

The Impact of Smoking Bans in Bars and Restaurants on Alcohol Consumption, Smoking, and Alcohol-Related Externalities

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Disclosures

- No financial disclosures to report

Researcher's own analyses calculated (or derived) based in part on data from Nielsen Consumer LLC and marketing databases provided through the NielsenIQ Datasets at the Kilts Center for Marketing Data Center at The University of Chicago Booth School of Business. The conclusions drawn from the NielsenIQ data are those of the researcher and do not reflect the views of Nielsen. Nielsen is not responsible for, had no role in, and was not involved in analyzing and preparing the results reported herein.

Controversial policy

- Effects on secondhand smoke
- Predicted decrease in drinking at bars
- External effects on alcohol-related crimes
- Effects on drunk driving

Effects on secondhand smoke

- Smoking bans reduce smoking, cardiovascular and asthma-related hospital admissions in Germany (Anger, Kvasnicka, and Siedler, 2011; Kvasnicka, Siedler, and Ziebarth, 2018)
- Smoking bans reduce smoking by pregnant women in Norway, mitigating externality to fetuses (Bharadwaj, Johnsen, and Løken, 2014)

Predicted decrease in drinking at bars

- “I’ve been a bartender for 35 years, and they’re trying to destroy my business.”
 - California bartender
- “Personally, I’m OK with it... But business wise, I don’t know what to think.”
 - North Dakota bar owner
- “I was extremely worried about how the ban would affect my tavern, as probably 75 percent of my customers were smokers.”
 - Wisconsin bar owner
- “There will probably be a lot more homebodies.”
 - Wisconsin bartender

External effects on alcohol-related crimes

- Drinking at bars linked to increases in
 - drunk driving (Adams and Cotti, 2008)
 - bar fights and homicides (Tomé, 2019)
 - sexual assaults (Anderson, Crost, and Rees, 2018)
- Drinking at home linked to increases in
 - domestic violence (Markowitz and Grossman, 1998)

Research question

- What are the effects of U.S. bar & restaurant smoking bans on
 - amount of alcohol consumption
 - location of alcohol consumption (at bar/restaurant vs. at home)
 - smoking
 - alcohol-related externalities

Preview of Results

- Alcohol consumption increases (at bars/restaurants)
- No change in smoking status (frequent, occasional, never, former)
- Increase in fatal drunk-driving crashes in high smoking prevalence areas
- No change in other alcohol-related externalities

Background

- Governments have long intervened to correct market failures
 - e.g., externalities from cigarette smoking
- Smoking bans represent a transfer of property rights

Background

- Governments have long intervened to correct market failures
 - e.g., externalities from cigarette smoking
- Smoking bans represent a transfer of property rights
- Smoking bans change the environment of bars
 - change in non-price determinant of demand for alcohol in bars → changes in alcohol consumption
 - differs by smoking status
 - spatial heterogeneity in laws → multiple margins for behavioral responses
 - → competing externalities

[Debate over bans](#)[Example map](#)

Contribution to literature: part I

- **Health economics:** effect of policies regarding smoking, drinking, and their externalities
 - smoking: Adda & Cornaglia (2006), Adda & Cornaglia (2010), Anger et al. (2011), DeCicca, Kenkel, & Lovenheim (2020), Evans et al. (1999), Kvasnicka et al. (2018), and many others
 - alcohol consumption: Carpenter et al. (2016), Chalfin et al. (2019), Lovenheim and Steefel (2011), Nilsson (2017), and many others
 - interaction of risky health behaviors: Adams & Cotti (2008), Anderson et al. (2013), Koxsal & Wohlgenant (2016), Picone et al. (2004)
- **Contribution:** first to incorporate city and county laws; use broader and more representative data

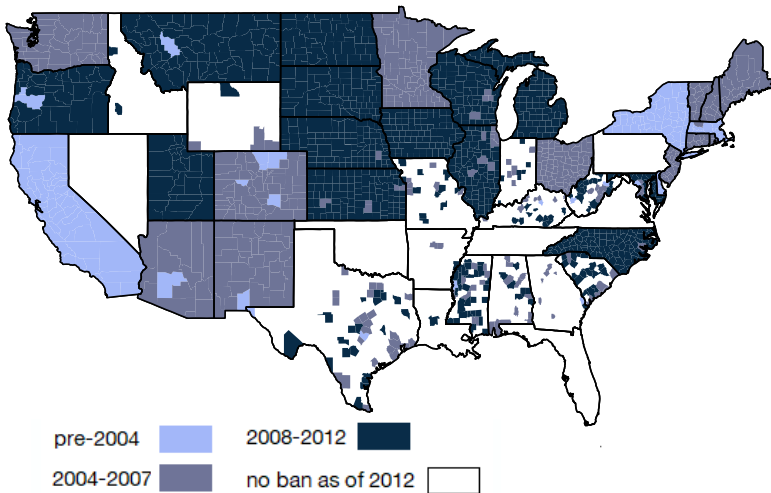
Contribution to literature: part II

- **Public economics:** spillover effects of local policies & optimal regulation of externalities
 - e.g., Beard et al. (1997), Beatty et al. (2009), Cawley et al. (2018), Lovenheim (2008), Lovenheim & Slemrod (2010), Ogawa & Wildasin (2009), Stehr (2007)
- **Contribution:** analysis of new spillovers

Contribution to literature: part II

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- **Contribution:** analysis of new spillovers
- **Economics of crime:** relationship between alcohol consumption & crime
 - Anderson et al. (2018), Hansen (2015), Lindo et al. (2018), Markowitz and Grossman (1998), Tomé (2019)
- **Contribution:** identify small increase in alcohol consumption that does not correspond to an increase in violent crime

Map of smoking bans in bars



Data Source: American Nonsmokers' Rights Foundation

Map of county and state-level bar bans

Data: alcohol and cigarettes

- **American Nonsmokers' Rights Foundation**

- effective dates of bar & restaurant bans at city, county, & state level

Smoking ban provisions

- **Behavioral Risk Factor Surveillance System (BRFSS)**

- individual's smoking status & alcohol consumption

BRFSS representativeness

- **Nielsen Consumer Panel**

- household's alcohol for at-home consumption & cigarettes

Nielsen representativeness

Measurement error in alcohol consumption

- I do not directly observe location of alcohol consumption
 - purchases of off-premises alcohol = proxy for home alcohol consumption
 - could be consumed at BYOB restaurants
 - fine as long as change in BYOB prevalence uncorrelated w/smoking ban implementation
 - could be consumed at a house party
 - matters for externalities

Measurement error in alcohol consumption

- I do not directly observe location of alcohol consumption
 - purchases of off-premises alcohol = proxy for home alcohol consumption
 - could be consumed at BYOB restaurants
 - fine as long as change in BYOB prevalence uncorrelated w/smoking ban implementation
 - could be consumed at a house party
 - matters for externalities
- Social desirability bias
 - smoking and drinking are stigmatized in some social circles
- Recall bias
 - may not correctly remember alcohol consumption over past month

Summary statistics of alcohol consumption by smoking status (BRFSS, past 30 days)

Smoking Status	Overall (1)	Smoker (2)	Nonsmoker (3)	(2) - (3) (4)
Overall # Drinks (per month)	12.03	17.34	8.94	8.39***
<i>N</i>	516,064	189,934	326,130	
Extensive Margin percentage pts.	48.22	53.67	45.03	8.64***
<i>N</i>	517,610	191,047	326,563	
Intensive Margin # Drinks (per month) Drinking	24.08	32.68	19.41	13.27***
<i>N</i>	375,055	132,034	243,021	

Note: Column (4) represents the alcohol-related outcome for smokers minus the alcohol-related outcome for nonsmokers. *** denotes $p < 0.01$ for a t-test of the difference in means between smokers and nonsmokers (assuming unequal variances).

Smoking status disaggregated further

Data: alcohol-related externalities

- **Uniform Crime Reports (UCR)**
 - crimes reported to law enforcement

- **Fatality Analysis Reporting System (FARS)**
 - all fatal motor vehicle incidents on public roadways

Difference-in-differences method

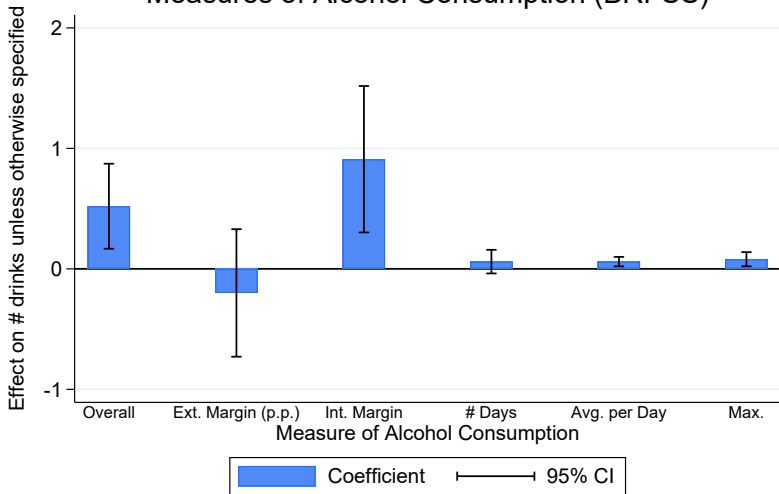
- **Identification strategy:** difference-in-differences using variation in effective dates of smoking bans in bars and restaurants at county level as identifying variation
- **Treatment variable:**
 - fraction of the county population that is subject to a smoking ban in bars and restaurants (incorporates city bans)

