Does Snowfall Influence Ski Visitation to Resorts in Colorado? An Empirical Analysis Uncovering the Relationship

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Abstract

The skiing industry is perceived as heavily influenced by weather conditions and snowfall totals. This analysis serves as an empirical work highlighting the lack of correlation between ski visits and snowfall to 15 resorts in Colorado from 1995-2004. Lowess curve graphs, ordinary least squares, fixed effects, quantile snowfall tests, and snowfall thresholds were the econometric methods used that yielded no convincing evidence. Rather, a strong relationship is drawn between ski visits and other variables such as number of trails, snowmaking capabilities, acreage of resort and income by county. This paper strives to apply meaning to such results.

Keywords: snowfall, ski visits, ski visit elasticity, fixed effects, resort variables, snowfall threshold

Introduction

The Colorado ski industry is the largest of any state in the United States, responsible for $4.8 billion in economic value and supportive of 46,000 jobs in 2015 (Blevins, 2016). With more than 25 ski resorts to explore and increased affordability of multi-mountain season passes such as the Epic Pass and Rocky Mountain Super Pass, Colorado leads the United States in annual ski visits year after year. The industry is strong and lucrative but is there reason to believe this success will deteriorate? Climate change is a looming question mark and poses extreme threats to the industry. It is well documented that climate change alters snow patterns in dramatic manners, leaving some ski seasons mildly dry and others severely wet (Yang, Wan 2010). Given out of state skiers represent 55-60% of total visits to resorts in Colorado, it is plausible that with decreased snowfall totals, such a demographic will choose to ski elsewhere. My motivation in writing this thesis was to analyze the correlation between ski visits and snowfall and hypothesize whether the potential decreases in snowfall may have any effect on future visits to resorts. If so, climate change could have catastrophic consequences to one of the most important economic sectors of Colorado.

An athlete on the club ski team at University of Colorado, I spend much of my free time traveling and competing at different ski resorts across the United States during the winter months. Such experiences have allowed me to observe the demographic and preferences that attract specific skiers to specific resorts. It is a common conception in the ski industry that wherever there is more snow, there will be more people skiing but during my travels I did not find this to be necessarily true. Rather, I observed there to be other variables to be more important in determining what resort a skier may go to. Quantifying the other variables became my second motivation in writing this analysis.

Literature Review

In order to construct a rich and differentiated analysis, a robust literature review was conducted. Published econometric papers surveying the correlation between snowfall and ski visits were scarce but nonetheless evident. Two particular papers, "The Demand for Winter Sports: Empirical Evidence for the Largest French Ski Lift Operator" and "Climate Change and Aspen: An Assessment of Impacts and Potential Responses" were found to be the most relatable as each seek to understand the correlation between ski visitation and snowfall. "Climate Change and the Ski Industry in Eastern North America: A Reassessment" was a published economic paper which quantified the importance of snowmaking machines and is also relevant to the thesis.

"The Demand for Winter Sports: Empirical Evidence for the Largest French Ski Lift Operator" is a published econometric paper by economist Martin Falk of the Austrian Institute of Economic Research (Falk, 2015). Falk attempts to uncover the determinants of long run winter tourism exclusively at ski resorts in France. Data is compiled from aggregated ski visits to six resorts apart of the Compagne des Alpes from the years 1993-2011. He mentions previous research has failed to incorporate a measure of income and lift ticket prices compared to competitors, a critical component in determining ski demand (Falk, 2015). With a nuanced approach, Falk's methodology finds merit in using real GDP figures from foreign countries as a substitute for income as it provides an accurate measure of purchasing power. The economist's rationale is where someone skis is greatly attributable to their income and given French ski resorts are frequented by tourists, real GDP accounts for a tourist's purchasing power. Utilizing ordinary least squares and fixed effect regressions in log-linear format: snowfall, temperature, real GDP and relative lift ticket prices serve as the independent variables. Although Falk finds that snowfall is statistically significant, the degree to which it influences skier visitation is small. OLS results show a snowfall coefficient of 0.025 meaning a 1% change in snowfall results in a 0.025% change in ski visits (Falk, 2015). When accounting for fixed effects, a 1% change in snowfall results in a 0.016% change in ski visits (Falk, 2015). Another conclusion Falk makes is that skiing at the sampled resorts is a luxury good, exhibiting characteristics of increased demand as income rises. Falk's research raises value in testing income and other variables associated with luxury goods in the ski industry (fine dining, ski-in ski-out lodging).

