RECESSIONS AND RESORTS: HOW MACROECONOMIC DECLINE AFFECTS SKI RESORT ECONOMIES

A THESIS

Presented to

The Faculty of the Department of Economics and Business

The Colorado College

In Partial Fulfillment of the Requirements for the Degree

Bachelor of Arts

By

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May 2016

RECESSIONS AND RESORTS: HOW ECONOMIC DECLINE AFFECTS SKI RESORT ECONOMIES

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May 2016

Economics

Abstract

This thesis is a study of the economies of ski resort towns before, during, and after economic recessions, in particular the Great Recession of the U.S. Ski resort towns often have limited (and relatively expensive) housing, which threatens these economics because of the heavy reliance on a large service-based workforce. This study compares small ski resort towns and rural non-resort towns using median home values as the dependent variable. The data was analyzed using ordinary least squares regression. This study aims determine how the housing situation in resort communities changes during times of economic decline and times of economic growth.

KEYWORDS: resort, recession, ski, housing, home value, service industry, luxury good, unemployment, OLS, affordable home price

JEL CODES: D01, J11, J21, P25, R30, R31

ON MY HONOR, I HAVE NEITHER GIVEN NOR RECEIVED
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3 February 2016

ACKNOWLEDGEMENTS

Thank you to my thesis advisor, College Research Professor Kevin Rask, for his help gathering data, teaching econometrics, and assisting me with the entire thesis-writing process.

Thank you to my academic advisor, Professor Esther Redmount, for teaching me basic economic theory and guiding me through academic decisions during my time at Colorado College.

TABLE OF CONTENTS

I. INTRODUCTION

While the sport of skiing has existed as a mode of transportation since the Stone Age (National Geographic), the modern-day concept of the ski resort (which has more amenities than a ski area) was introduced to the United States in 1936 in Ketchum, Idaho. Shrewdly named Sun Valley, the resort was founded by the owner of the Union Pacific Railroad, W. Averell Harriman, as a way to attract passengers to trains in the American West (UPRR, 2006). Pools, bowling alleys, and golf, as well as the world's first chairlifts, attracted celebrities and politicians to the year-round, remote mountain retreat.

Eight decades after the establishment of Sun Valley, over 400 ski resorts are located throughout the United States, from California to Maine. The popularity of winter sports industry has exploded with the introduction of the XGames in 1995, and Americans have more days and money to spend on vacation than ever before (Trading Economics, 2015). This is evident in the number of days skied by Americans per year. According to the National Ski Areas Association, during the 2013-14 winter season, 9.6 million Americans skied and snowboarded, while 10.99 million people total skied or snowboarded at one or more of the 470 ski resorts in the United States (NSAA, 2015). Almost 9 percent more Americans skied during this season than in the 1996-97 season.

Modern ski resorts have become the major industry in many mountain towns, bringing in tourists who desire five-star hotels, Michelin-starred restaurants, world-class golf courses, spas, shopping, more flights and airlines, and businesses to support other activities, such as biking, fishing, and eco-tours. With so many amenities, attractions, and increased infrastructure, mountain ski resort towns see a large proportion of returning visitors—as high as 75% in Sun Valley—and many of these frequent visitors become

homeowners, buying vacation properties in these towns (TripAdvisor). Housing markets in ski resort towns are generally known to be relatively expensive and are limited in options due to desirability and the physically constrained mountainous areas in which ski towns exist. While an extremely popular housing market does not usually cause concern in a local economy, this trend does pose a problem for ski resort towns.

Resorts and resort towns require immense human capital to fulfill jobs in the service sector, such as dining, hospitality, housekeeping, lawn maintenance and landscaping, ski lift operators, ski patrol and instructors; the list is immense. However, many ski resort towns are isolated, and considering these communities are desirable locations to live or have a second home, housing options are very limited. For example, on September 14, 2015 in Jackson Hole, Wyoming, there were 113 full-time jobs and 12 part-time jobs available, but only 22 housing units for rent; approximately 91 percent of the available jobs are in the service industry (Jackson Hole News and Guide). On the same day in Aspen, Colorado, there were 287 local jobs—96 percent of which were service-related—but only 28 housing units for sale and 22 housing unit rentals (Aspen Times).