Reduced-form regression equation: alcohol

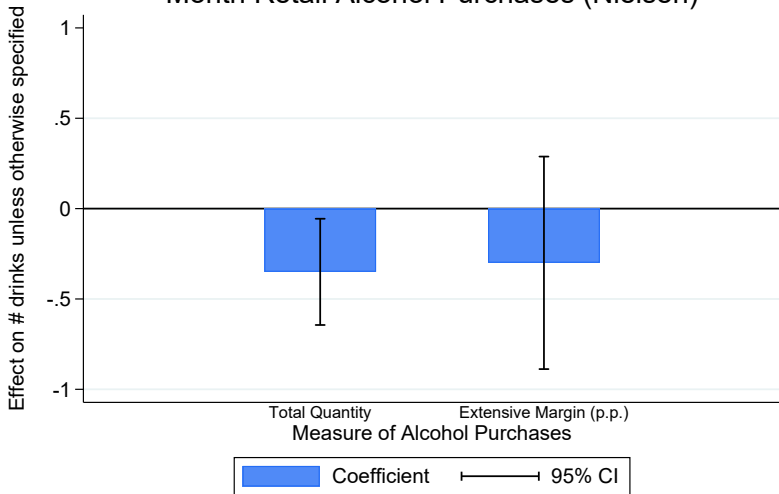
$$alc_{c,t} = \alpha^{alc} + \beta^{alc} \cdot BR\ ban_{c,t} + \mathbf{X}_{c,t} \cdot \gamma^{alc} + \delta_c^{alc} + \rho_t^{alc} + \varepsilon_{c,t}^{alc}$$

- $alc_{c,t}$: alcohol-related outcome in county c at time t
- $\mathbf{X}_{c,t}$: county-level demographics (percent male, Black, Asian, Hispanic, other race, age under 15, 15–24, 35–44, 45–64, 65+), state-level BAC limit, state cigarette tax, county-level restaurant-only smoking ban
 - omitted demographic categories: percent female, white, age 25–34
- δ_c^{alc} and ρ_t^{alc} : county and month-year FEs
- cluster standard errors ($\varepsilon_{c,t}$) at county level
- weight by county population

Effect of Bar and Restaurant Smoking Bans on Various Measures of Alcohol Consumption (BRFSS)



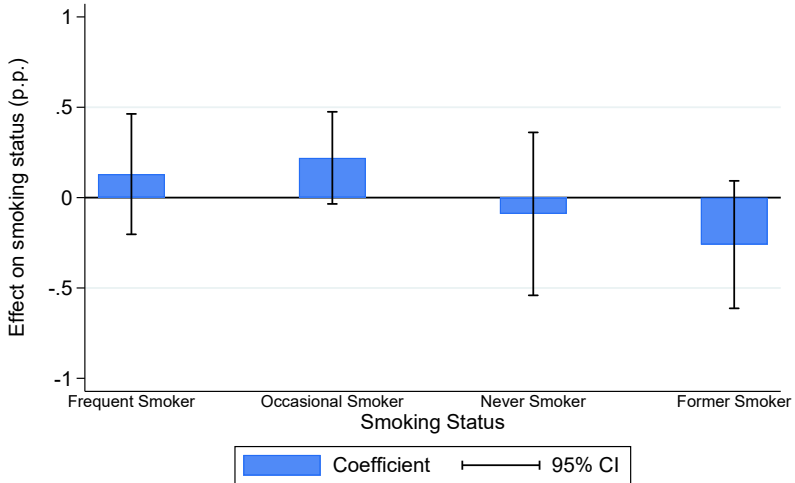
Effect of Bar and Restaurant Smoking Bans on Past-Month Retail Alcohol Purchases (Nielsen)



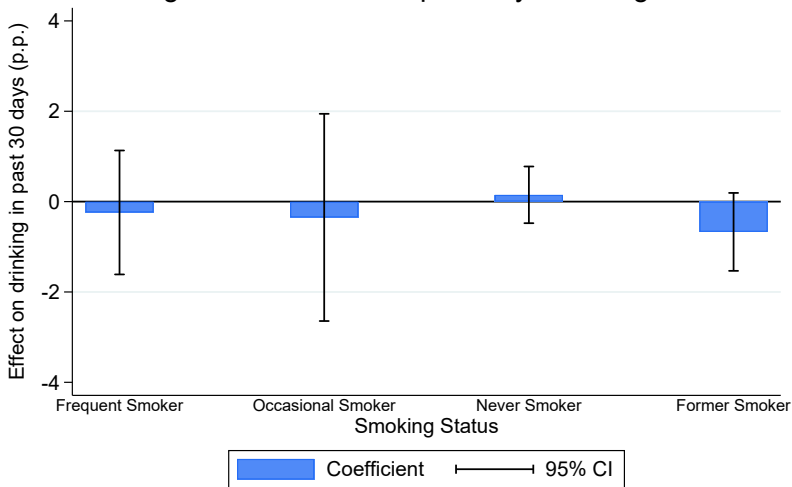
Potential endogeneity of smoking status

- Anti-smoking policies lead some people to quit smoking
 - e.g., Evans et al. (1999), Anger et al. (2011), Bharadwaj et al. (2014), DeCicca, Kenkel, & Lovenheim (2020), Kvasnicka et al. (2018)
- and prevent others from initiating smoking
 - Liu (2010)
- → **changes in composition of smoking status (frequent, occasional, never, former)**

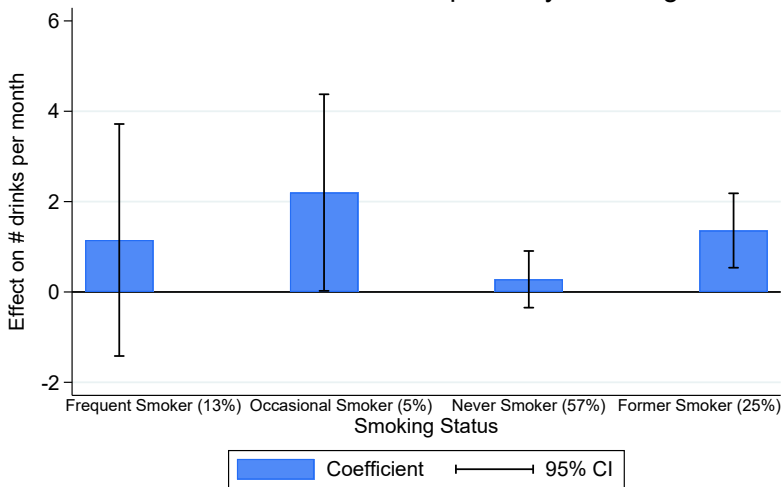
Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Smoking



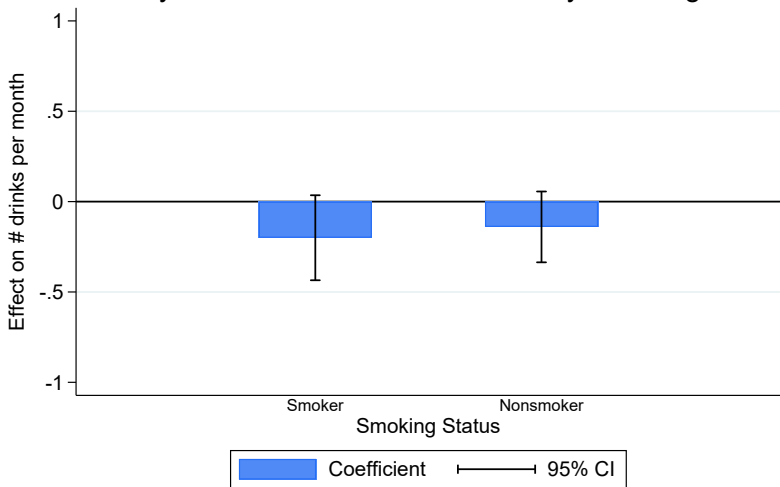
Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Alcohol Consumption, by Smoking Status



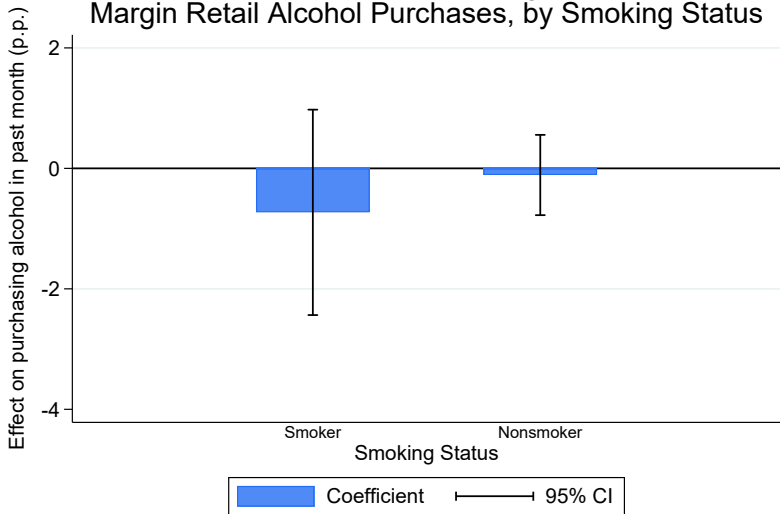
Effect of Bar and Restaurant Smoking Bans on Int.-Margin Past-Month Alcohol Consumption, by Smoking Status



Effect of Bar and Restaurant Smoking Bans on Past-Month Quantity of Retail Alcohol Purchases, by Smoking Status



Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Retail Alcohol Purchases, by Smoking Status



Effect of Bar and Restaurant Smoking Bans on Crimes per 10,000 People

Crime Type:	Violent	Murder	Rape	Aggravated Assault	Simple Assault
Bar and Restaurant Ban	-0.55	-0.01	0.05	-0.34	-0.82
(standard error)	(0.96)	(0.02)	(0.04)	(0.75)	(1.09)
[95% confidence interval]	[-2.43, 1.33]	[-0.05, 0.03]	[-0.04, 0.13]	[-1.81, 1.12]	[-2.96, 1.32]
Dependent Variable Mean	53.18	0.54	2.89	35.94	98.80
% of Mean	-1.03%	-2.27%	1.67%	-0.95%	0.83%
R^2	0.91	0.84	0.77	0.86	0.94
N	104,766	104,766	104,766	104,766	104,766