"Climate Change and Aspen: An Assessment of Impacts and Potential Responses" is an economic analysis sponsored by the Aspen Global Change Institute which strictly looks at climate change prediction models and the effects to the ski industry in Aspen (Gosnell, Travis, Williams, 2006). Forecasted measures of ski visitation are the main focus but restaurant sales, housing value, summer tourism and job displacement are all analyzed as well. To recapture the report by AGCI, a correlation between skiing and snowfall is drawn using data from 1966-2005 across the four ski resorts in Aspen. Using the Intergovernmental Panel on Climate Change low, medium and high impact emission assumptions, predicted number of skier days and socioeconomic effects varied annually for years up to 2100 (Gosnell et al., 2006). Key findings included: decreases in snowfall yielded small decreases in skier visitation, a heightened reliance on snowmaking machines over the years surveyed, and an expected increase in rain rather than snow up to year 2100 (Gosnell et al., 2006). Given Gosnell's focal point of climate change mitigation, variables such as number of trails, skiable acreage, snowmaking capabilities, and peak elevation were all examined. Such variables will also be tested in this paper.

"Climate Change and the Ski Industry in Eastern North America: A Reassessment" published by economists Daniel Scott and Brain Mills analyzed the effectiveness of snowmaking machines at ski resorts in Vermont, Ontario, Quebec and Michigan (Scott, Mills 2006). The research takes six resorts that recently added snowmaking capabilities and makes predictions to the benefits of the machines. It is forecasted that between 2020-2030 under the highest climate change thresholds generated by the Canadian Climate Impact Scenario, five of the six resorts have reductions of skiable days of less than 25% (Scott, Mills 2006). The economists calculated that resorts without snowmaking capabilities would lose 32-65% of skiable days. (Scott, Mills 2006). This stark contrast stresses the importance in testing snowmaking significance in my analysis.

Data

The data sets and variables chosen in this paper try to understand the correlation between visits and snowfall. Data compiled for this paper takes form in both panel data and cross-sectional data. Both forms have variables which seem plausible in identifying a skier's preferences. Ski visits and snowfall to the fifteen resorts, county income and county population exhibit panel data as they vary both with time and by resort. The other fifteen variables that stay constant with time and only vary by resort are considered cross-sectional data. These variables include: skiable acreage, vertical drop, peak elevation, distance from Denver, distance from closest airport, number of lifts, snowmaking acres, number of trails, mountain lodging (dummy), off-mountain dining/shopping (dummy), nightlife (dummy), night skiing (dummy), season pass usage for different mountains (dummy), and upscale amenities (dummy). Cross-sectional data comes from 2016 levels as data from 1995-2004 could not be found. These variables also theoretically change with time but corresponding data to match changes across all fifteen resorts could not be found. The variables listed with dummy in parenthesis are interaction terms which a ski resort either has or doesn't have. In an econometric sense, a one would be given to a resort that has the dummy and a zero would be given to the resort that doesn't have the dummy.

Data for majority of the listed variables was published by companies that cater information to the ski community; Powder Hounds, On the Snow and Colorado Ski Country are some of the publications used. The data that pertains to demographics was published by different governmental agencies of Colorado. Specifically, per county income was published by the Colorado Department of Labor and per county population data was obtained from the Colorado Department of Local Affairs. Each ski resort will receive income and population levels based on the county the ski resort is located in.

Ski visitation data was the largest obstacle to starting the analysis as majority of the ski resorts keep such information confidential. Numerous unsuccessful attempts were made either through in-person meetings or phone calls to acquire ski visit data directly from the resort. A useful data set was recommended by a University of Colorado graduate who was interested in predicting pollution levels at ski resorts in Colorado (Shelesky, 2016). Published by Colorado Ski Country, ski visits to each of the fifteen Colorado ski resorts sampled from 1995-2004 were recorded (Mills, 2004). These resorts include: Arapahoe Basin, Aspen Mountain, Beaver Creek, Breckenridge, Copper Mountain, Crested Butte, Keystone, Loveland, Monarch, Steamboat, Snowmass, Telluride, Vail, Winter Park and Wolf Creek. The snowfall data was acquired from a publication called Best Snow and has season totals of snowfall for all resorts from 1995-2004

(Crocker, 2017). This paper finds Best Snow's snowfall data to be more pertinent to the analysis than snowfall data from weather collection websites such as the National Organization of Atmospheric Administration based in Boulder, Colorado. For purposes of less measurements across Colorado ski resorts and snowpack as the only statistical measure, NOAA was found to be an inferior indicator for skiing purposes.