According to the May 2014 Annual Indicator Report for the Jackson/Teton County (Wyoming) Comprehensive Plan the job pool is in the country is growing faster than the worker pool (Graham, 2014). Paula Labian, Vice President of Human Resources at Winter Park Resort in Colorado, expressed concern for housing labor for the 2015-2016 ski season. “We do not have enough supply of housing throughout Grand County right now to be able to help with the number of employees coming in,” Labian said. “Not only for the resort but for the other employers as well.”

It is evident that a major housing shortage exists in desirable mountain resort towns, and so long as ski and mountain vacations remain a popular getaway for Americans, this trend is likely to escalate. However, another factor remains in the analysis of this type of economy—the impact of macroeconomic effects, namely recession times, on the housing and labor markets in ski resort towns. During the Great Recession, which began in 2008, ski resorts generally fared well. In 2009, "ski resort revenue rose 2.3% from the year before," and 2010 revenue rose almost 6% (Korkki, 2010). These numbers indicate that the ski resort industry is unlike most industries in terms of revenue during the time period, and perhaps housing shortages do not threaten the industry at a significant level.

If another recession were to occur, how would the economies of these mountain resort towns be affected? Or are these small communities relatively immune to macroeconomic threats? To answer these questions, this study will look at housing and labor statistics over the time period 2000-2015 for both non-resort and resort towns and compare trends before, during, and after the recession. This study will also use hedonic home pricing models to analyze how the given variables affect median home values.

II. LITERATURE REVIEW

While little literature exists directly on the topic of home values and recession economics in accordance with mountain resort communities, there are many studies that add explanatory value to this subject. This literature review will examine both broad and specific studies to learn more about home prices, mountain resort community economics, and the effects of recessions.

The 2009 study "What Happens during Recessions, Crunches, and Busts" by Stijn Claessens, M. Ayhan Kose and Marco E. Terrones details the characteristics defining the Global Recession. According to the National Bureau of Economic Research, a recession is "'a significant decline in activity spread across the economy, lasting more than a few months, visible in industrial production, employment, real income, and wholesale-retail trade" (NBER, 2001). For real estate specifically, a home price bust "is defined as a peak-to-trough decline which falls within the top quartile of all price declines" (Claessens, Kose, & Terrones, 2009). The study found that in one quarter of recessions, a home price bust was also occurring. Severe recessions are characterized as having "peak-to-trough decline in output [below] -3.15%."

One of the major variables included in this study is median home price, which includes values for all housing units—single-family homes, townhouses, duplexes, and condos. In order to properly analyze this variable, an understanding of home pricing models is necessary. The 2002 article "Estimating Neighborhood Effect in House Prices: Towards a New Hedonic Model Approach" by Raymond Y. C. Tse explains the hedonic house pricing model and attempts to find a model to correct for autocorrelation bias. This is important because, according to Tse, "quality of property and location tend to exhibit

highly autoregressive correlation due to spatial dependence and heterogeneity" (Tse, 2002).

Hedonic home price models take into account specific characteristics of the house—such as square footage, age, architecture, and craftsmanship—as well as the utility-driven attributes of the property—such as location, proximity to employment and recreation, social and economic status of the neighborhood, views, and quality of local schools and parks (Tse, 2002). Many home pricing models follow traditional location theory, which states that "housing and accessibility to employment [centers] are jointly purchased in that those paying higher prices [for housing units] are compensated by the lower costs of commuting to the central business district," according to Tse. This is key to this particular study because it emphasizes the necessity to eliminate communities that have commuter populations.

All home pricing models are stochastic due to the relationship between home prices and other location factors (besides location theory), which creates bias; for example, more expensive houses "could reflect the quality of the location that in turn induces more [expensive] property to be developed in that location." Spatial dependence also exists, where a home's location matters relative to neighboring homes' locations. This study will demonstrate this that particular bias, as the median home values in the resort locations are statistically higher than the median home values in non-resort locations. In his study, Tse creates a new stochastic model to reduce this bias. By including variables for location and property quality, the new model has a 7% lower SSE than the traditional OLS model. This means that location and property quality are very

important aspects of home valuation and will likely be big factor in the median home prices in this particular study.