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Reduced-form regression equation: drunk driving

$$\log(dd_{c,t} + 1) = \alpha^{dd} + BR \text{ ban}_{c,t} \cdot \mathbb{I}\{smk\}_{c,t} \cdot \beta^{dd} + \mathbf{X}_{c,t} \cdot \gamma^{dd} + \delta_c^{dd} + \rho_t^{dd} + \varepsilon_{c,t}^{dd}$$

- $dd_{c,t}$: fatal drunk-driving crashes in county c at time t
- $\mathbb{I}\{smk\}_{c,t}$: indicators for high, medium, and low smoking prevalence
- $\mathbf{X}_{c,t}$: county-level demographics (percent male, Black, Asian, Hispanic, other race, age under 15, 15-24, 35-44, 45-64, 65+), state-level BAC limit, state cigarette tax, county-level restaurant-only smoking ban
- δ_c^{dd} and ρ_t^{dd} : county and month-year FEs
- cluster standard errors ($\varepsilon_{c,t}$) at county level
- weight by county population

Effect of Bar and Restaurant Smoking Bans on Log of Drunk-Driving Crashes

Smoking Prevalence	All	High Smoking	Medium Smoking	Low Smoking
Bar and Restaurant Ban	-0.00	0.04**	-0.02	-0.01
(standard error)	(0.01)	(0.02)	(0.02)	(0.02)
[95% confidence interval]	[-0.02, 0.02]	[0.01, 0.07]	[-0.05, 0.01]	[-0.04, 0.02]
R^2	0.70	0.70	0.70	0.70
N	339,264	339,264	339,264	339,264

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Alternative specifications and robustness checks

- Number of days spent drinking [Table](#)
- Average amount consumed per drinking day [Table](#)
- Maximum amount consumed on 1 occasion [Table](#)
- Only use state-level bans [Graph](#)
- Exclude city-level bans [Graph](#) [Table](#)
- Drinking by high-medium-low smoking prevalence [Table](#)
- Smoking by high-medium-low smoking prevalence [Table](#)

Conclusion

- Did people drink less in bars?
 - **No:** average \uparrow 1 drink per month; \uparrow 2.2 for occasional smokers, \uparrow 1.4 for former smokers
- External effects on violent crimes?
 - **No**
- Effects on drunk driving?
 - **Yes:** small increases in fatal drunk driving crashes in areas with high smoking prevalence (+4%)
- Optimal policy needs to anticipate the substitutability or complementarity of risky health behaviors

Next steps

- Conduct additional event studies
 - incorporate de Chaisemartin and D'Haultfoeuille (2018, 2020) estimators
- Test for heterogeneity in policy impacts
 - avoidance of bans by driving to nearby cities/counties
 - differential effects by geographic region
- Back-of-the-envelope cost-benefit analysis
 - compare benefits of secondhand smoke avoided to lives lost from drunk driving

Thank you!

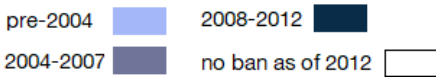
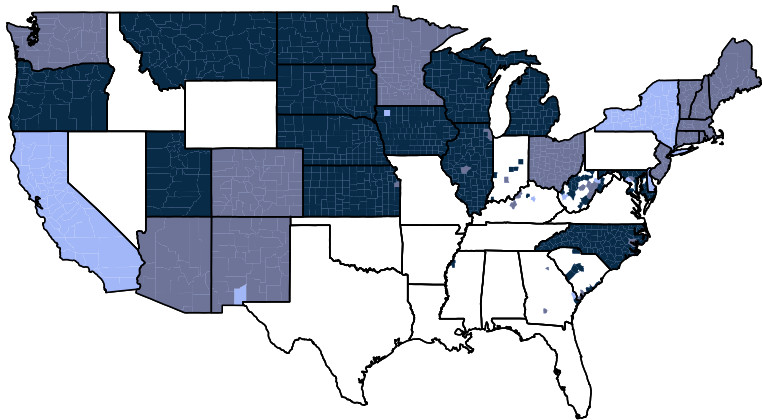
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Map of smoking bans in bars: excludes cities



Data Source: American Nonsmokers' Rights Foundation [Back](#)

State	Maine	North Carolina	North Dakota
Passed by	Legislature	Legislature	Voters
Enacted	Jun. 3, 2003	May 19, 2009	Nov. 6, 2012
Effective	Jan. 1, 2004	Jan. 2, 2010	Dec. 6, 2012
Enforced by	Attorney General	Local health director	Fire marshal Dept. of health & human services Office of Mgmt. & Budget
Penalty to business	Fine	Written notice	Fine
Penalty to smoker	Fine	Fine	Fine
Min. fine	None	None	None
Max 1 st violation	\$100	\$50	\$100
Max repeated violations	\$1500	\$50	\$200 \$500 for 3+

Sources: CDC STATE database; Legislative Record, House of Representatives, 121st Legislature, State of Maine; Maine Revised Statute Title 22, Chapter 262: Smoking; North Carolina General Statute Chapter 130A, Article 23: Smoking Prohibited in Public Places and Places of Employment; North Dakota Century Code Chapter 23-12: Public Health, Miscellaneous Provisions; Tobacco Prevention and Control Branch, North Carolina Department of Health and Human Services; Van Ells (2012).

Competing interests and effects of spatial heterogeneity were on people's minds from the beginning (from Maine Legislative Record)

Letter from owner of Dimillos Floating Restaurant:

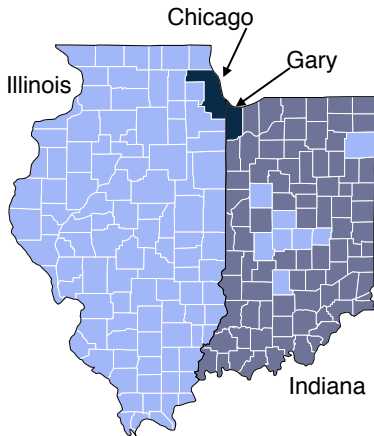
Not only did I misjudge the level of enjoyment my customers would take in the change to clean air, but I misjudged how important it was to my staff. I saw fewer missed days of work, fewer days of working despite colds and flu, better morale and some of my smoking employees were actually able to quit after many failed attempts in the past.... my business not only didn't suffer, but, in fact, improved with the new law in place.

Rep. Kane:

Many bar owners want to go smoke free, but they are afraid if they go smoke free and the bar down the street or across the street doesn't go smoke free, they are afraid of losing customers.

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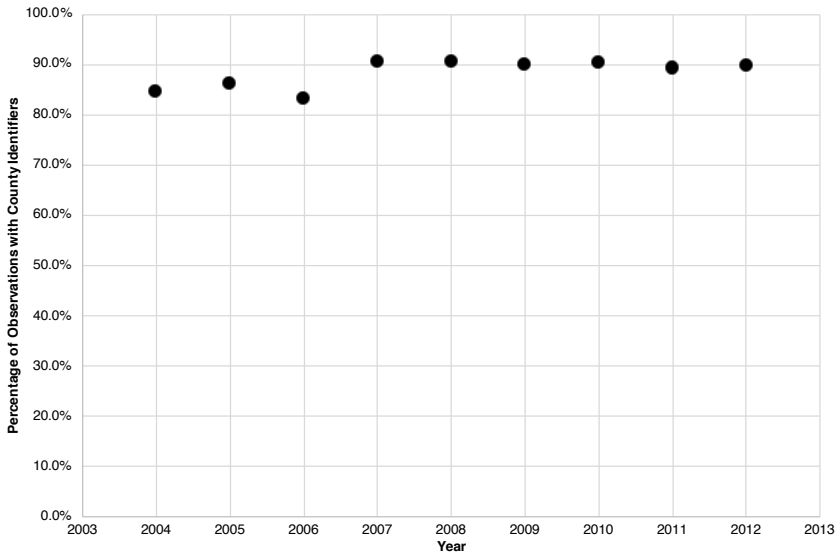
Spatial heterogeneity in laws



Data Source: American Nonsmokers' Rights Foundation

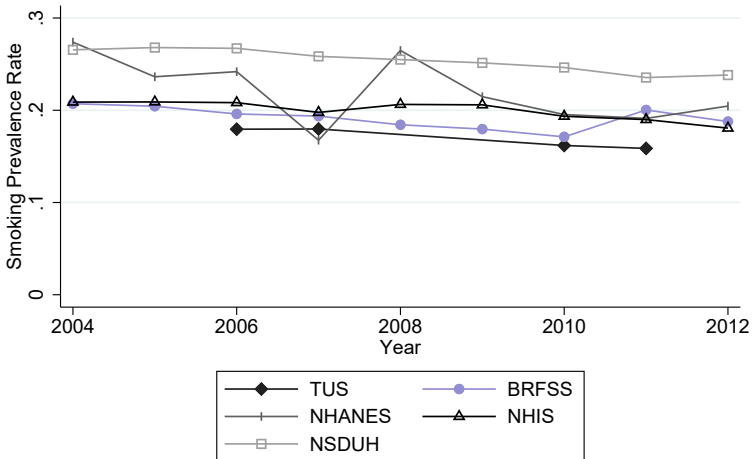
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Percentage of Behavioral Risk Factor Surveillance System (BRFSS) Observations with County Identifiers: 2004-2012



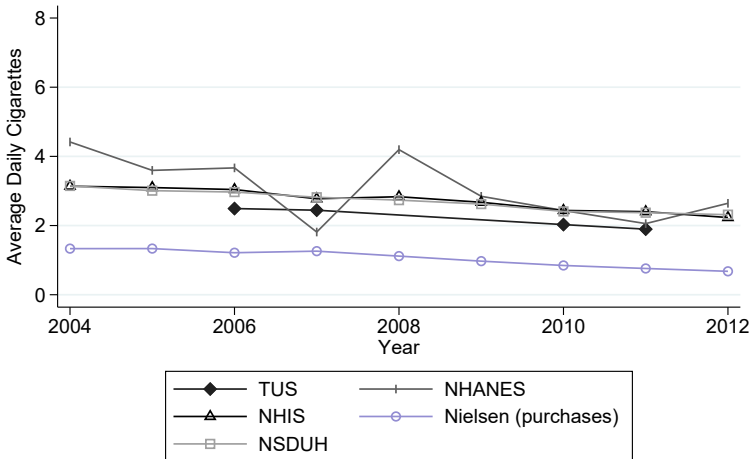
How representative is the BRFSS?