Methodology

Lowess curve graphs, ordinary least squares, fixed effects, quantile regression, and snowfall thresholds were the econometric methods found to be most applicable to the analysis. This section highlights the econometric equations used and their interpretations.

i. Lowess Curve Graphs

A lowess curve graph allows a linear regression line to be drawn that tries to best fit the data points. By taking into account the sum of squares, the lowess line equally weighs all data points and plots a constant slope. The lowess curve graph is most effective in nonparametric scenarios because the distribution shape is unknown. In the application of snowfall analysis, this paper finds strong evidence of unknown parameters therefore requiring a nonparametric estimator. The four graphs used include: ski visits and snowfall, natural log of ski visits and natural log of snowfall, ski visits and snowfall for the year 1999 and ski visits and snowfall exclusive to Crested Butte Mountain Resort. The first two show an overall relationship between ski visits and snowfall where the latter two provide the reader with a more in-depth analysis of the nonlinear relationship.

ii. Ordinary Least Squares

In ordinary least squares regression, the unknown parameters are estimated through the minimization of sum of squares; by doing so, OLS finds a linear relationship between the variables. For purposes of this paper, multiple OLS regressions were utilized as OLS is the basis for conducting any econometric analysis. Below are the equations:

$$\ln(V_{it}) = B_0 + B_1\ln(Snfwl_{it}) + B_2\ln(Pop_{ct}) + B_3\ln(Inc_{ct}) + \sum_{j=1}^{15} B_j \ln(X_i) + \varepsilon_{it} \quad (1)$$

$$\ln(V_{it}) = B_0 + B_1\ln(Snfwl_{it}) + B_2\ln(Acre_i) + B_3\ln(Snwmkg_i) + B_3\ln(Trls_i) + \varepsilon_{it} \quad (2)$$

Equation 1 is simply used as a glimpse into how correlated all variables are in relation to ski visits. The equation serves as a stepping stone and highlights where further analysis needs to be dedicated. In the equation, the subscripts i, t, and c highlight variables that vary with time and by county/resort. Σ represents the fifteen control variables listed in the data section of this paper and are believed to also influence skier preferences in choosing ski resorts. Lastly, ε is the error term and accounts for observational error in the regression. Each variable expressed in the equation is in natural log format as resorts vary by visits drastically. Monarch and Vail, for instance, highlight the disparity in size of how many people annually ski at each resort. The former attracts around 300,000 people annually over the sampled timeframe while the latter attracts 1,500,000. To claim a one inch increase in snow would impact ski visits to each resort by the same amount would be false. It is for this reason that natural logs are used as the method accounts for percentage change in skier visits relative to the visitation size of each resort. Equation 2 also uses natural logs and incorporates control variables. Such variables include resort acreage, snowmaking acreage and number of trails and are used to prevent omitted variable bias. For a credible econometric test, variables which strongly correlate to visits need to be included in the regression. Resort acreage, snowmaking acreage and number of trails all exhibit a strong correlation to visits, thus their inclusion. The main objective of equation 2 is to understand how a one percent change in snowfall results in x percent change in ski visits. This is known as the ski visit elasticity with respect to snowfall.

iii. Fixed Effects

Given some of the data varies by resort and time, a more rich and robust econometric test requires fixed effects to be used. This model accounts for differences amongst resorts by holding constant all data that varies by resort or with time. By doing this, all fifteen ski resorts can be equally compared as differences in snowfall, population and income amongst resorts are held constant. Below are the equations:

$$\ln(V_{it}) = B_0 + B_1\ln(Snfwl_{it}) + B_2\ln(Pop_{it}) + B_3\ln(Inc_{it}) + \delta_i + \varepsilon_{it} \quad (3)$$
$$\ln(V_{it}) = B_0 + B_1\ln(Snfwl_{it}) + B_2\ln(Inc_{ct}) + \delta_i + \varepsilon_{it} \quad (4)$$
$$\ln(V_{it}) = B_0 + B_1\ln(Snfwl_{it}) + B_2\ln(Inc_{ct}) + \delta_i + \delta_t + \varepsilon_{it} \quad (5)$$

Equation 3 highlights all variables that exhibit panel data characteristics (snowfall, population and income) and serves as a general sampling of the statistical relationships. Resort fixed effects are accounted for by δ_i and the error term is accounted for by ε_{it}. For reasons mentioned above, natural logs will be used to account for size differences across resorts. Equation 4 offers more detailed insight to the relationship between ski visits and snowfall by only relying on income as a control variable. Income shows a correlation to ski visits in fixed effect analysis so we use the variable to eliminate omitted variable bias. Finally, equation 5 is beneficial to the analysis by accounting for resort fixed effects δ_i and time fixed effects δ_t. Considering each of these effects, every individual year can be tested for statistical significance. This paper understands that there may not be a holistic relationship between visits and snowfall so using a time fixed effect yields more detailed findings.

