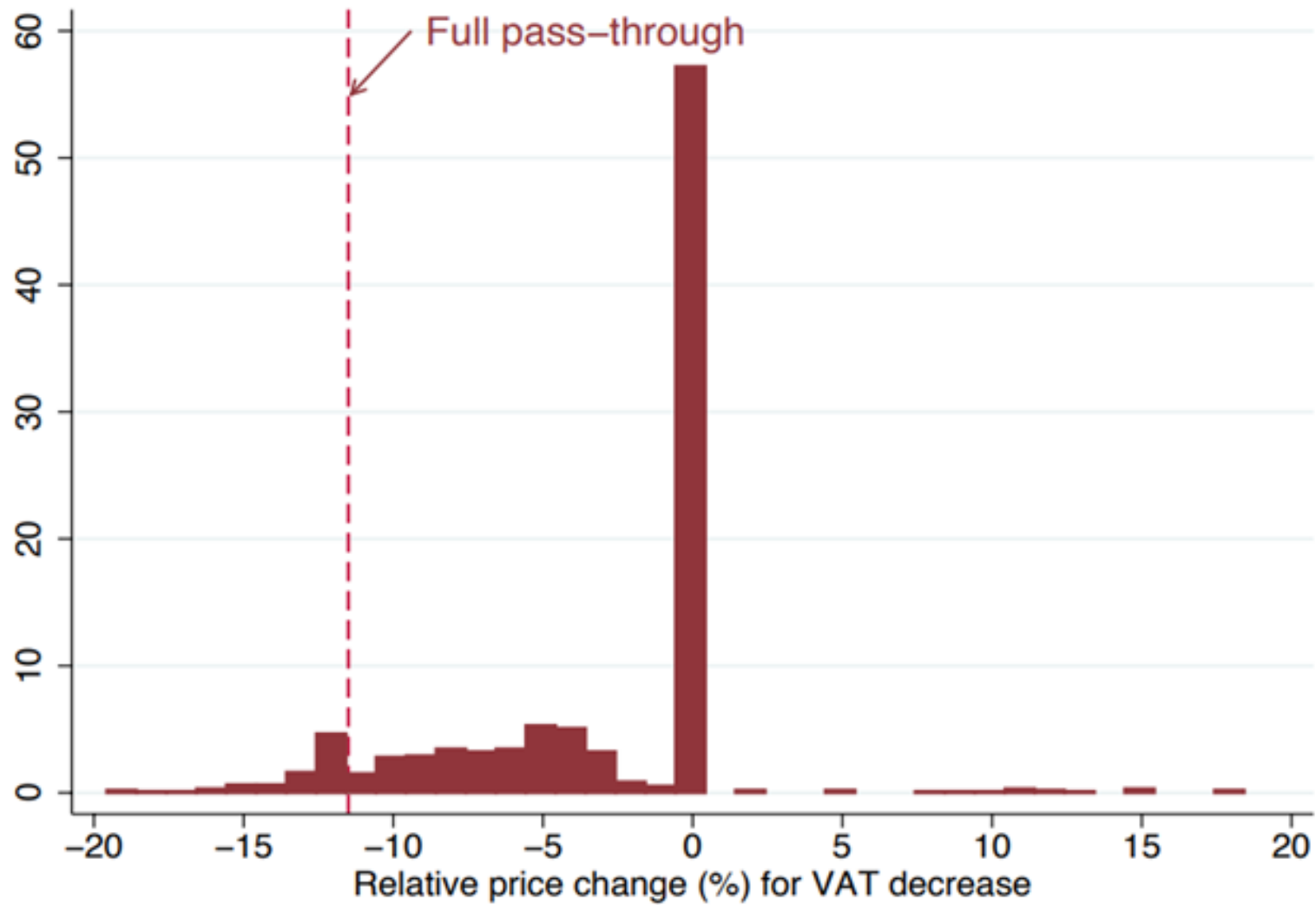
- producers pocket tax cut because consumers are inattentive to taxes
- producers pass tax increase because they can justify the price increase to consumers

Confirm their results using French restaurant VAT reforms and EU VAT rate changes from 1996 to 2015 (with less detailed Eurostat price data)

