

Online Appendix for "Wintertime for Deceptive Advertising?", by Jonathan Zinman and Eric Zitzewitz

Online Appendix Table A1. Tests for selection biases in resort snow reports

Dependent variable: = 1 if observation is archived and/or resort issued snow report

	Was state*day page archived?			Did resort issue a fresh report? (conditional on page being archived)			Is report in dataset? (page archived & resort issued report)		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Weekend (Sat or Sun)	-0.0099 (0.0320)	-0.0180 (0.0327)	-0.0389 (0.0663)	0.0068 (0.0091)	0.0044 (0.0104)	0.0116 (0.0421)	-0.0020 (0.0285)	-0.0106 (0.0289)	-0.0132 (0.0532)
Gov snow (NOHRSC/NOAA)		0.0079* (0.0042)	-0.0048 (0.0108)		0.0040*** (0.0016)	-0.0095 (0.0070)		0.0066* (0.0037)	-0.0052 (0.0088)
Gov snow*Weekend		0.0095 (0.0074)	0.0063 (0.0195)		0.0032 (0.0031)	0.0163 (0.0129)		0.0101 (0.0062)	0.0116 (0.0150)
Fixed effects									
Week (Wed-Tues)?			yes			yes			yes
State or resort?			state			resort			resort
Observations	20,603	19,886	19,841	59,737	57,488	54,105	154,556	152,307	149,515
Dependent variable mean		0.42			0.86			0.37	

The table reports marginal effects from probit regressions predicting whether a state's page was archived on a given day, and whether a resort snow report is available for a specific day (conditional on the page being archived and unconditional). The sample includes every day in the 2004-2008 seasons (October 1 to May 31) for every resort between the resort's opening and closing date (as determined by the first and last day a resort snow report is issued). Since the variation in the regressions in the first three columns is at the state*day level, they include one data point for each state*day, but observations are weighted by the number of resorts in the state. Actual snow is measured using the average snowfall reported by the NOAA stations matched to the state's resorts. Standard errors adjust for clustering within day. Significance at the 10, 5, and 1 percent levels is indicated by 1, 2, and 3, asterisks, respectively.

Online Appendix Table A2. Weekend effect estimates for subsamples

Dependent variable: Inches of new natural snowfall reported by resort

	No weather controls			Controlling for NOAA/NOHRSC			Controlling for weighted SNODAS		
	Obs.	Coef.	SE	Obs.	Coef.	SE	Obs.	Coef.	SE
All observations	56,402	0.233**	(0.097)	47,741	0.149**	(0.059)	39,920	0.174*	(0.097)
2004-5 Season	4,054	0.152	(0.410)	2,218	0.310	(0.375)	2,829	0.208	(0.340)
2005-6 Season	4,807	0.571	(0.367)	3,463	0.407	(0.305)	3,714	0.276	(0.313)
2006-7 Season	15,376	0.248	(0.184)	13,518	0.040	(0.102)	11,354	0.243**	(0.123)
2007-8 Season	32,165	0.197	(0.129)	28,542	0.139*	(0.074)	22,023	0.138	(0.145)
November	2,581	0.591	(0.357)	1,811	0.451	(0.324)	2,051	0.231	(0.342)
December	10,271	-0.029	(0.194)	8,720	0.082	(0.139)	7,140	0.080	(0.161)
January	12,247	0.521*	(0.290)	10,611	0.372**	(0.158)	8,495	0.516	(0.326)
February	11,932	0.088	(0.201)	10,304	0.124	(0.141)	9,137	-0.052	(0.226)
March	14,653	0.326*	(0.188)	12,623	0.147	(0.110)	9,704	0.215	(0.150)
April and May	4,718	-0.054	(0.207)	3,672	-0.140	(0.139)	3,393	0.029	(0.171)
Christmas holiday	3,683	-0.056	(0.277)	3,157	-0.086	(0.206)	1,746	-0.415*	(0.231)
President's day week	2,395	0.509	(0.301)	2,119	0.307	(0.191)	1,841	-0.139	(0.319)
Other periods	50,324	0.240**	(0.106)	42,465	0.139**	(0.063)	36,333	0.193*	(0.104)
West	28,880	0.359**	(0.171)	21,686	0.264**	(0.113)	21,112	0.379**	(0.153)
East	27,522	0.092	(0.126)	26,055	0.066	(0.072)	18,808	0.023	(0.114)
U.S.	49,215	0.219**	(0.106)	44,318	0.158***	(0.060)			
Canada	7,187	0.315**	(0.130)	3,423	0.122	(0.181)			