iv. Quantile Snowfall Test

A quantile snowfall test also seeks to find a deeper understanding of the relationship between ski visits and snowfall. Because the timeframe between 1995-2004 is ten years and there are fifteen resorts sampled, 150 snowfall data points exist. In essence, the 150 snowfall data points are assigned into six different groups based on mean snowfall. These groups are categorized as: severely dry, moderately dry, mildly dry, mildly snowy, moderately snowy and severely snowy. Each of the six groups is then tested to measure if snowfall influences ski visits. In this circumstance, a quantile snowfall test is valuable because it replaces the holistic test of ski visits and snowfall with more specific subcategory tests. In the equation, snowfall varies with time by resort, hence the subscripts *i* and *t*. Snowfall is used as the independent variable and *q* highlights the six different quantiles, one being severely dry and six being severely snowy. ε is the error term and accounts for observational error in the regression; δ_i is the resort fixed effect. Natural log of income is used to omit variable bias.

$$\ln(V_{it}) = B_0 + B_1\ln(Snfwl_{it}) + B_2\ln(Inc_{ct}) + q1_{it} + q2_{it} + q3_{it} + q4_{it} + q5_{it} + q6_{it} + \delta_i + \varepsilon_{it} \qquad (6)$$

v. Snowfall Threshold

A snowfall threshold to test statistical significance serves as a lower bound effect. In application, a snowfall is chosen and all data points less than the minimum threshold are used in the regression. For instance, if a threshold of 220 inches were chosen, 55 of 150 snowfall recordings would be used in the regression as this is how many data points fall below the 220-inch threshold. Snowfall thresholds for below average snowfall (x < 200 in), average snowfall (240 < x < 280 in) and above average snowfall (x > 350 in) are tested individually for significance. A quantile snowfall test highlights a range of snowfall whereas a snowfall threshold tests an exact inch level of snowfall. The equation takes into account resort fixed effects δ_i and is in natural logs to offer a fair comparison across resorts. Income is once again used to omit variable bias.

$$\ln(V_{it}) = B_0 + B_1 \ln(Snfwl_{it}) + B_2 \ln(Inc_{ct}) + \delta_i + \varepsilon_{it} \qquad (7)$$

Results

Strong statistical evidence found no relationship between ski visits and snowfall. To start, flat lowess curve lines would elicit a lack of relationship. P-values in fixed effect regressions were too high to identify any type of correlation and correctly reject the null hypothesis that snowfall does not influence ski visits. More refined statistical models such as quantile tests of snowfall and snowfall thresholds yielded results that substantiate the conclusions made in fixed effects. Below is a thorough investigation of the results organized by econometric method.

i. Lowess Curve Graphs

In Figure 8, the relationship between ski visits and snowfall highlights the flat nature of the lowess slope. In the graph, it is apparent that some of the most visited resorts are during times when there is the least amount of snow. The same can be said when there is above average snow and below average ski visits. These outliers further elude to the lack of a relationship. Figure 9 reveals more insightful data as the variables visits and snowfall are regressed with natural logs, allowing for a fairer comparison across resorts. This graph shows the ski visit elasticity with respect to snowfall and similar to Figure 8, a flat lowess line shows no relationship. If there was any statistical relationship we would expect an increase in natural log of visits to be matched by an increase in natural log of snowfall. Such a relationship would be shown through a positive and increasing lowess line. This, however, is lacking. Figure 10 and figure 11 are graphs which plot ski visits and snowfall for the year 1999 and ski visits and snowfall to Crested Butte across 1995-

2004, respectively. Neither show any relationship as data points appear to be nonlinear and show no correlation.

ii. Ordinary Least Squares

Figure 12 displays the statistical results of all nineteen variables in equation 1's regression. Snowfall in particular is of interest as a p-value of 0.100 and coefficient of –0.069 is recorded. In econometrics, p-values of 0.1 would be the minimum to portray statistical significance with 0.05 being ideal. In this scenario, the p-value implies we can reject the null hypothesis that snowfall has no effect on ski visits with 90% confidence. The natural log coefficient implies a 1 percent change in snowfall results in a -0.069 percent decrease in visits. Despite the reporting of statistical significance at a credible level, I find less merit in the test because of the high number of control variables. With more variables used in the regression, less observations per variable are used, manipulating the results. Ultimately, the motive for the test is to gather a preliminary notion of what variables need further analysis. Snowmaking acreage, terrain acreage and number of trails all show a strong correlation to visits and thus are used in equation 2. These variables are relied upon to prevent omitted variable bias and give a more accurate interpretation of snowfall and ski visits. In figure 13, snowfall again portrays statistical significance with a p-value of 0.076 and coefficient of -0.141. Despite statistical significance, the OLS model does not account for fixed effects, an important critique to the results.

