Do Consumers Exploit Commitment Opportunities? Evidence from Natural Experiments Involving Liquor Consumption

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APPENDIX

A. Discussion of controls for interstate liquor flows

To illustrate the calculation of OnInflows and OffInflows, suppose state A, with a population of 100, is bordered by states B, C, D, and E. Suppose also that 10 state B residents, 6 state C residents, 12 state D residents, and 4 state E residents live in counties bordering state A. Finally suppose that Sunday liquor sales are allowed for 11 hours in state A, 7 hours in state B, 5 hours in state C, 12 hours in state D, and 14 hours in state E. We begin by calculating the number of potential person-hours of customer inflows (alcohol outflows) for each neighboring state. For state B, it is $10 \times (11 - 7) = 40$ person-hours. For state C, it is $6 \times (11 - 5) = 36$ person-hours. For states D and E, it is 0 person-hours (because their Sunday hours are longer). Thus, there are 76 potential person-hours of customer inflows in total. Finally, because our regression accounts for per capita alcohol sales in state A, we divide by state A's population. Thus, the value of the customer inflow variable in this example is 0.76.

To illustrate the calculation of OnOutflows and OffOutflows, let's continue with the same numerical example. Suppose in addition that 3 residents of state A live in counties bordering state B, 15 live in counties bordering state C, 17 live in counties bordering state D, and 8 live in counties bordering state E. We begin by calculating the number of potential person-hours of customer outflows (alcohol inflows) for

each neighboring state. For states B and C, it is 0 person-hours (because their Sunday hours are shorter). For state D, it is $17 \times (12 - 11) = 17$ person-hours. For state E, it is $8 \times (14 - 11) = 24$ person-hours. Thus, there are 41 potential person-hours of customer outflows in total. Finally, because our regression accounts for per capita alcohol sales in state A, we divide by state A's population. Thus, the value of the customer outflow variable in this example is 0.41.

The definitions of our inflow and outflow variables ensure that they have sensible properties. If we split each neighboring states into two identical copies (each half as big), or if we doubled the population of a state and all of its neighbors, neither the inflow or outflow measures would change. If we doubled the subject state's population without doubling its neighbors' populations, the customer outflow variables would remain unchanged, but the customer inflow variables would fall by 50 percent. This is the correct answer because the same fraction of the subject state's population would remain susceptible to purchasing alcohol in neighboring states, while potential inflow customers would be half as numerous relative to the subject state's population.

B. Complete regression results

In Tables A1, A2, and A3, we present full regression results for all of the specifications in Tables 3, 4, and 5 of the main text. Coefficients are reported from OLS models with the log of per-capita liquor sales as the dependent variable; specifications include state and year fixed effects, which are not shown. Standard errors clustered at the state level are in parentheses; those significant at the 10 percent level are marked with *, while those significant at the 5 percent level are marked with **.

TABLE A1: MAIN RESULTS (FULL RESULTS)