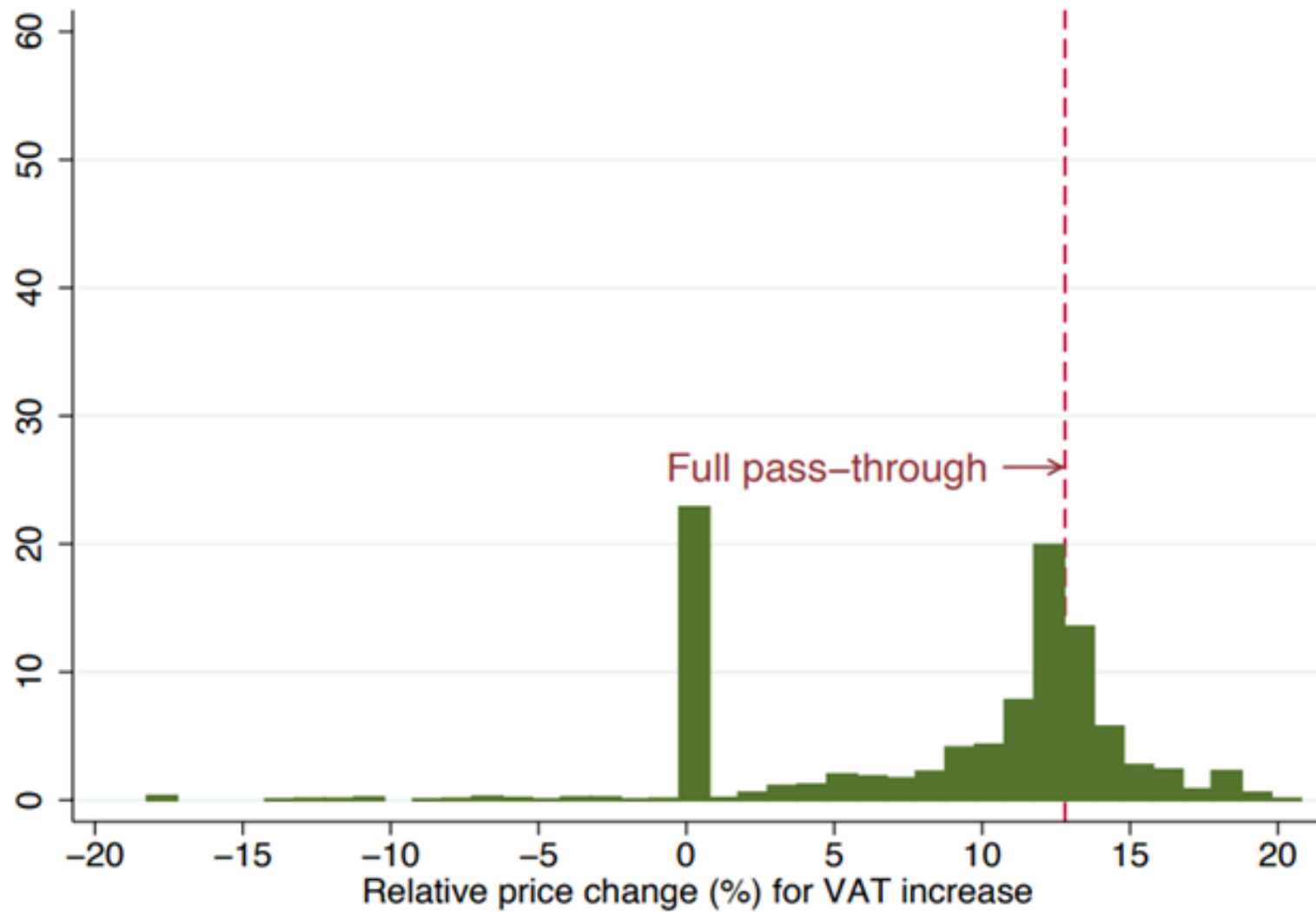
Benzarti, Carloni, Harju and Kosonen (2020, JPE)



Distribution of pass-through (VAT decrease)



Distribution of pass-through (VAT increase)



Impact on profits