iii. Fixed Effects

Holding differences across resorts constant, fixed effects yielded no correlation between ski visits and snowfall. When looking at figure 14, neither natural log of snowfall nor natural log of population are even slightly significant in relation to visits but natural log of income is. The natural logs of snowfall, population and income each exhibit p-values of 0.448, 0.331, 0.077 and coefficients of -0.03, 0.12 and -0.12, respectively. Because income displays a correlation to ski visitation, the variable must be utilized for omitted variable bias purposes moving forward. In figure 15, the natural log of snowfall and natural log of income show no statistical significance. The p-value of snowfall decreases relative to the previous test but not to a level which highlights a noteworthy relationship with ski visits (0.212). The coefficient at this level is -0.04 meaning a 1 percent increase in snowfall results in a -0.04% decrease in ski visits. Given the p-value, however, the coefficient is irrelevant as the confidence interval is between a negative and positive number. The final fixed effect result, expressed in figure 16, draws the relationship between ski visits and snowfall by year with income as a control variable. In practice, this could give a richer testament to which year, if any, portrays some type of relationship but the resulting p-value of snowfall shows a lack of significance to visits when looking at the relationship annually. The coefficients by year highlight how many more people on average skied during that year. We know this because the time fixed effect is accounted for in the regression.

iv. Quantile Snowfall Test

Consistent with fixed effect results, no statistical correlation is found between ski visits and snowfall when looking at the six quantiles grouped by mean snowfall. The most interesting finding in figure 17 is the result for quantile 6. By definition, this quantile reflects a heavy snowfall season; one that is considerably above average. A p-value of 0.800 shows relative to the rest of the quantiles, heavy snowfall leads to the least responsive behavior of skiers. The notion that wherever there is more snow, more people will be skiing is proven false by this quantile.

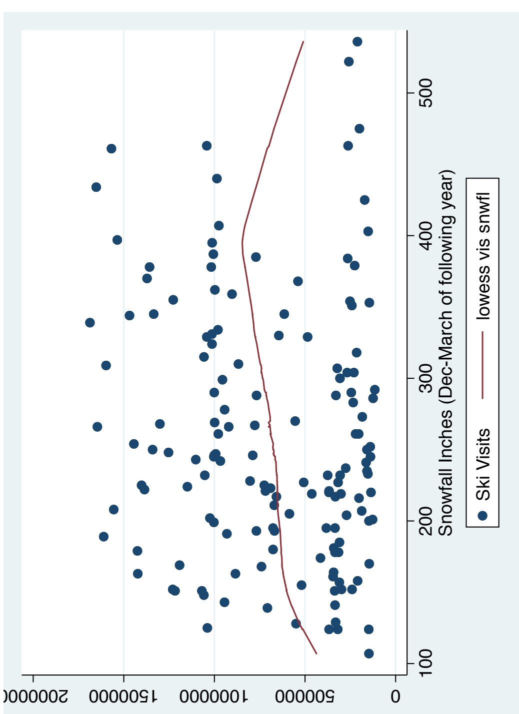
v. Snowfall Threshold

Snowfall thresholds for below average snowfall ($x < 200$ in), average snowfall ($240 < x < 280$ in) and above average snowfall ($x > 350$ in) found no significance in relation to snowfall as well. This test served as a lower bound effect, discovering if a minimum threshold of snow influenced skiers. Inch increases in snowfall were tested individually in below average, average and above average groups. Findings included a lack of relationship between ski visits and snowfall for almost all levels tested. There would be instances in which x amount of snowfall would have a relationship with ski visits but this was rare. I hypothesize that because an incremental increase in snowfall may coordinate with 2-5 more data points used in the regression, overweighting the relationship became a byproduct. Figure 18, 19 and 20 shows three graphs which highlight below average (180 inch), average (270 inch) and above average (380 inch) thresholds, respectively.

