How do Smoking Bans in Bars/Restaurants Affect Alcohol Consumption?

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Preliminary Results - Please do not cite

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OBJECTIVE

To analyze the effects of smoking bans on alcohol consumption at the restaurants

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INTRODUCTION

- As more states consider smoking bans, it is necessary to analyze their economic impacts.
- If cigarette and alcohol are related in consumption, as suggested by some studies, smoking bans can affect alcohol consumption too.
- Particularly, smoking bans in bars/restaurants created a natural experiment to examine the relationship between smoking and drinking.
- We employ a rational addiction framework to analyze the effect of smoking bans on alcohol consumption in bars/restaurants.
- We use a pseudo panel data approach.
- Pseudo panel is disaggregated enough, and it has main advantages compared with panel data:
  - It avoids attrition problem.
  - It eliminates difficulties of censoring.
  - It has less bias due to measurement error as we are working with a group average.

DATA

- 2002-2008 Consumer Expenditure Diary Survey Data by Bureau of Labor Statistics is used.
- Cigarette prices are from Orzechowski&Walker. For alcohol , we construct Lewbel price indices.
- After dropping observations with missing or recoded state variables, approx. 1200-1400 households remained in each quarter.

Table 1. Smoking bans (at restaurants) over 2002- 2008 period

year	#	states
2002	2	UT, DE
2003	4	UT, DE, NY, FL
2004	7	UT, DE, NY, FL, ME, ID, MA
2005	10	UT, DE, NY, FL, ME, ID, MA, RI, MT, WA
2006	15	UT, DE, NY, FL, ME, ID, MA, RI, MT, WA, NJ, CO, HI, OH, NV
2007	21	UT, DE, NY, FL, ME, ID, MA, RI, MT, WA, NJ, CO, HI, OH, NV, DC, LA, OR, TN, NH, MN
2008	25	UT, DE, NY, FL, ME, ID, MA, RI, MT, WA, NJ, CO, HI, OH, NV, DC, LA, OR, TN, NH, MN, IL, MD, IA, PA

METHOD

- If cigarettes and alcohol are complements, smoking bans at restaurants might decrease restaurant alcohol consumption but increase home alcohol consumption .
- Thus, we consider restaurant and home alcohol consumption as two separate goods with separate habit stocks.
- When utility function is quadratic, rational addiction theory implies following demand functions (see Bask and Melkersson 2004):

$$AR_{it} = \alpha_{1i} + \beta_{10} + \beta_{11}AR_{it-1} + \beta_{12}AR_{it+1} + \beta_{13}AH_{it-1} + \beta_{14}AH_{it} + \beta_{15}AH_{it+1} + \beta_{16}C_{it-1} + \beta_{17}C_{it} + \beta_{18}C_{it+1} + \beta_{19}P_{ARt} + \gamma_{10}D_t + \gamma_{11}X_i + u_{1it}$$

$$AH_{it} = \alpha_{2i} + \beta_{20} + \beta_{21}AH_{it-1} + \beta_{22}AH_{it+1} + \beta_{23}AR_{it-1} + \beta_{24}AR_{it} + \beta_{25}AR_{it+1} + \beta_{26}C_{it-1} + \beta_{27}C_{it} + \beta_{28}C_{it+1} + \beta_{29}P_{AHt} + \gamma_{20}D_t + \gamma_{22}X_i + u_{2it}$$

$$C_{it} = \alpha_{2i} + \beta_{20} + \beta_{21}C_{it-1} + \beta_{22}C_{it+1} + \beta_{23}AR_{it-1} + \beta_{24}AR_{it} + \beta_{25}AR_{it+1} + \beta_{26}AH_{it-1} + \beta_{27}AH_{it} + \beta_{28}AH_{it+1} + \beta_{29}P_{Ct} + \gamma_{30}D_t + \gamma_{33}X_i + u_{3it}$$

where AR_{it} is restaurant alcohol consumption
AH_{it} is home alcohol consumption
C_{it} is cigarette consumption
D_t is a binary variable showing if the state household resides banned smoking at restaurants

- Rational addiction implies $\beta_{i1} > 0$ and $\beta_{i2} > 0$. A positive (negative) coefficient on the current consumption of another good suggests complementarity (substitutability).
- We allocate households into cohorts based on geographic region and gender.
- All cohort variables are weighted by the square root of the number of households in each cohort. Then fixed effects estimators are calculated (see McKenzie, 2004).

RESULTS

Table 2.