U.S. Adult Smoking Prevalence Rate: Various Datasets, 2004-2012



How representative is the Nielsen Consumer Panel?

U.S. Average Number of Cigarettes Smoked per Day, Including Zeroes: Various Datasets, 2004-2012



Summary statistics of alcohol consumption by smoking status (BRFSS, past 30 days)

Smoking Status	Extensive Margin	Intensive Margin
units	percentage pts.	# Drinks Drinking
All	53.19	21.91
<i>N</i>	189,791	161,421
Frequent	58.63	35.92
<i>N</i>	122,221	85,645
Occasional	64.74	27.88
<i>N</i>	68,756	46,161
Never	48.94	16.06
<i>N</i>	174,017	129,394
Former	57.72	22.78
<i>N</i>	152,539	113,598

Effect of Bar and Restaurant Smoking Bans on Alcohol Consumption (Past 30 Days, BRFSS)

	Overall	Extensive Margin	Intensive Margin	# Days	Avg. per Day	Max.
Bar & Restaurant Ban	0.52***	-0.20	0.91***	0.06	0.06***	0.08***
(standard error)	(0.18)	(0.27)	(0.31)	(0.05)	(0.02)	(0.03)
[95% confidence interval]	[0.18, 0.87]	[-0.72, 0.33]	[0.30, 1.52]	[-0.03, 0.16]	[0.01, 0.10]	[0.02, 0.14]
Dep. Var. Mean	11.66	53.19	21.91	8.36	2.41	3.51
% of Mean	4.48%	-0.37%	4.17%	0.73%	2.31%	2.25%
R^2	0.04	0.26	0.03	0.09	0.05	0.05
N	189,660	189,791	161,421	162,125	161,824	148,054

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

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Effect of Bar and Restaurant Smoking Bans on Off-Premises Alcohol Purchases (Past Month, Nielsen)

	Total Quantity	Extensive Margin
Bar & Restaurant Ban	-0.35**	-0.30
(standard error)	(0.15)	(0.30)
[95% confidence interval]	[-0.65, -0.06]	[-0.88, 0.29]
Dep. Var. Mean	5.33	25.78
% of Mean	-6.61%	-1.15%
R^2	0.36	0.40
N	280,632	280,632

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Reduced-form regression equation: smoking

$$smk_{s,c,t} = \alpha_s^{smk} + \beta_s^{smk} \cdot BR\ ban_{c,t} + \mathbf{X}_{c,t} \cdot \gamma_s^{smk} + \delta_{s,c}^{smk} + \rho_{s,t}^{smk} + \varepsilon_{s,c,t}^{smk}$$

- $smk_{s,c,t}$: proportion of individuals in county c at time t reporting smoking status as s
- $\mathbf{X}_{c,t}$: county-level demographics (percent male, Black, Asian, Hispanic, other race, age under 15, 15-24, 35-44, 45-64, 65+), state-level BAC limit, state cigarette tax, county-level restaurant-only smoking ban
 - omitted demographic categories: percent female, white, age 25-34
- $\delta_{s,c}^{smk}$ and $\rho_{s,t}^{smk}$: county and month-year FEs
- cluster standard errors ($\varepsilon_{s,c,t}$) at county level
- weight by county population

Effect of Bar and Restaurant Smoking Bans on Smoking Status

Smoking Status:	Frequent	Occasional	Never	Former
Bar and Restaurant Ban	0.13	0.22*	-0.09	-0.26
(standard error)	(0.17)	(0.13)	(0.23)	(0.18)
[95% confidence interval]	[-0.20, 0.45]	[-0.04, 0.48]	[-0.53, 0.36]	[-0.62, 0.10]
Dependent Variable Mean	13.04	5.25	56.60	25.10
% of Mean	0.98%	4.19%	-0.15%	-1.04%
R^2	0.11	0.03	0.12	0.07
N	190,096	190,096	190,096	190,096

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

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Reduced-form regression equation: alcohol

$$alc_{s,c,t} = \alpha_s^{alc} + \beta_s^{alc} \cdot BR\ ban_{c,t} + \mathbf{X}_{c,t} \cdot \gamma_s^{alc} + \delta_{s,c}^{alc} + \rho_{s,t}^{alc} + \varepsilon_{s,c,t}^{alc}$$

- $alc_{s,c,t}$: alcohol-related outcome for type s in county c at time t
- $\mathbf{X}_{c,t}$: county-level demographics (percent male, Black, Asian, Hispanic, other race, age under 15, 15-24, 35-44, 45-64, 65+), state-level BAC limit, state cigarette tax, county-level restaurant-only smoking ban
 - omitted demographic categories: percent female, white, age 25-34
- $\delta_{s,c}^{alc}$ and $\rho_{s,t}^{alc}$: county and month-year FEs
- cluster standard errors ($\varepsilon_{s,c,t}$) at county level
- weight by county population

Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Past-Month Alcohol Consumption

Smoking Status:	Frequent	Occasional	Never	Former
Bar and Restaurant Ban	-0.24	-0.35	0.15	-0.67
(standard error)	(0.70)	(1.17)	(0.32)	(0.44)
[95% confidence interval]	[-1.61, 1.13]	[-2.63, 1.94]	[-0.48, 0.77]	[-1.54, 0.19]
Dependent Variable Mean	58.63	64.74	48.94	57.72
% of Mean	-0.41%	-0.53%	0.30%	-1.16%
<i>R</i> ²	0.07	0.07	0.22	0.16
<i>N</i>	122,221	68,756	174,017	152,539

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Effect of Bar and Restaurant Smoking Bans on Intensive-Margin Past-Month Alcohol Consumption

Smoking Status:	Frequent	Occasional	Never	Former
Bar and Restaurant Ban	1.15	2.20**	0.28	1.36***
(standard error)	(1.31)	(1.11)	(0.32)	(0.42)
[95% confidence interval]	[-1.43, 3.72]	[0.02, 4.39]	[-0.35, 0.91]	[0.55, 2.18]
Dependent Variable Mean	35.92	27.88	16.06	22.78
% of Mean	3.19%	7.91%	1.73%	5.99%
<i>R</i> ²	0.03	0.03	0.03	0.03
<i>N</i>	85,645	46,161	129,394	113,598

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Effect of Bar and Restaurant Smoking Bans on Total Quantity of Off-Premises Alcohol Purchases

Smoking Status:	Smoker	Nonsmoker
Bar and Restaurant Ban	-0.20*	-0.14
(standard error)	(0.12)	(0.10)
[95% confidence interval]	[-0.43, 0.03]	[-0.35, 0.06]
Dependent Variable Mean	1.92	3.52
% of Mean	-10.33%	-4.00%
R^2	0.32	0.34
N	198,570	267,973

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Off-Premises Alcohol Purchases

Smoking Status:	Smoker	Nonsmoker
Bar and Restaurant Ban	-0.73	-0.11
(standard error)	(0.87)	(0.34)
[95% confidence interval]	[-2.44, 0.98]	[-0.79, 0.56]
Dependent Variable Mean	31.54	24.35
% of Mean	-2.31%	-0.46%
R^2	0.27	0.37
N	198,570	267,973

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Effect of Bar and Restaurant Smoking Bans on Number of Days Spent Drinking in Past 30 Days (Conditional on Drinking)

Smoking Status:	Frequent	Occasional	Never	Former
Bar and Restaurant Ban	0.03	0.28	0.03	0.06
(standard error)	(0.14)	(0.18)	(0.06)	(0.09)
[95% confidence interval]	[-0.25, 0.31]	[-0.07, 0.63]	[-0.09, 0.14]	[-0.12, 0.25]
Dependent Variable Mean	9.76	8.55	7.18	10.20
% of Mean	0.29%	3.28%	0.37%	0.60%
R^2	0.04	0.05	0.08	0.06
N	86,904	46,853	130,017	114,293

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Demographic controls are the percentages of the county population that is male, Hispanic, non-Hispanic black, non-Hispanic Asian, non-Hispanic non-white other racial groups, younger than 15, 15 to 24, 35 to 44, 45 to 64, and 65 or older. The omitted categories for the demographic controls are the percentage female, percentage white, and percentage aged 25 to 34. Policy controls are (1) an indicator for a law mandating the BAC limit for driving under the influence is 0.08, and (2) the state cigarette tax per pack. Controls also include county and month-year fixed effects. Standard errors are clustered at the county level. Regressions are probability weighted using the county population.

Effect of Bar and Restaurant Smoking Bans on Average Alcohol Consumption per Drinking Day (Conditional on Drinking)

Smoking Status:	Frequent	Occasional	Never	Former
Bar and Restaurant Ban	0.03	0.07	0.03	0.10***
(standard error)	(0.08)	(0.08)	(0.02)	(0.03)
[95% confidence interval]	[-0.12, 0.18]	[-0.08, 0.22]	[-0.02, 0.07]	[0.05, 0.15]
Dependent Variable Mean	3.26	3.10	2.07	2.16
% of Mean	0.85%	2.15%	1.21%	4.72%
R^2	0.04	0.05	0.04	0.04
N	86,162	46,568	129,767	114,055

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Demographic controls are the percentages of the county population that is male, Hispanic, non-Hispanic black, non-Hispanic Asian, non-Hispanic non-white other racial groups, younger than 15, 15 to 24, 35 to 44, 45 to 64, and 65 or older. The omitted categories for the demographic controls are the percentage female, percentage white, and percentage aged 25 to 34. Policy controls are (1) an indicator for a law mandating the BAC limit for driving under the influence is 0.08, and (2) the state cigarette tax per pack. Controls also include county and month-year fixed effects. Standard errors are clustered at the county level. Regressions are probability weighted using the county population.