Conclusion

Based on the analysis provided, no statistical relationship was apparent between ski visits and snowfall. Lowess curve graphs, ordinary least squares, fixed effects, quantile snowfall tests, and snowfall thresholds were all used as econometric methods to find a correlation but yielded no convincing evidence. This paper shows there should be considerable doubt that the Colorado ski industry will be impacted by climate change in future years. The lack of correlation between ski visits and snowfall implies future snowfall volatility should be met unresponsively by Colorado skiers. Previous literature finds a relationship between the variables but one that is extremely small. Reasons why Falk and Gosnell find a relationship between ski visits and snowfall exploit the limitations in this paper’s analysis. For one, no data was used that conveyed snow conditions per day and a skier’s responsiveness. This would offer a more accurate demonstration of ski visits and snowfall and could drastically differentiate results. Given how hard it was in this research to obtain aggregated ski visits, data on daily ski visits and daily snow conditions seems unfeasible. Second, the timeline used in this paper is only ten years which is relatively short. For a more robust analysis, more data points which include ski visits and snowfall over a longer period of sampled years may benefit the results. Because the sampled timeframe is only from 1995-2004, the analysis may be drawing from an anomaly in the ski industry in Colorado. Finally, data used in this analysis does not account for season pass holders. Over the past ten years, season passes to multiple mountains may have drastically changed skier behavior. Because multi-mountain season passes are affordable and owned by many skiers, preferences in ski mountains and their respective snow conditions may have changed. Moving forward, this paper finds merit in examining other variables that influence ski visits such as skiable acreage, snowmaking acreage, number of trails and income by county. Each of the variables showed a strong correlation to ski visits and would be interesting to examine further in a different analysis.

Lowess Curve Graphs



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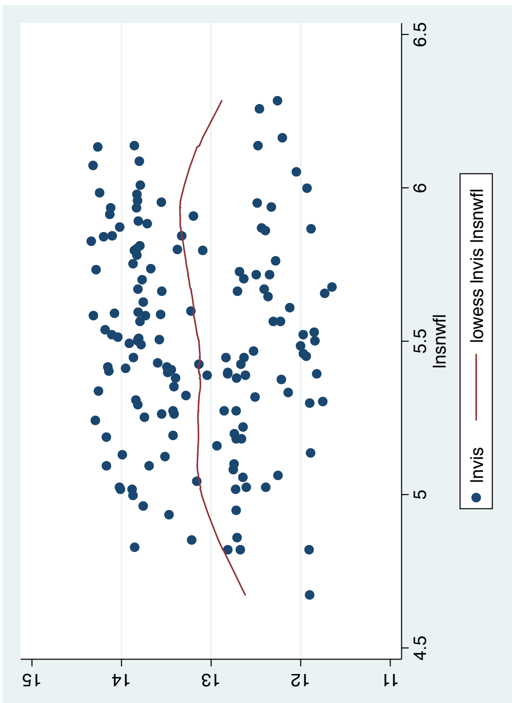
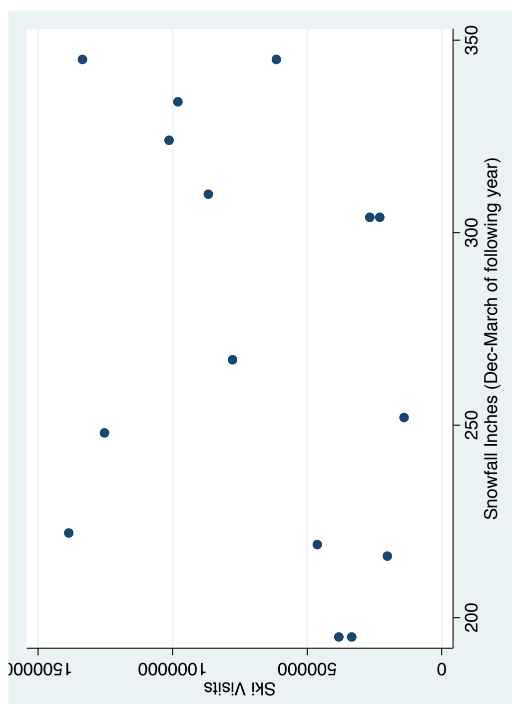
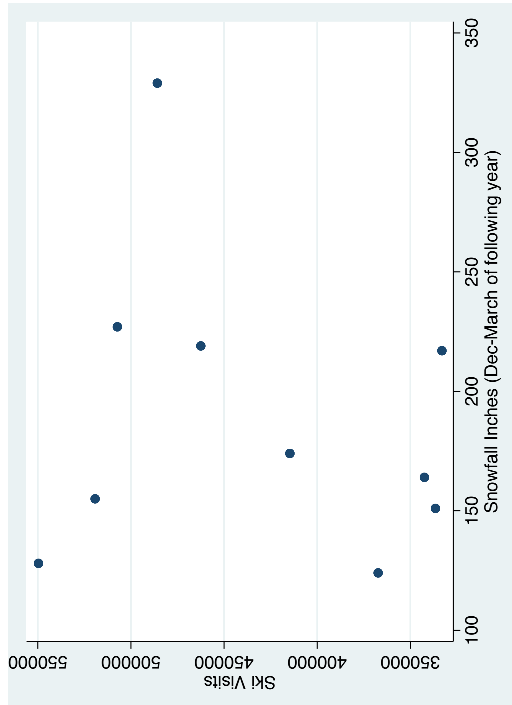