	(1)	(2)	(3)	(4)
SundayOnHours	0.0094**	0.0116**	0.0093**	0.0099**
	(0.0029)	(0.0035)	(0.0029)	(0.0033)
SundayOffHours	0.0008	0.0012	-0.0051	-0.0000
	(0.0024)	(0.0025)	(0.0049)	(0.0027)
SundayOnHours x SundayOffHours			0.0004	
			(0.0003)	
NonSundayAverageOnHours				-0.0013
				(0.0059)
NonSundayAverageOffHours				-0.0118
				(0.0071)
Liquor Tax	-0.0321**		-0.0508**	
(log of real dollars per gallon)	(0.0152)		(0.0229)	
Cigarette Tax	-0.0278**		-0.0281**	
(log of real dollars per pack)	(0.0125)		(0.0122)	
LegalAge18	0.0700	0.0482	0.0754	0.0482
	(0.0743)	(0.0397)	(0.0717)	(0.0831)
LegalAge19	-0.0346*	-0.0057	-0.0290	-0.0274
	(0.0204)	(0.0235)	(0.0210)	(0.0210)
LegalAge20	-0.0185	-0.0381*	-0.0152	-0.0325
	(0.0219)	(0.0226)	(0.0225)	(0.0250)
Expand	0.0120	0.0483**	0.0083	0.0146
	(0.0203)	(0.0218)	(0.0198)	(0.0192)
Restrict	-0.0458*	-0.0640**	-0.0393	-0.0311
	(0.0231)	(0.0232)	(0.0242)	(0.0202)
Unemployment Rate	-0.0186**	-0.0126**	-0.0187**	-0.0251**
	(0.0040)	(0.0040)	(0.0040)	(0.0046)
Population over 18	-0.0000**	-0.0000	-0.0000**	-0.0000**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Potential Inflows Due to Longer	-0.0024	0.0024	-0.0031*	-0.0008
Home-State On-Premises Hours	(0.0017)	(0.0029)	(0.0017)	(0.0018)
Potential Inflows Due to Longer	0.0046**	0.0010	0.0054**	0.0021
Home-State Off-Premises Hours	(0.0016)	(0.0025)	(0.0018)	(0.0015)
Potential Outflows Due to Shorter	0.0121**	0.0235**	0.0120**	0.0188**
Home-State On-Premises Hours	(0.0058)	(0.0089)	(0.0058)	(0.0073)
Potential Outflows Due to Shorter	-0.0020	-0.0026	-0.0021	-0.0028
Home-State Off-Premises Hours	(0.0075)	(0.0095)	(0.0074)	(0.0085)
Observations	1196	1722	1196	1073

TABLE A2: TESTS OF THE IDENTIFYING ASSUMPTIONS (FULL RESULTS)

	(1)	(2)	(3)	(4)
SundayOnHours	0.0077**	0.0071**	0.0066**	0.0087**
	(0.0025)	(0.0023)	(0.0027)	(0.0029)
SundayOffHours	0.0003	0.0008	-0.0004	-0.0000
	(0.0026)	(0.0025)	(0.0024)	(0.0026)
SundayOnHours - Lead	0.0014	-0.0010		
	(0.0017)	(0.0025)		
SundayOffHours - Lead	0.0009	-0.0010		
	(0.0019)	(0.0021)		
SundayOnHours - Two Leads		0.0030		
		(0.0031)		
SundayOffHours - Two Leads		0.0019		
		(0.0026)		
SundayOnHours - Lag			-0.0003	
			(0.0009)	
SundayOffHours - Lag			-0.0004	
			(0.0011)	
SundayOnHours - Two Lags			0.0018	
			(0.0021)	
SundayOffHours - Two Lags			0.0020	
			(0.0018)	
EverOnChange x Trend				0.0011
				(0.0020)
EverOffChange x Trend				0.0011
				(0.0021)
Liquor Tax	-0.0296*	-0.0265*	-0.0332**	-0.0353**
(log of real dollars per gallon)	(0.0149)	(0.0149)	(0.0150)	(0.0159)
Cigarette Tax	-0.0312**	-0.0344**	-0.0270**	-0.0313**
(log of real dollars per pack)	(0.0131)	(0.0144)	(0.0125)	(0.0120)
LegalAge18	0.0667	0.0624	0.0813	0.0755
	(0.0719)	(0.0687)	(0.0981)	(0.0742)
LegalAge19	-0.0329	-0.0311	-0.0264	-0.0325
	(0.0202)	(0.0200)	(0.0234)	(0.0216)
LegalAge20	-0.0193	-0.0178	-0.0008	-0.0151
	(0.0215)	(0.0208)	(0.0212)	(0.0229)
Expand	0.0143	0.0190	0.0154	0.0134
	(0.0208)	(0.0221)	(0.0206)	(0.0199)
Restrict	-0.0431*	-0.0434*	-0.0513**	-0.0462*
	(0.0233)	(0.0245)	(0.0237)	(0.0231)
Unemployment Rate	-0.0190**	-0.0196**	-0.0186**	-0.0187**
	(0.0041)	(0.0041)	(0.0047)	(0.0040)
Population over 18	-0.0000**	-0.0000**	-0.0000**	-0.0000**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Potential Inflows Due to Longer	-0.0019	-0.0007	-0.0027	-0.0024
Home-State On-Premises Hours	(0.0017)	(0.0017)	(0.0018)	(0.0021)
Potential Inflows Due to Longer	0.0039**	0.0030*	0.0049**	0.0051**
Home-State Off-Premises Hours	(0.0016)	(0.0017)	(0.0017)	(0.0020)
Potential Outflows Due to Shorter	0.0116*	0.0109*	0.0081	0.0116*
Home-State On-Premises Hours	(0.0059)	(0.0061)	(0.0056)	(0.0058)
Potential Outflows Due to Shorter	-0.0002	0.0019	-0.0022	-0.0016
Home-State Off-Premises Hours	(0.0073)	(0.0069)	(0.0070)	(0.0077)
Observations	1149	1102	1104	1196