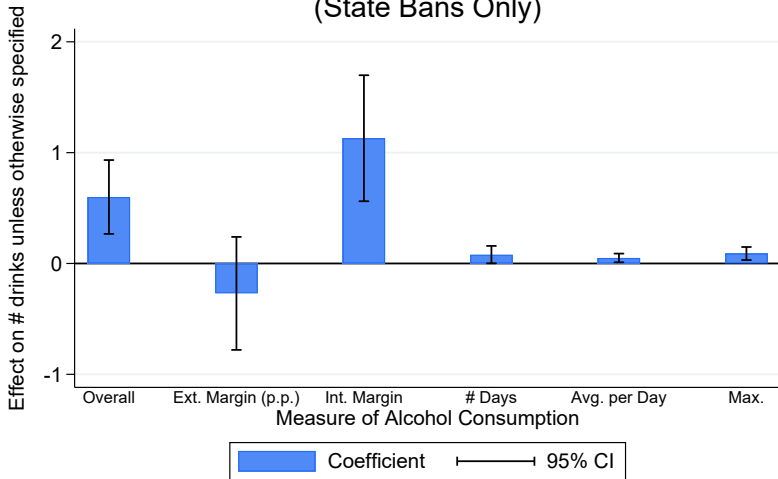
Effect of Bar and Restaurant Smoking Bans on Maximum Alcohol Consumption on 1 Occasion (Conditional on Drinking)

Smoking Status:	Frequent	Occasional	Never	Former
Bar and Restaurant Ban	0.08	0.01	0.02	0.09**
(standard error)	(0.11)	(0.10)	(0.03)	(0.04)
[95% confidence interval]	[-0.14, 0.31]	[-0.19, 0.21]	[-0.04, 0.07]	[0.02, 0.16]
Dependent Variable Mean	4.83	4.67	2.96	3.19
% of Mean	1.75%	0.22%	0.61%	2.80%
R^2	0.04	0.06	0.04	0.04
N	76,671	41,170	117,972	103,746

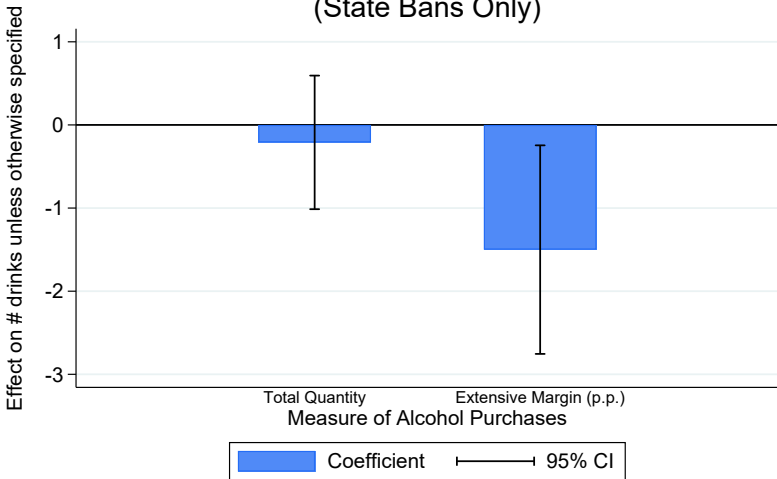
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Demographic controls are the percentages of the county population that is male, Hispanic, non-Hispanic black, non-Hispanic Asian, non-Hispanic non-white other racial groups, younger than 15, 15 to 24, 35 to 44, 45 to 64, and 65 or older. The omitted categories for the demographic controls are the percentage female, percentage white, and percentage aged 25 to 34. Policy controls are (1) an indicator for a law mandating the BAC limit for driving under the influence is 0.08, and (2) the state cigarette tax per pack. Controls also include county and month-year fixed effects. Standard errors are clustered at the county level. Regressions are probability weighted using the county population.

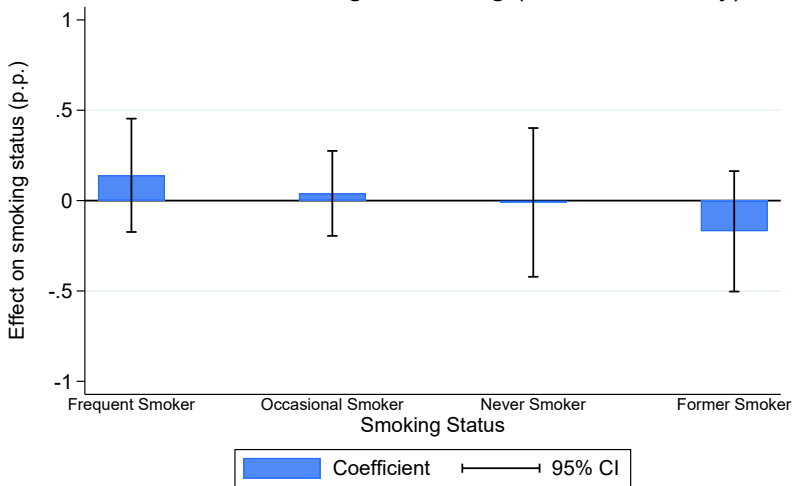
Effect of Bar and Restaurant Smoking Bans on Various Measures of Alcohol Consumption (BRFSS) (State Bans Only)



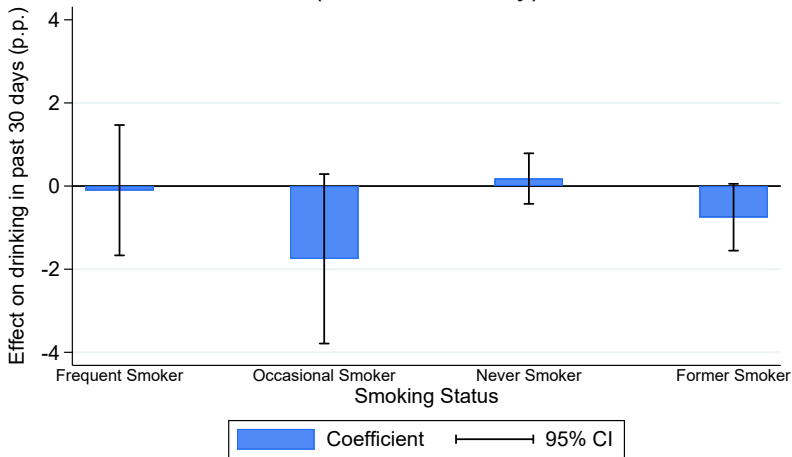
Effect of Bar and Restaurant Smoking Bans on Past-Month Retail Alcohol Purchases (Nielsen) (State Bans Only)



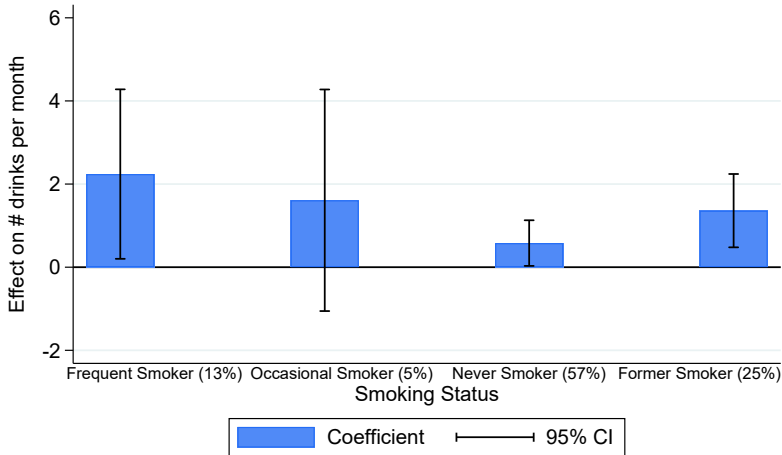
Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Smoking (State Bans Only)



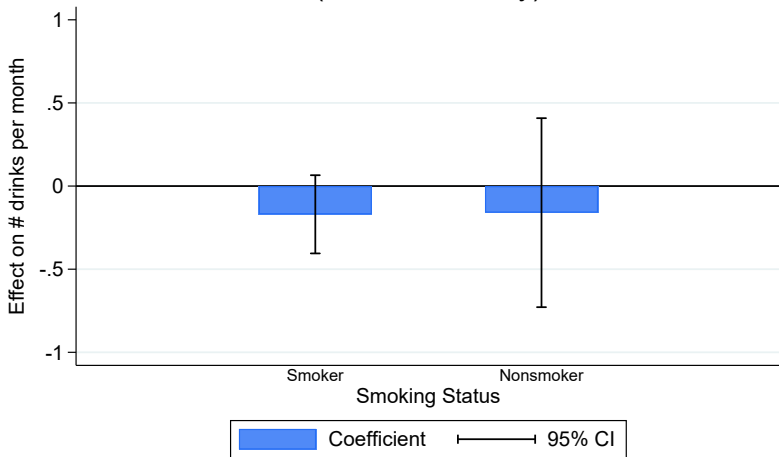
Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Alcohol Consumption, by Smoking Status (State Bans Only)



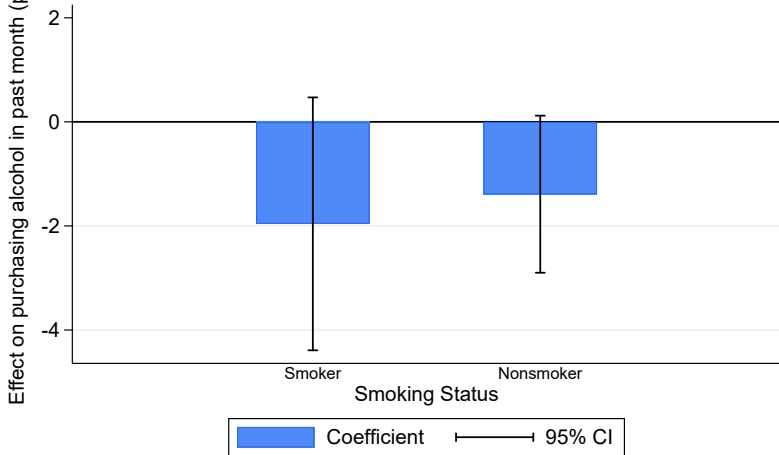
Effect of Bar and Restaurant Smoking Bans on Intensive-Margin Past-Month Alcohol Consumption, by Smoking Status (State Bans Only)