9



10



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OLS Results

lnvis	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnsnwfl	-.0690488	.041629	-1.66	0.100	-.1514443	.0133467
lnpop	-.1376124	.0616132	-2.23	0.027	-.2595621	-.0156626
lninc	-.0366383	.0661224	-0.55	0.581	-.1675131	.0942365
lnacre	.6674236	.0597203	11.18	0.000	.5492205	.7856267
lnvert	-.1832511	.1856077	-0.99	0.325	-.5506207	.1841186
lnpk	-3.826718	.4745679	-8.06	0.000	-4.766021	-2.887415
lndisden	.0100247	.1001929	0.10	0.920	-.1882851	.2083345
lndisair	-.3694147	.0881183	-4.19	0.000	-.5438255	-.1950038
lnlfts	.5554207	.1245901	4.46	0.000	.3088221	.8020193
lnsnwmkg	.2917173	.0832827	3.50	0.001	.1268776	.456557
lntrls	-.7083222	.1723429	-4.11	0.000	-1.049437	-.3672074
1.out	-.34089	.2155209	-1.58	0.116	-.7674663	.0856863
1.shp	0	(omitted)				
1.ngtlf	0	(omitted)				
1.dtwn	.4758291	.0534595	8.90	0.000	.3700178	.5816403
1.sznps	1.001163	.1365337	7.33	0.000	.7309241	1.271401
1.upscl	-.7185331	.096542	-7.44	0.000	-.9096166	-.5274495
_cons	48.9761	5.140959	9.53	0.000	38.80071	59.1515

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lnsnwfl	-.1410691	.0788798	-1.79	0.076	-.297069	.0149309
lnacre	.660711	.0681427	9.70	0.000	.5259457	.7954762
lnsnwmkg	.2213685	.0298743	7.41	0.000	.1622862	.2804507
lntrls	.6251308	.150254	4.16	0.000	.3279746	.9222871
_cons	4.751417	.5627272	8.44	0.000	3.638516	5.864319

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Fixed Effect Results

lnvis	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnsnwfl	-.0302399	.0397692	-0.76	0.448	-.1089072	.0484275
lnpop	.1229316	.1208636	1.02	0.311	-.1161486	.3620117
lninc	-.1289062	.0724329	-1.78	0.077	-.2721856	.0143732
_cons	13.54006	1.15494	11.72	0.000	11.25547	15.82465

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lnvis	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnsnwfl	-.045935	.0366581	-1.25	0.212	-.1184433	.0265733
lninc	-.0927086	.0630952	-1.47	0.144	-.2175085	.0320913
_cons	14.41644	.769167	18.74	0.000	12.89506	15.93782

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lnvis	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnsnwfl	-.0084967	.0453674	-0.19	0.852	-.0982915	.081298
lninc	-.0131362	.1190401	-0.11	0.912	-.2487499	.2224776
Year						
1996	-.0058747	.0423123	-0.14	0.890	-.0896226	.0778733
1997	.0405392	.0458144	0.88	0.378	-.0501403	.1312187
1998	.0597533	.0487283	1.23	0.222	-.0366936	.1562001
1999	.0356774	.0478452	0.75	0.457	-.0590216	.1303763
2000	-.0585737	.0543623	-1.08	0.283	-.1661719	.0490245
2001	.0209328	.060438	0.35	0.730	-.098691	.1405566
2002	-.0449207	.0524234	-0.86	0.393	-.1486813	.0588398
2003	.0406692	.0560099	0.73	0.469	-.0701901	.1515286
2004	.0118252	.0553971	0.21	0.831	-.0978211	.1214715
_cons	13.34885	1.276593	10.46	0.000	10.82211	15.87558

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Quantile Snowfall Results

lnvis	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnsnwfl	.0678053	.5186501	0.13	0.896	-.9575305	1.093141
lninc	1.099212	.2475215	4.44	0.000	.6098794	1.588546
q1	-.2179397	.5239104	-0.42	0.678	-1.253675	.8177954
q2	-.2751353	.4448127	-0.62	0.537	-1.1545	.604229
q3	-.1179705	.3756914	-0.31	0.754	-.8606866	.6247457
q4	-.2215738	.3260494	-0.68	0.498	-.8661511	.4230036
q5	-.1329226	.2992488	-0.44	0.658	-.724517	.4586717
q6	.067215	.2649307	0.25	0.800	-.4565348	.5909648
_cons	1.120833	3.910698	0.29	0.775	-6.610349	8.852015