This table repeats the specifications in Table 2 (columns 1 and 4) and Table A4 (column 3) for subsamples of the data. Significance at the 10, 5, and 1 percent level is indicated with 1, 2, and 3 asterisks.

Online Appendix Table A3. Robustness of standard errors to alternative assumptions about clustering

	(1)	(2)	(3)	Approach in paper ↓ (4)	(5)	(6)	(7)	(8)	(9)
Dependent variable: Resort snow, no controls, SNODAS sample (Table 2, Col 2)	0.242*** (0.041)	0.242*** (0.050)	0.242** (0.113)	0.242** (0.117)	0.242*** (0.087)	0.242** (0.112)	0.242** (0.105)	0.242** (0.117)	0.242** (0.099)
Dependent variable: Resort snow, controlling for weighted SNODAS (Table 2, Col 4)	0.175*** (0.036)	0.175*** (0.044)	0.175** (0.087)	0.175* (0.091)	0.175*** (0.064)	0.175* (0.092)	0.175** (0.077)	0.175** (0.084)	0.175** (0.079)
Dependent variable: Resort snow, no controls, NOAA/NOHRSC sample (Table A4, Col 2)	0.187*** (0.035)	0.187*** (0.038)	0.187* (0.097)	0.187* (0.099)	0.187** (0.075)	0.187** (0.081)	0.187** (0.093)	0.187* (0.106)	0.187** (0.085)
Dependent variable: Resort snow, controlling for NOAA/NOHRSC-reported snow (Table A4, Col 3)	0.149*** (0.031)	0.149*** (0.034)	0.149** (0.059)	0.149** (0.061)	0.149*** (0.043)	0.149** (0.061)	0.149** (0.063)	0.149*** (0.052)	0.149** (0.060)
Clustering scheme									
X-section		Resort		Resort	Resort	State			Spatial HAC
Time			Day	Day	Month	Month			Spatial HAC
X-section*Time							State*Month	Census div*Month	

This table presents versions of the specifications in Table 2 and Table A4. Regressions in the first two rows have 39,920 observations and those in the second two rows have 47,741 observations. All standard errors allow for heteroskedasticity. Columns 2-8 allow for one or two-dimensional clustering as described. The "Spatial HAC" standard errors in column 9 allow for geographically and serially correlated errors, using the method described in Conley (2008) and code provided by Hsiang (2010) (available at <http://www.fight-entropy.com/2010/06/standard-error-adjustment-ols-for.html>). Our spatial HAC standard errors allow for 7 daily lags of serial correlation, a 300 kilometer limit for spatial correlations, and a Bartlett linear kernel (results are very insensitive to these choices). Significance at the 10, 5, and 1 percent levels is indicated by 1, 2, and 3, asterisks, respectively.

Online Appendix Table A4. Weekend effect regressions, with and without controlling for actual snowfall, using weather stations instead of SNODAS (Compare to Table 2)

Dependent variable: Inches of new natural snowfall reported by resort

Observations include	All obs	w/NOAA-NOHRSC		
	(1)	(2)	(3)	(4)
Weekend (Sat&Sun)	0.233** (0.099)	0.187* (0.099)	0.149** (0.061)	0.109* (0.058)
NOAA-NOHRSC (t+1)				0.054** (0.024)
NOAA-NOHRSC (t)			0.685*** (0.047)	0.674*** (0.048)
NOAA-NOHRSC (t-1)				0.180*** (0.025)
Observations	56,402	47,741	47,741	43,119
Unique days	752	709	709	692
R ²	0.130	0.131	0.316	0.343

OLS with fixed effects for weeks (Wed-Tues) and resort. Columns 2-3 and 4 are restricted to observations with weather station data for day t and days t-1 to t+1, respectively. Standard errors allow for clustering within both day and resort. Significance at the 10, 5, and 1 percent level is indicated with 1, 2, and 3 asterisks, respectively.