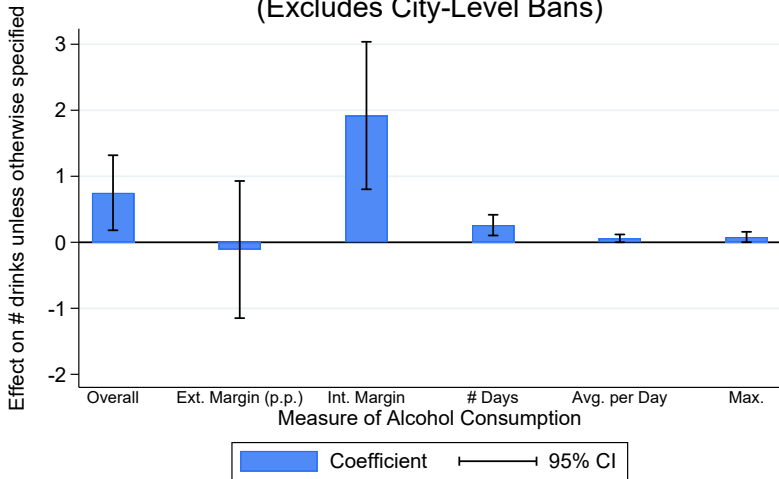
Effect of Bar and Restaurant Smoking Bans on Past-Month Quantity of Retail Alcohol Purchases, by Smoking Status (State Bans Only)



Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Retail Alcohol Purchases, by Smoking Status (State Bans Only)



Effect of Bar and Restaurant Smoking Bans on Various Measures of Alcohol Consumption (Excludes City-Level Bans)



Effect of Bar and Restaurant Smoking Bans on Alcohol Consumption (Past 30 Days, BRFSS; Excludes City-Level Bans)

	Overall	Extensive Margin	Intensive Margin	# Days	Avg. per Day	Max.
Bar & Restaurant Ban	0.75***	-0.11	1.92***	0.26***	0.06**	0.08**
(standard error)	(0.29)	(0.53)	(0.57)	(0.08)	(0.03)	(0.04)
[95% confidence interval]	[0.19, 1.32]	[-1.16, 0.93]	[0.81, 3.04]	[0.10, 0.41]	[0.01, 0.12]	[0.01, 0.15]
Dep. Var. Mean	11.66	53.19	21.91	8.36	2.41	3.51
% of Mean	6.45%	-0.21%	8.78%	3.09%	2.65%	2.35%
R^2	0.04	0.26	0.03	0.09	0.05	0.05
N	189,660	189,791	161,421	162,125	161,824	148,054

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Demographic controls are the percentages of the county population that is male, Hispanic, non-Hispanic black, non-Hispanic Asian, non-Hispanic non-white other racial groups, younger than 15, 15 to 24, 35 to 44, 45 to 64, and 65 or older. The omitted categories for the demographic controls are the percentage female, percentage white, and percentage aged 25 to 34. Policy controls are (1) an indicator for a law mandating the BAC limit for driving under the influence is 0.08, and (2) the state cigarette tax per pack. Controls also include county and month-year fixed effects. Standard errors are clustered at the county level. Regressions are probability weighted using the county population.

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Effect of Bar and Restaurant Smoking Bans on Off-Premises Alcohol Purchases (Past Month, Nielsen; Excludes City-Level Bans)

	Total Quantity	Extensive Margin
Bar & Restaurant Ban	-0.32	-1.00**
(standard error)	(0.29)	(0.48)
[95% confidence interval]	[-0.89, 0.26]	[-1.94, -0.07]
Dep. Var. Mean	5.33	25.78
% of Mean	-5.92%	-3.89%
R^2	0.36	0.40
N	280,632	280,632

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Demographic controls are the percentages of the county population that is male, Hispanic, non-Hispanic black, non-Hispanic Asian, non-Hispanic non-white other racial groups, younger than 15, 15 to 24, 35 to 44, 45 to 64, and 65 or older. The omitted categories for the demographic controls are the percentage female, percentage white, and percentage aged 25 to 34. Policy controls are (1) an indicator for a law mandating the BAC limit for driving under the influence is 0.08, and (2) the state cigarette tax per pack. Controls also include county and month-year fixed effects. Standard errors are clustered at the county level. Regressions are probability weighted using the county population.

Effect of Bar and Restaurant Smoking Bans on Smoking Status (Excludes City-Level Bans)

Smoking Status:	Frequent	Occasional	Never	Former
Bar and Restaurant Ban	-0.03	0.28*	-0.14	-0.11
(standard error)	(0.27)	(0.16)	(0.33)	(0.26)
[95% confidence interval]	[-0.56, 0.50]	[-0.04, 0.59]	[-0.79, 0.51]	[-0.62, 0.40]
Dependent Variable Mean	13.04	5.25	56.60	25.10
% of Mean	0.23%	5.29%	-0.24%	-0.44%
R^2	0.11	0.03	0.12	0.07
N	190,096	190,096	190,096	190,096

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Demographic controls are the percentages of the county population that is male, Hispanic, non-Hispanic black, non-Hispanic Asian, non-Hispanic non-white other racial groups, younger than 15, 15 to 24, 35 to 44, 45 to 64, and 65 or older. The omitted categories for the demographic controls are the percentage female, percentage white, and percentage aged 25 to 34. Policy controls are (1) an indicator for a law mandating the BAC limit for driving under the influence is 0.08, and (2) the state cigarette tax per pack. Controls also include county and month-year fixed effects. Standard errors are clustered at the county level. Regressions are probability weighted using the county population.

Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Past-Month Alcohol Consumption (Excludes City-Level Bans)

Smoking Status:	Frequent	Occasional	Never	Former
Bar and Restaurant Ban	-0.07	-0.32	0.20	-0.51
(standard error)	(1.07)	(1.82)	(0.62)	(0.69)
[95% confidence interval]	[-2.17, 2.03]	[-3.90, 3.26]	[-1.02, 1.41]	[-1.85, 0.84]
Dependent Variable Mean	58.63	64.74	48.94	57.72
% of Mean	-0.12%	-0.49%	0.40%	-0.88%
R^2	0.07	0.07	0.22	0.16
N	122,221	68,756	174,017	152,539

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Demographic controls are the percentages of the county population that is male, Hispanic, non-Hispanic black, non-Hispanic Asian, non-Hispanic non-white other racial groups, younger than 15, 15 to 24, 35 to 44, 45 to 64, and 65 or older. The omitted categories for the demographic controls are the percentage female, percentage white, and percentage aged 25 to 34. Policy controls are (1) an indicator for a law mandating the BAC limit for driving under the influence is 0.08, and (2) the state cigarette tax per pack. Controls also include county and month-year fixed effects. Standard errors are clustered at the county level. Regressions are probability weighted using the county population.

Effect of Bar and Restaurant Smoking Bans on Intensive-Margin Past-Month Alcohol Consumption (Excludes City-Level Bans)

Smoking Status:	Frequent	Occasional	Never	Former
Bar and Restaurant Ban	3.61	5.41**	1.09**	1.08
(standard error)	(2.34)	(2.55)	(0.49)	(0.85)
[95% confidence interval]	[-0.98, 8.20]	[0.41, 10.40]	[0.14, 2.04]	[-0.59, 2.75]
Dependent Variable Mean	35.92	27.88	16.06	22.78
% of Mean	10.05%	19.40%	6.79%	4.74%
R^2	0.03	0.04	0.03	0.03
N	85,645	46,161	129,394	113,598

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Demographic controls are the percentages of the county population that is male, Hispanic, non-Hispanic black, non-Hispanic Asian, non-Hispanic non-white other racial groups, younger than 15, 15 to 24, 35 to 44, 45 to 64, and 65 or older. The omitted categories for the demographic controls are the percentage female, percentage white, and percentage aged 25 to 34. Policy controls are (1) an indicator for a law mandating the BAC limit for driving under the influence is 0.08, and (2) the state cigarette tax per pack. Controls also include county and month-year fixed effects. Standard errors are clustered at the county level. Regressions are probability weighted using the county population.

Effect of Bar and Restaurant Smoking Bans on Total Quantity of Alcohol Purchases (Excludes City-Level Bans)

Smoking Status:	Smoker	Nonsmoker
Bar and Restaurant Ban	-0.13	-0.16
(standard error)	(0.26)	(0.20)
[95% confidence interval]	[-0.64, 0.39]	[-0.56, 0.23]
Dependent Variable Mean	1.92	3.52
% of Mean	-6.77%	-4.55%
R^2	0.32	0.34
N	198,570	267,973

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Demographic controls are the percentages of the county population that is male, Hispanic, non-Hispanic black, non-Hispanic Asian, non-Hispanic non-white other racial groups, younger than 15, 15 to 24, 35 to 44, 45 to 64, and 65 or older. The omitted categories for the demographic controls are the percentage female, percentage white, and percentage aged 25 to 34. Policy controls are (1) an indicator for a law mandating the BAC limit for driving under the influence is 0.08, and (2) the state cigarette tax per pack. Controls also include county and month-year fixed effects. Standard errors are clustered at the county level. Regressions are probability weighted using the county population.

Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Alcohol Purchases (Excludes City-Level Bans)

Smoking Status:	Smoker	Nonsmoker
Bar and Restaurant Ban	-2.25**	-1.07*
(standard error)	(1.03)	(0.59)
[95% confidence interval]	[-4.26, -0.24]	[-2.23, 0.09]
Dependent Variable Mean	31.54	24.35
% of Mean	-7.13%	-4.39%
<i>R</i> ²	0.27	0.37
<i>N</i>	198,570	267,973

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Note: Demographic controls are the percentages of the county population that is male, Hispanic, non-Hispanic black, non-Hispanic Asian, non-Hispanic non-white other racial groups, younger than 15, 15 to 24, 35 to 44, 45 to 64, and 65 or older. The omitted categories for the demographic controls are the percentage female, percentage white, and percentage aged 25 to 34. Policy controls are (1) an indicator for a law mandating the BAC limit for driving under the influence is 0.08, and (2) the state cigarette tax per pack. Controls also include county and month-year fixed effects. Standard errors are clustered at the county level. Regressions are probability weighted using the county population.

Effect of Bar and Restaurant Smoking Bans on Alcohol Consumption, by Smoking Prevalence

	Overall	Extensive Margin	Intensive Margin	# Days	Avg. per Day	Max.
Bar & Restaurant Ban	0.58	0.11	0.98	0.02	0.08**	0.13**
High smoking	(0.39)	(0.51)	(0.70)	(0.10)	(0.04)	(0.05)
[95% confidence interval]	[-0.18 - 1.34]	[-0.89 - 1.11]	[-0.39 - 2.35]	[-0.17 - 0.21]	[0.00 - 0.15]	[0.03 - 0.23]
Bar & Restaurant Ban	0.18	-0.57	0.41	-0.00	0.04	0.07*
Medium smoking	(0.22)	(0.42)	(0.36)	(0.06)	(0.03)	(0.04)
[95% confidence interval]	[-0.25 - 0.61]	[-1.39 - 0.25]	[-0.30 - 1.13]	[-0.12 - 0.11]	[-0.02 - 0.09]	[-0.00 - 0.14]
Bar & Restaurant Ban	1.02***	0.16	1.64***	0.19***	0.07**	0.05
Low smoking	(0.23)	(0.33)	(0.37)	(0.06)	(0.03)	(0.04)
[95% confidence interval]	[0.56 - 1.48]	[-0.49 - 0.82]	[0.92 - 2.36]	[0.07 - 0.31]	[0.02 - 0.12]	[-0.03 - 0.12]
R^2	0.04	0.26	0.03	0.09	0.05	0.05
N	189,660	189,791	161,421	162,125	161,824	148,054

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Past-Month Alcohol Consumption, by Smoking Prevalence

Smoking Status:	Frequent	Occasional	Never	Former
Bar & Restaurant Ban	-0.93	2.18	0.69	-0.39
High smoking	(1.40)	(1.73)	(0.54)	(0.82)
[95% confidence interval]	[-3.67 - 1.81]	[-1.21 - 5.56]	[-1.37 - 1.75]	[-2.01 - 1.22]
Bar & Restaurant Ban	-0.79	-1.02	-0.12	-0.92
Medium smoking	(1.12)	(1.75)	(0.43)	(0.66)
[95% confidence interval]	[-3.00 - 1.41]	[-4.46 - 2.42]	[-0.97 - 0.72]	[-2.21 - 0.37]
Bar & Restaurant Ban	1.15	-1.02	0.15	-0.51
Low smoking	(0.76)	(1.42)	(0.43)	(0.49)
[95% confidence interval]	[-0.34 - 2.63]	[-3.81 - 1.76]	[-0.68 - 0.99]	[-1.46 - 0.45]
<i>R</i> ²	0.07	0.07	0.22	0.16
<i>N</i>	122,221	68,756	174,017	152,539

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Effect of Bar and Restaurant Smoking Bans on Intensive-Margin Past-Month Alcohol Consumption, by Smoking Prevalence

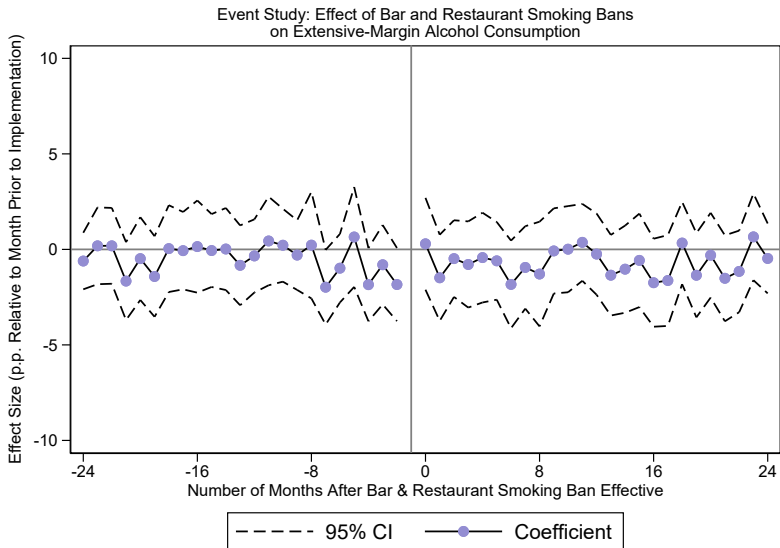
Smoking Status:	Frequent	Occasional	Never	Former
Bar & Restaurant Ban	-0.94	0.25	0.41	2.50***
High smoking	(2.62)	(2.11)	(0.76)	(0.68)
[95% confidence interval]	[-6.08 - 4.20]	[-3.88 - 4.38]	[-1.07 - 1.90]	[1.17 - 3.83]
Bar & Restaurant Ban	0.15	2.36*	-0.08	1.35*
Medium smoking	(1.47)	(1.35)	(0.41)	(0.64)
[95% confidence interval]	[-2.73 - 3.04]	[-0.29 - 5.02]	[-0.88 - 0.72]	[-0.02 - 2.51]
Bar & Restaurant Ban	4.15***	3.15*	0.70**	0.76*
Low smoking	(1.50)	(1.86)	(0.34)	(0.43)
[95% confidence interval]	[1.21 - 7.09]	[-0.49 - 6.79]	[0.04 - 1.35]	[-0.10 - 1.61]
<i>R</i> ²	0.03	0.04	0.03	0.03
<i>N</i>	85,645	46,161	129,394	113,598

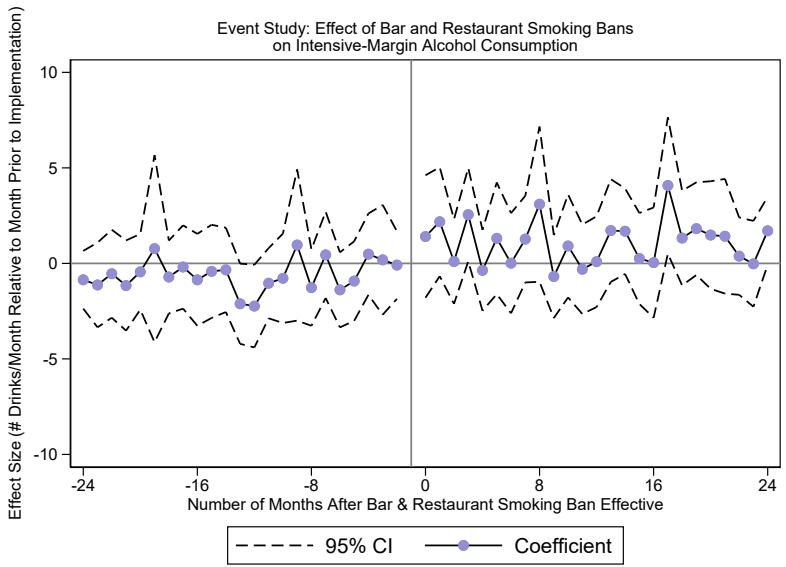
* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Effect of Bar and Restaurant Smoking Bans on Smoking, by Smoking Prevalence

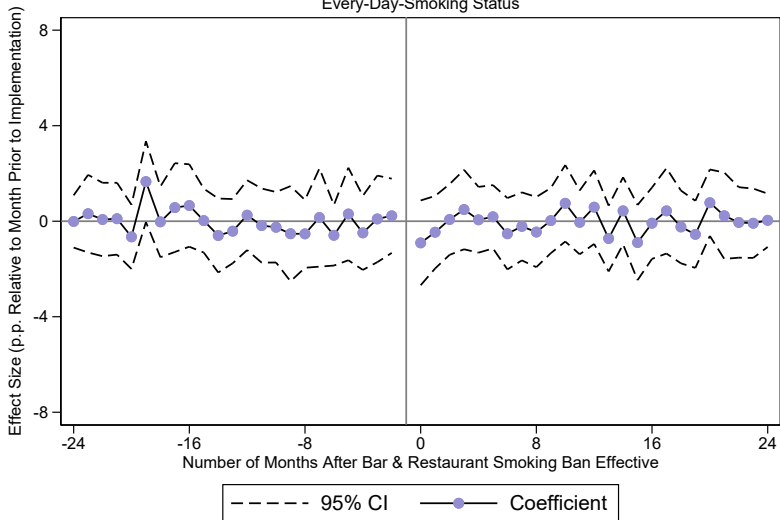
	Frequent	Occasional	Never	Former
Bar & Restaurant Ban				
High smoking	-0.02	0.31	0.17	-0.46
[95% confidence interval]	(0.28) [-0.57 - 0.54]	(0.24) [-0.17 - 0.78]	(0.44) [-0.69 - 1.04]	(0.40) [-1.25 - 0.33]
Bar & Restaurant Ban				
Medium smoking	0.26	0.30*	-0.35	-0.21
[95% confidence interval]	(0.25) [-0.23 - 0.75]	(0.18) [-0.05 - 0.66]	(0.28) [-0.91 - 0.21]	(0.23) [-0.67 - 0.24]
Bar & Restaurant Ban				
Low smoking	0.02	0.02	0.13	-0.17
[95% confidence interval]	(0.21) [-0.39 - 0.42]	(0.13) [-0.24 - 0.28]	(0.31) [-0.48 - 0.74]	(0.24) [-0.63 - 0.30]
R^2	0.11	0.03	0.12	0.07
N	190,096	190,096	190,096	190,096