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Snowfall Threshold Results

lnvis	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnsnwfl	-.0582237	.0477806	-1.22	0.225	-.1527385	.0362912
lninc	-.0905554	.0635202	-1.43	0.156	-.2162046	.0350938
_ID180_1	-.0157514	.0391029	-0.40	0.688	-.0931008	.061598
_IResort_2	.2968588	.0551151	5.39	0.000	.1878357	.4058818
_IResort_3	.9827861	.0531735	18.48	0.000	.8776037	1.087969
_IResort_4	1.74597	.0521442	33.48	0.000	1.642824	1.849116
_IResort_5	1.345068	.0522042	25.77	0.000	1.241803	1.448333
_IResort_6	.5202179	.0631811	8.23	0.000	.3952395	.6451963
_IResort_7	1.527054	.054391	28.08	0.000	1.419464	1.634645
_IResort_8	.0110982	.0527777	0.21	0.834	-.0933013	.1154977
_IResort_9	-.5633945	.0615067	-9.16	0.000	-.6850608	-.4417282
_IResort_10	1.125371	.0533588	21.09	0.000	1.019822	1.23092
_IResort_11	1.444341	.0525707	27.47	0.000	1.34035	1.548331
_IResort_12	.3050855	.0554988	5.50	0.000	.1953034	.4148677
_IResort_13	1.885004	.0526068	35.83	0.000	1.780943	1.989066
_IResort_14	1.400577	.0540613	25.91	0.000	1.293638	1.507515
_IResort_15	-.4187729	.0584577	-7.16	0.000	-.534408	-.3031378
_cons	13.69038	.7894301	17.34	0.000	12.12881	15.25195

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lnvis	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnsnwfl	.0146783	.052842	0.28	0.782	-.0898483	.1192049
lninc	-.0998228	.0629005	-1.59	0.115	-.2242461	.0246005
_ID270_1	.055125	.0347923	1.58	0.115	-.0136977	.1239477
_IResort_2	.3009101	.0541944	5.55	0.000	.1937082	.408112
_IResort_3	.9855405	.0519236	18.98	0.000	.8828304	1.088251
_IResort_4	1.73665	.0520136	33.39	0.000	1.633762	1.839538
_IResort_5	1.34182	.0517259	25.94	0.000	1.239501	1.444139
_IResort_6	.5147514	.0621912	8.28	0.000	.3917311	.6377717
_IResort_7	1.524894	.0533416	28.59	0.000	1.419379	1.630409
_IResort_8	.0135349	.0522584	0.26	0.796	-.0898372	.1169071
_IResort_9	-.5716711	.0612048	-9.34	0.000	-.6927403	-.4506018
_IResort_10	1.119947	.0529756	21.14	0.000	1.015156	1.224738
_IResort_11	1.440803	.0518743	27.77	0.000	1.33819	1.543416
_IResort_12	.2970886	.0545909	5.44	0.000	.1891024	.4050747
_IResort_13	1.885189	.0521333	36.16	0.000	1.782064	1.988313
_IResort_14	1.398396	.0535281	26.12	0.000	1.292512	1.50428
_IResort_15	-.4252364	.058089	-7.32	0.000	-.5401422	-.3103307
_cons	13.35401	.7947077	16.80	0.000	11.78199	14.92602

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lnvis	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
lnsnwfl	-.0576463	.0440225	-1.31	0.193	-.1447272	.0294347
lninc	-.0998657	.0649852	-1.54	0.127	-.2284128	.0286814
_ID380_1	-.0194164	.0401473	-0.48	0.629	-.0988317	.0599989
_IResort_2	.2925997	.0544826	5.37	0.000	.1848276	.4003717
_IResort_3	.9892078	.0526695	18.78	0.000	.8850223	1.093393
_IResort_4	1.748348	.0523793	33.38	0.000	1.644736	1.851959
_IResort_5	1.345129	.0521525	25.79	0.000	1.241966	1.448292
_IResort_6	.5127554	.0633626	8.09	0.000	.3874179	.6380929
_IResort_7	1.52134	.0540462	28.15	0.000	1.414431	1.628249
_IResort_8	.0099229	.0526517	0.19	0.851	-.0942275	.1140732
_IResort_9	-.56626	.0618498	-9.16	0.000	-.688605	-.443915
_IResort_10	1.127331	.0532887	21.16	0.000	1.021921	1.232741
_IResort_11	1.449433	.0524406	27.64	0.000	1.3457	1.553166
_IResort_12	.3082203	.0545533	5.65	0.000	.2003084	.4161322
_IResort_13	1.88545	.0525798	35.86	0.000	1.781442	1.989458
_IResort_14	1.397807	.0540975	25.84	0.000	1.290797	1.504817
_IResort_15	-.4210789	.0587745	-7.16	0.000	-.5373407	-.3048171
_cons	13.80143	.8466194	16.30	0.000	12.12674	15.47613

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