Alcohol at Rest		Alcohol at Home		Cigarette	
Constnt	41.732	Constnt	60.577	Constnt	-89.025
	(0.364)		(0.226)		(<.001)
AR_{t-1}	0.123	AH_{t-1}	-0.009	C_{t-1}	0.112
	(0.077)		(0.907)		(0.107)
AR_{t+1}	0.128	AH_{t+1}	-0.105	C_{t+1}	0.074
	(0.060)		(0.136)		(0.288)
AH_{t-1}	-0.074	AR_{t-1}	0.026	AR_{t-1}	-0.008
	(0.259)		(0.739)		(0.844)
AH_t	0.064	AR_t	0.073	AR_t	-0.011
	(0.327)		(0.362)		(0.780)
AH_{t+1}	0.014	AR_{t+1}	-0.123	AR_{t+1}	0.045
	(0.822)		(0.101)		(0.236)
C_{t-1}	0.063	C_{t-1}	-0.105	AH_{t-1}	0.047
	(0.611)		(0.435)		(0.195)
C_t	-0.056	C_t	0.243	AH_t	0.051
	(0.677)		(0.100)		(0.158)
C_{t+1}	-0.008	C_{t+1}	0.082	AH_{t+1}	-0.014
	(0.951)		(0.545)		(0.699)
P_{ARt}	-27.346	P_{AHt}	-40.005	P_{Ct}	-3.047
	(0.011)		(<.001)		(0.377)
ban	-1.957	ban	-2.268	ban	-1.020
	(0.241)		(0.218)		(0.269)
rincome	0.136	rincome	0.018	rincome	0.012
	(<.001)		(0.618)		(0.541)
fam.size	-5.888	fam.size	5.373	fam.size	3.511
	(0.123)		(0.203)		(0.091)
perslt18	10.129	perslt18	0.304	perslt18	-4.913
	(0.036)		(0.955)		(0.067)
age.ref	0.578	age.ref	0.395	age.ref	0.060
	(0.003)		(0.063)		(0.574)
white	9.323	white	30.765	white	2.582
	(0.211)		(<0.001)		(0.506)
married	-8.009	married	-19.737	married	0.035
	(0.411)		(0.066)		(0.995)
widowd	-15.567	widowd	-17.513	widowd	8.347
	(0.261)		(0.249)		(0.275)
divorced	-7.417	divorced	-10.770	divorced	3.216
	(0.475)		(0.345)		(0.578)
seperatd	-16.361	seperatd	-34.641	seperatd	7.524
	(0.441)		(0.137)		(0.522)
college	2.372	college	-2.302	college	0.864
	(0.709)		(0.741)		(0.808)
R^2	0.579	R^2	0.569	R^2	0.676

RESULTS (cont.)

Table 3.

	seperate		system	
$\varepsilon_{AR,AR}$	-3.357	(0.012)	-6.684	(<.001)
$\varepsilon_{AH,AH}$	-2.523	(0.001)	-4.981	(<.001)
$\varepsilon_{C,C}$	-0.538	(0.362)	-0.747	(0.226)
$\varepsilon_{AR,AH}$	-0.018	(0.973)	3.595	(0.069)
$\varepsilon_{AR,C}$	-0.001	(0.999)	1.293	(0.163)
$\varepsilon_{AH,AR}$	0.039	(0.879)	3.866	(0.001)
$\varepsilon_{AH,C}$	-0.063	(0.507)	-0.290	(0.588)
$\varepsilon_{C,AR}$	-0.127	(0.674)	-0.927	(0.484)
$\varepsilon_{C,AH}$	-0.441	(0.231)	1.061	(0.419)
$\varepsilon_{AR,Y}$	0.970	(<.001)	0.849	(<.001)
$\varepsilon_{AH,Y}$	0.067	(0.559)	0.277	(0.029)
$\varepsilon_{C,Y}$	0.146	(0.290)	0.094	(0.518)

DISCUSSION

- In the home alcohol demand equation, current cigarette consumption has a positive and significant coefficient which suggests complementarity relationship.
- Smoking ban at restaurants dummy has a negative coefficient in all three equations, it is not significantly different from zero.
- The results can be explained with the following scenerio:

  - If cigarette and alcohol are complements, smoking bans at restaurants might cause a decrease in the restaurant alcohol consumption of smokers, but might increase restaurant alcohol consumption of nonsmokers.

  -If this is the case, the net effect of smoking bans on overall restaurant alcohol consumption will be zero.

These results are just preliminery, and further analyses are required.