

Effect of Cigar and Cigarette Taxes in Reducing Youth Smoking?

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Introduction

Tobacco use is the leading cause of preventable deaths in the US.

Reducing smoking is an important policy goal.

Policymakers focus on preventing youth smoking.

- Most adult smokers start as teenagers.
- Cigarettes and cigars are two of the products.

Tobacco taxes are one of the main policy levers.

- Cigarettes and cigars are taxed differently.
- Policymakers have primarily focused on cigarettes.

Do cigarette and cigar taxes reduce cigarette and cigar use among youth?

Introduction: A Look Into Cigars

Cigars - Large cigars, little cigars, cigarillos. Cigars

Cigars are available in flavors and have seen a slow and steady rise in sales.

Cigar use is more common among low-income, male, African-American, and LGBTQ populations.

- More high school boys use cigars than use cigarettes (9.0% for cigars and 7.3% for cigarettes).

Introduction: Comparing Cigarettes and Cigars

Cigarettes and cigars pose similar health risks.

What are some differences in regulation? Regulation

- Cigars are available in smaller packs of two sticks ("loosies"), compared to 20 cigarettes.
- Cigars are available in flavors. (Chocolate, Strawberry, Menthol)
- Cigarettes taxes are much higher than cigar taxes.

Cigars are rolled in tobacco leaf, making them more likely than cigarettes to be re-rolled with marijuana as blunts.

Are higher cigarette taxes driving youth into cigar use?

Why are cross-tax effects important?

If people switch across products or use multiple products, analyzing only cigarettes overestimates the effectiveness of cigarette taxes.

A positive and sufficiently large increase in cigar use would mean that we could end up with more people smoking cigars. Elasticity

What we know about tobacco taxes and smoking is the upper bound if we do not pay attention to cigars and marijuana.

What do we know from literature?

Cigarette use:

- Cigarette taxes have small effects on cigarette use (Hansen et al. (2017); Anderson et al. (2020)).
- No evidence on the effect of cigar taxes.

Cigar use: Mixed evidence (Ringel et al. (2004); Hawkins et al. (2018)).

Marijuana use:

- Cigarette taxes have no effect on marijuana use (Anderson et al. (2020)).
- No evidence on the effect of cigar taxes.

Research Questions and Contributions

What are the effects of cigarette and cigar tax on youth cigarette and cigar use?

- Is there substitution from cigarettes to cigars?

I find an asymmetry in cross-tax elasticity.

- When I study cigarette use, cigarettes and cigars appear to be complements.
 - Cross-tax elasticity is negative.
- When I study cigar use, cigarettes and cigars appear to be substitutes.
 - Cross-tax elasticity is positive.

The asymmetry in cross-tax elasticities has not yet been discussed in literature.

I find that marijuana use might be a reason for the asymmetry.

Does misreporting affect the estimates?

Data

Use the National and State YRBS.

- Repeated cross-sectional surveys.
- 1999-2017.

Variables:

- Outcomes: Current cigarette, cigar, marijuana use.
- Individual covariates: Age, sex, race.

Tobacco taxes:

- Data on cigarette and cigar tax from the CDC STATE system.

State-level covariates:

- Comprehensive smoke-free air law, marijuana decriminalization and legalization, state per capita personal income, and state unemployment rate.

Summary Statistics

Table 1: Summary statistics: YRBS 1999-2017

	1999		2017		1999-2017	
	Mean	Std.Dev.	Mean	Std.Dev.	Mean	Std.Dev.
Outcome Variables						
Current cigarette use	0.32	(0.47)	0.08	(0.27)	0.15	(0.36)
Current cigar use	0.17	(0.37)	0.08	(0.27)	0.11	(0.31)
Current marijuana use	0.23	(0.42)	0.19	(0.39)	0.19	(0.40)
Tobacco Taxes						
Cigarette tax (2017 \$)	0.52	(0.37)	1.94	(0.95)	1.58	(1.00)
Cigar tax (Ad-valorem)	0.20	(0.15)	0.32	(0.24)	0.29	(0.20)
Observations	37,218		138,499		867,375	

1. Data used are from ten waves of the Youth Risk Behavioural Surveillance System (YRBS) for years 1999-2017. 2. Current cigarette/cigar smokers reported using the product for more than one day in the past 30 days. 3. Current marijuana users reported using marijuana more than once in the past 30 days.

Methodology

Using a difference-in-differences approach,

$$P(Y_{ist} = 1) = \beta_1 Cigarettetax_{st} + \beta_2 Cigartax_{st} \\ + \mathbf{X}'\gamma + \tau_t + \sigma_s + \epsilon_{ist}$$

where i, s, t are the indexes for individual, state, and year.

- $Y \rightarrow = 1$ for cigarette, cigar, or marijuana user.
- $X \rightarrow$ Individual and State-level characteristics.
- $\tau, \sigma \rightarrow$ Year and state fixed effects.
- Use a logit model and report marginal effects.

Identification

Cigarette and cigar taxes vary across states and over time.

- I use state and year fixed effects.
- Within-state variation.

Changes in cigarette and cigar tax:

- 47 states changed cigarette tax between 1999-2017.
- 36 states changed cigar tax.
- Approximately 350 tax changes.

Results: Tobacco Taxes and Youth Smoking

Table 2: Tobacco Taxes and Youth Smoking

	(1) Cigarette	(2) Cigar	(3) Marijuana
Cigarette tax	-0.002 (0.003)	0.008** (0.003)	0.009** (0.004)
Elasticity x 100	[-2.11]	[12.64]	[7.48]
Cigar tax	-0.026 (0.015)	-0.002 (0.014)	-0.031*** (0.010)
Elasticity x 100	[-5.03]	[-0.58]	[-4.73]
Observations	867,375	867,375	867,375

- A 100% **increase in cigarette tax** leads to a 2.11% **decrease in cigarette use**, 12.64% **increase in cigar use**, and 7.48% **increase in marijuana use**.

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- A 100% **increase in cigar tax** leads to a 5.03% **decrease in cigarette use**, 0.58% **decrease in cigar use**, and 4.73% **decrease in marijuana use**.

Conclusions

Reducing the difference between cigar and cigarette tax can help reduce smoking.

- Increasing cigar tax can be an effective tool to reduce smoking.
- Increasing only cigarette tax leads to an increase in cigar and marijuana use.

Misreporting increases the magnitude of the elasticity estimates (True cross-tax elasticities are higher).

There is a need to understand marijuana use and its interaction with other tobacco products among youth.

Future Work

Address heterogeneity in the type of smokers using mixture models.

Analyze tobacco use modelling for marijuana taxes/prices.

- Nine states currently tax marijuana. (Wholesale price, weight, THC level)

With increasing marijuana legalization, it is important to understand how marijuana interacts with tobacco products.

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Figure 1: Types of Combustible Tobacco Products



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Figure 2: Cigarillos and Cigarettes



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