Online Appendix Table A5. Extensive v. Intensive Margins, using Weather Stations Instead of SNODAS (compare to Table 3)

	Dependent variable: Sample:	= 1 if resort reported snow >0 Full (1)	Resort-reported snow (inches) Full (2)	Resort-reported snow (inches) Resort snow > 0 (3)
Indicator variables for levels of government (NOAA-NOHRSC)-reported snow				
Gov = 0.01 to 0.49"		0.162*** (0.012)	0.510*** (0.065)	0.255 (0.187)
Gov = 0.50 to 0.99"		0.308*** (0.016)	1.161*** (0.096)	0.724*** (0.197)
Gov = 1.00 to 5.99"		0.461*** (0.015)	2.566*** (0.143)	2.219*** (0.197)
Gov = 6.00+		0.625*** (0.023)	6.203*** (0.416)	5.691*** (0.393)
Interactions of indicator variables with weekend effect				
Weekend*(Gov = 0)		0.016* (0.009)	0.125** (0.057)	0.589** (0.264)
Weekend*(Gov = 0.01 to 0.49")		0.065*** (0.018)	0.265*** (0.099)	0.073 (0.252)
Weekend*(Gov = 0.50 to 0.99")		0.028 (0.023)	0.109 (0.151)	0.114 (0.236)
Weekend*(Gov = 1.00 to 5.99")		0.016 (0.017)	-0.043 (0.164)	-0.249 (0.196)
Weekend*(Gov = 6.00+)		-0.025 (0.038)	0.867 (0.882)	1.236* (0.693)
Observations		47,741	47,741	14,039

This table reports the results of regressions that are identical to Table 2, column 2, except that the single weekend indicator is replaced by interactions of that variable with indicator variables for different levels of weighted SNODAS snowfall. The regressions also include the uninteracted SNODAS indicator variables, but we suppress these for concision. Significance at the 10, 5, and 1 percent levels is indicated by 1, 2, and 3, asterisks, respectively.

Online Appendix Table A6. Variation in weekend effect by resort characteristics, controlling for weather station snow instead of SNODAS (compare to Table 4)

Dependent variable: Resort-reported snow

	(1)	(2)	(3)	(4)
Weekend (Sat&Sun)	0.149** (0.061)	0.013 (0.059)	-0.201 (0.145)	-0.199 (0.144)
Interaction effects with weekend				
Expert terrain > 0		0.137** (0.066)	0.148** (0.065)	0.147** (0.065)
No money back guarantee		0.166** (0.074)	0.172*** (0.066)	0.173*** (0.066)
Ln(Population within 150 miles), normalized			0.060 (0.072)	0.059 (0.072)
1/(1+number of competitors within 50 miles)			0.428 (0.367)	0.441 (0.371)
West			0.211 (0.228)	0.210 (0.231)
Publicly traded owner				-0.009 (0.145)
Government owner				-0.071 (0.096)
Observations	47,741	47,741	47,741	47,741
Unique days	692	692	692	692
R ²	0.316	0.316	0.316	0.316

OLS regressions with a control for NOAA/NOHRSC weather station-reported snow and fixed effects for weeks (Wed-Tues) and resort. We consider resorts competitors if they are within 50 miles, are not under common ownership, and either both or neither have expert terrain. Standard errors allow for clustering within both day and resort. Significance at the 10, 5, and 1 percent levels is indicated by 1, 2, and 3, asterisks, respectively.