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

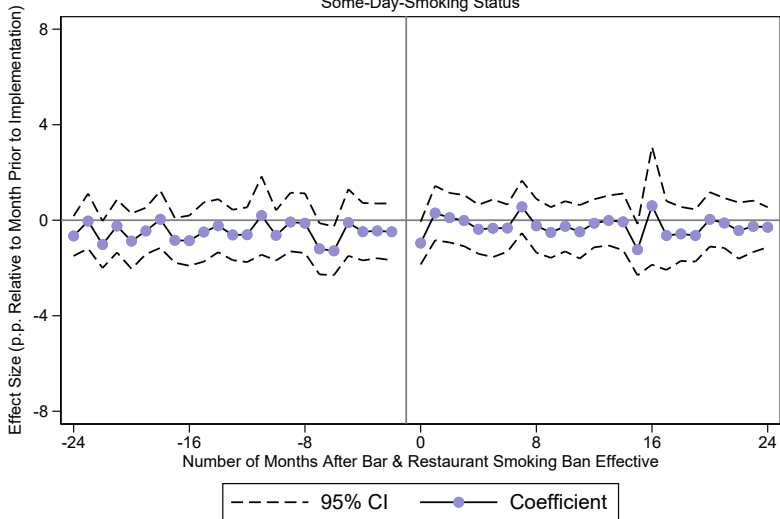




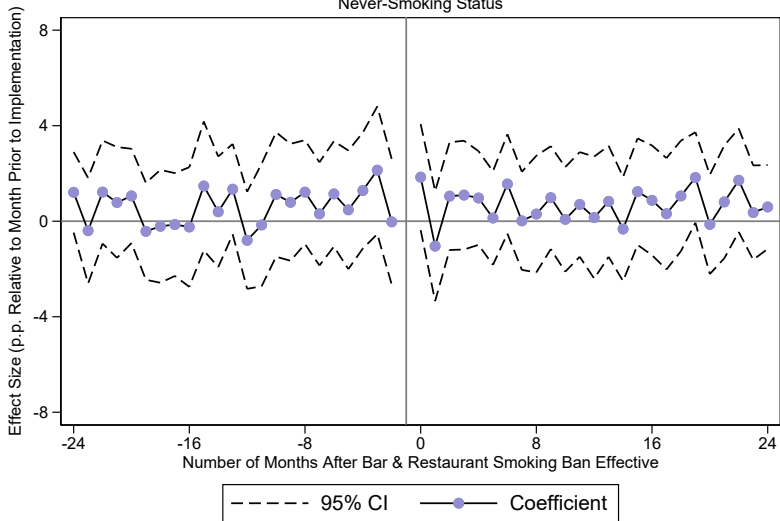
Event Study: Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Smoking Every-Day-Smoking Status



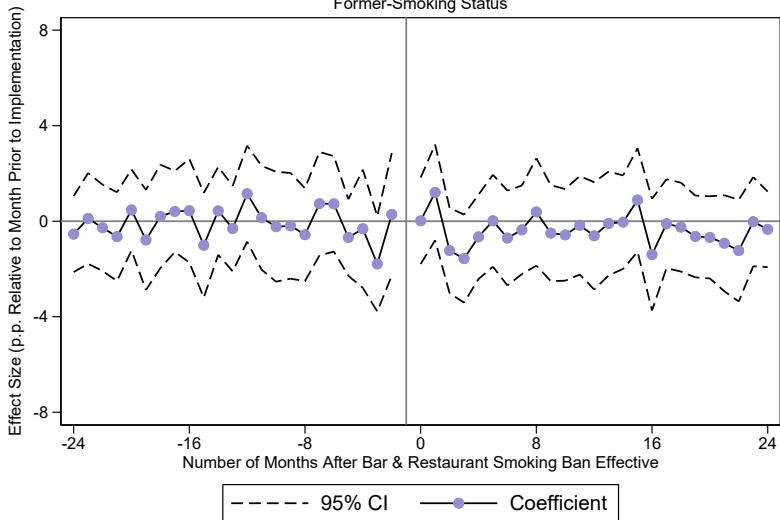
Event Study: Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Smoking Some-Day-Smoking Status



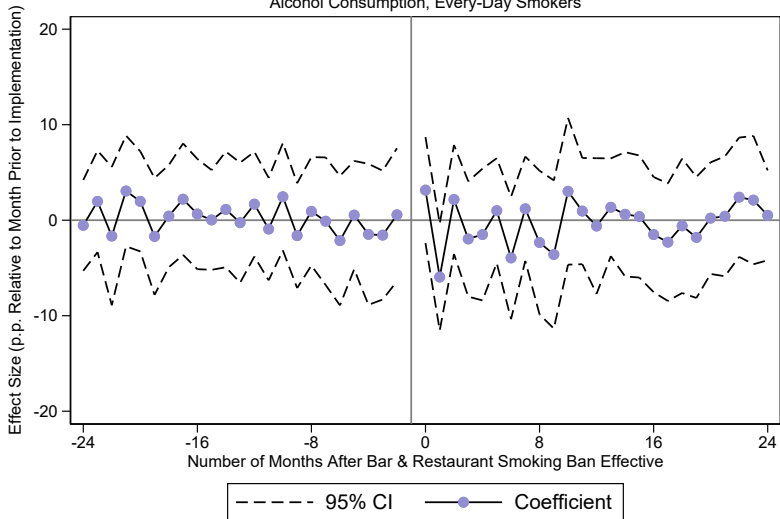
Event Study: Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Smoking Never-Smoking Status



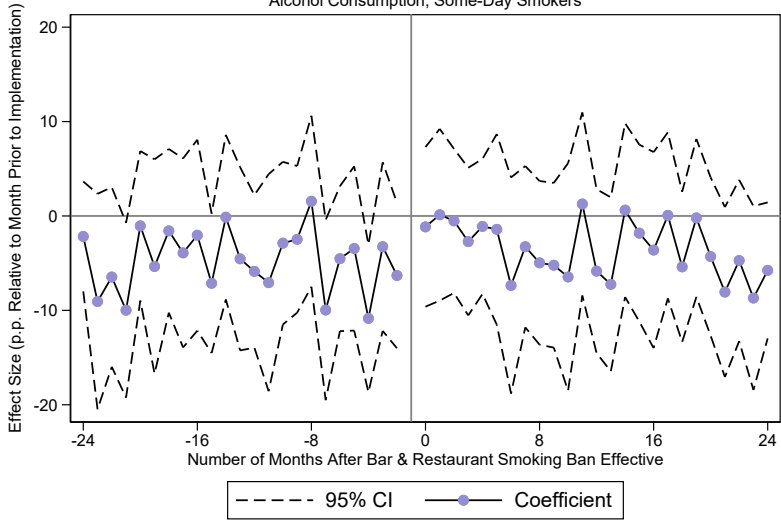
Event Study: Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Smoking
Former-Smoking Status



Event Study: Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Alcohol Consumption, Every-Day Smokers

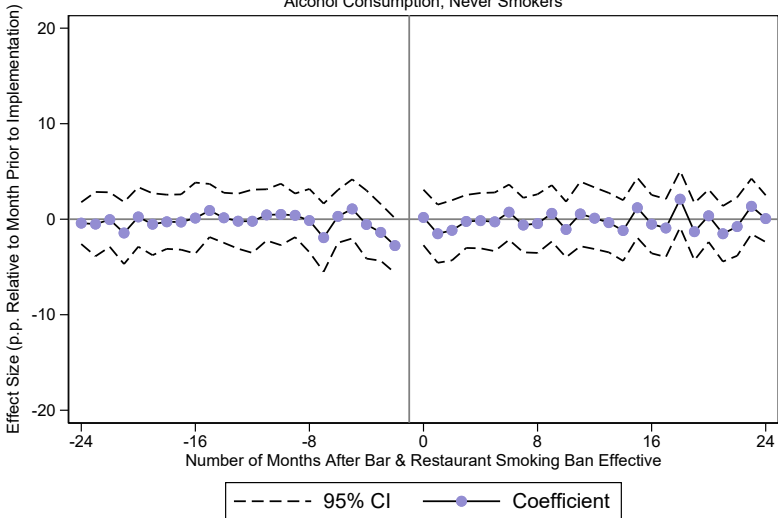


Event Study: Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Alcohol Consumption, Some-Day Smokers

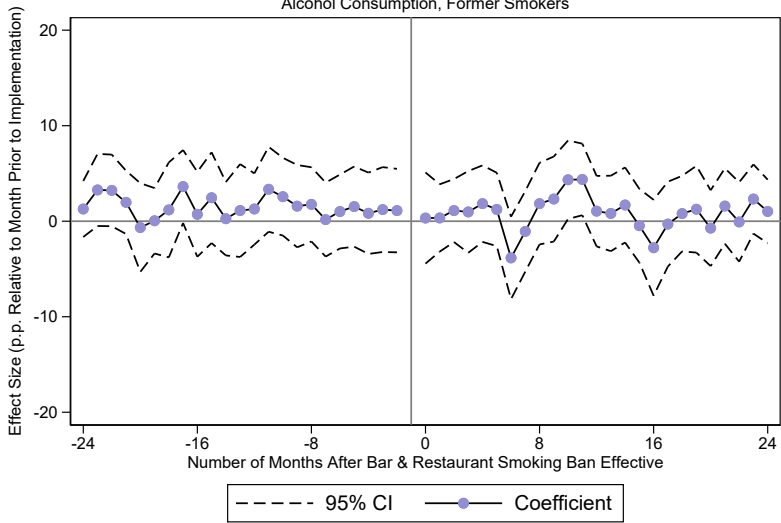


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Event Study: Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Alcohol Consumption, Never Smokers



Event Study: Effect of Bar and Restaurant Smoking Bans on Extensive-Margin Alcohol Consumption, Former Smokers



Event Study: Effect of Bar and Restaurant Smoking Bans on Intensive-Margin Alcohol Consumption, Every-Day Smokers