TABLE A3: ADDITIONAL ROBUSTNESS CHECKS (FULL RESULTS)

	(1)	(2)	(3)	(4)
SundayOnHours	0.0095**	0.0095**	0.0089**	
	(0.0028)	(0.0028)	(0.0028)	
SundayOffHours	0.0008	0.0008	0.0003	
	(0.0024)	(0.0023)	(0.0024)	
AllowsSundayOn				0.0805**
				(0.0366)
AllowsSundayOff				0.0367
				(0.0297)
Ban on Smoking in Bars	0.0038			
	(0.0259)			
Liquor Tax	-0.0321**	-0.0362**	-0.0213	0.0043
(log of real dollars per gallon)	(0.0152)	(0.0158)	(0.0151)	(0.0164)
Wine Tax		0.0032		
(log of real dollars per gallon)		(0.0200)		
Beer Tax		0.0595		
(log of real dollars per gallon)		(0.0738)		
Cigarette Tax	-0.0281**	-0.0314**	-0.0093	-0.0310**
(log of real dollars per pack)	(0.0126)	(0.0125)	(0.0126)	(0.0130)
Log of Per Capita Beer Consumption			0.3244**	
(Ethanol Equivalent)			(0.0890)	
Log of Per Capita Wine Consumption			0.1040**	
(Ethanol Equivalent)			(0.0397)	
LegalAge18	0.0698	0.0693	0.0456	0.0677
	(0.0742)	(0.0723)	(0.0789)	(0.0777)
LegalAge19	-0.0347*	-0.0359*	-0.0252	-0.0398*
	(0.0203)	(0.0207)	(0.0221)	(0.0214)
LegalAge20	-0.0183	-0.0182	-0.0291	-0.0193
	(0.0219)	(0.0215)	(0.0217)	(0.0222)
Expand	0.0121	0.0149	0.0094	0.0153
	(0.0203)	(0.0212)	(0.0207)	(0.0216)
Restrict	-0.0467*	-0.0481**	-0.0469**	-0.0366*
	(0.0247)	(0.0233)	(0.0227)	(0.0201)
Unemployment Rate	-0.0186**	-0.0192**	-0.0154**	-0.0178**
	(0.0040)	(0.0041)	(0.0036)	(0.0040)
Population over 18	-0.0000**	-0.0000**	-0.0000**	-0.0000**
	(0.0000)	(0.0000)	(0.0000)	(0.0000)
Potential Inflows Due to Longer	-0.0024	-0.0023	-0.0029	-0.0003
Home-State On-Premises Hours	(0.0018)	(0.0017)	(0.0019)	(0.0022)
Potential Inflows Due to Longer	0.0045**	0.0044**	0.0059**	0.0025
Home-State Off-Premises Hours	(0.0016)	(0.0016)	(0.0019)	(0.0020)
Potential Outflows Due to Shorter	0.0123**	0.0122**	0.0099*	0.0093*
Home-State On-Premises Hours	(0.0056)	(0.0059)	(0.0051)	(0.0055)
Potential Outflows Due to Shorter	-0.0021	-0.0024	-0.0021	0.0002
Home-State Off-Premises Hours	(0.0074)	(0.0074)	(0.0067)	(0.0081)
Observations	1196	1196	1196	1196