Online Appendix Table 7. Average resort-reported and government-reported snowfall by weekday/weekend and resort characteristic, using weather station snow instead of SNODAS (compare to Table 5)

	Weekday snow	Weekend snow	Weekend/Weekday ratio
Expert terrain resorts			
Resort reports	1.45	1.72	1.19
NOAA/NOHRSC weather stations	1.07	1.12	1.05
Resort/Weather station	1.36	1.54	1.14
N resort-days	16,289	6,479	
No expert terrain resorts			
Resort reports	1.18	1.38	1.17
NOAA/NOHRSC weather stations	1.04	1.19	1.14
Resort/Weather station	1.13	1.16	1.02
N resort-days	17,776	7,197	
No-guarantee resorts			
Resort reports	1.40	1.71	1.22
NOAA/NOHRSC weather stations	1.13	1.19	1.05
Resort/Weather station	1.24	1.44	1.16
N resort-days	14,563	5,738	
Money-back guarantee resorts			
Resort reports	1.24	1.42	1.14
NOAA/NOHRSC weather stations	1.00	1.13	1.13
Resort/Weather station	1.24	1.25	1.01
N resort-days	19,502	7,938	

The figures in bold are the ratio of the ratios (i.e. the ratio of the resort-to-weather station ratio on weekends to that on weekdays).

Online Appendix Table A8. First-hand reporting (via iPhones) and the weekend effect

Dependent variable: Resort - NOHRSC/NOAA snow

	(1)	(2)	(3)	(4)	(5)	(6)
Weekend (Sat&Sun)	0.042 (0.076)					
Interaction effects with weekend						
Post-Jan8 (1/8 or later in any season)		0.076 (0.185)		0.069 (0.177)		
Post-launch (1/8/2009 or later)	0.209* (0.119)	0.253* (0.139)		0.215 (0.139)		
iPhone coverage at resort	0.118* (0.069)					
iPhone coverage*post-Jan8		-0.174 (0.163)	-0.159 (0.159)	-0.091 (0.156)	0.037 (0.075)	-0.095 (0.108)
iPhone coverage*post-launch	-0.239** (0.097)	-0.214** (0.108)	-0.216** (0.106)	-0.204* (0.112)	-0.172* (0.098)	-0.193** (0.080)
Main effects						
iPhone coverage*post-Jan8		0.111 (0.078)	0.110 (0.078)			
iPhone coverage*post-launch	0.187*** (0.067)	0.186*** (0.065)	0.188*** (0.065)			
Fixed effects						
Resort	X					
Week	X					
Month		X				
Resort*Weekend		X	X	X		X
Month*Weekend			X		X	X
Resort*Month				X	X	X
Observations	72,569	72,569	72,569	72,569	72,569	72,569
Unique days	813	813	813	813	813	813
R ²	0.091	0.086	0.088	0.220	0.217	0.223

Here we add the 2008-2009 ski season to the sample. As in earlier tables, weeks run from Wednesday to Tuesday. To keep month and week fixed effects synchronized with the post-launch and post-Jan 8 variables, Post-Jan 8/Launch refers to weeks (Wed-Tues) beginning after January 7, and months by the number of days needed to make January entirely post-Jan 8/launch. The main effects for post-Jan 8 and post-launch are therefore absorbed by either week or month fixed effects and the interactions of these effects and the weekend effect are absorbed by month*weekend effects. Likewise, the main effect for iPhone coverage at resort is absorbed by the resort fixed effect, and resort*month fixed effects absorb interactions of iPhone coverage and post-Jan8/Launch. Standard errors allow for clustering within both day and resort. Significance at the 10, 5, and 1 percent levels is indicated by 1, 2, and 3, asterisks, respectively.

Coverage maps from AT&T (the sole network provider for the iPhone in the United States during our sample period) do not account well for topography, so we classify a resort as covered (and hence more-affected) if it was the subject of 10 or more first-hand reports after January 8, 2009 that did *not* mention snow quality.