Similarly, the study "Estimating the Effect of Air Quality: Spatial versus Traditional Hedonic Price Models" by Helen R. Neill, David M. Hassenzahl, and Djeto D. Assane (2007) looks to address limitations in OLS methods for hedonic home price models. However, instead of using relative location as the variable, this study uses the effects of air quality to estimate home values; this variable represents another instance of spatial dependence. Just as the previous article suggests that home prices reflect neighboring homes' prices, this article's researchers suspected that "consumers are willing to pay for environmental goods such as air quality." Instead of OLS, this study uses spatial maximum likelihood estimation (MLE) to "account for spatial autocorrelation," although the MLE method is less accurate in application to large data sets than the OLS method. Using data from Las Vegas, Nev., the researchers used a new hedonic home price equation ($P = f(X, Q, W, Z)$), where X=home characteristics, Q=market factors, W=neighborhood characteristics, and Z=environmental characteristics (air quality specifically). The regressions found that MLE resulted in more accurate results than OLS and that environmental characteristics significantly affected home prices. The study demonstrated a negative correlation between the two, where increased levels of air pollution (carbon monoxide and particulate matter) were significantly correlated with decreasing home prices.

While this particular study will not regress air quality or environmental characteristics as variables directly, these elements are still very important in interpreting results. Many of the mountain communities in this study likely have higher

environmental quality than the non-mountain communities because while the sample locations are each located over 60 miles from a major city, the landscape of mountain communities may result in less pollution. That being said, higher environmental quality may represent some of the valuable attractions of mountain communities—relatively untouched surroundings, smaller populations, and accessibility to outdoor activities. If this remains true, home prices in mountain communities will reflect trends in home prices with increased air quality.

The 2005 article "Why Have Housing Prices Gone Up?" by Edward L. Glaeser, Joseph Gyourko, and Raven E. Saks discusses pre-recession housing price trends in the United States. According to the article, "U.S. Census data [since 1970] shows that the standard deviation of [house prices] increased by 247%, compared with 72-percent appreciation in average prices, [and] this growing dispersion occurred mainly in the upper end of the distribution." This applies to the communities in this particular study because several of the counties in which these towns exist (Teton County, Wyoming and Pitkin County, Colorado) are in the top-10 highest mean incomes per county in the country (IRS, 2014).

A 2011 study by Sanjay K. Nepa and Tazim B. Jamal entitled "Resort-induced Changes in Small Mountain Communities in British Columbia, Canada" relates closely to this paper. Through counterurbanization and rural gentrification trends, people migrate from urban areas to more rural areas, creating high-value properties from low-value properties. Real estate prices increase as existing homes become more desirable, and resort destinations and second homes add to this pressure. The study also recognizes changes in consumer demand that come with changing demographics in rural areas, such

as “health- and service-based products, [gym] and spa facilities, yoga and meditation centers, spiritual retreats, [and] organic food vendors” (Nepa, 2011).

The Nepa and Jamal study included 5 study locations for resort communities in British Columbia. These locations had populations between 2,000 and 7,000 people and are located a minimum of 162 miles from Calgary, the closest major city. The study showed that British Columbia’s median household income increased 11% over a 5-year period. Although this rate is high, it is slightly lower than the average increase in real estate prices over the same time period. Additionally, more local residents than non-local residents in owner-occupied residences spend more than 30% of annual household income on housing costs.

This study found that within the 5 mountain communities, population within city limits is declining while the number of new residents is increasing; income does correlate to growth in housing prices; and of new residential units, the greatest growth is in ski resort-related real estate. Low snowfall years (attribute to climate change in the study) have adversely affected these communities during the 5-year time period, and many resort projects have been downscaled or cancelled completely.

The 2011 study “Winter Tourism, Climate Change, and Snowmaking in the Swiss Alps: Tourists’ Attitudes and Regional Economic Impacts” by Marco Pütz, David Gallati, Susanne Kytzia, Hans Elsasser, Corina Lardelli, Michaela Teich, Fabian Waltert, and Christian Rixen details the role of tourism in resort communities. Winter tourism contributed 26% of aggregate income between the three Swiss resort communities in the study, a high proportion of the 40% contribution from year-round tourism. The three communities are most easily accessible by railway and have populations between 500 and

12,000 people. This study modeled the potential impact of artificial snowmaking on the tourism industry and explains the influence adding value to a ski resort has on the entire economy of the community. The study found that artificial snowmaking, in years of below-average snowfall, would prevent a single community from losing up to 10% of regional factor income attributed to the resort's tourism. This means that not only would the ski resorts in these communities cut losses, but the railway, hospitality, and restaurant systems would each cut losses by 3% by the addition of artificial snow. This dramatic influence demonstrates the reliance small communities have on tourism and ski resorts.

Published in 2013, the "Employee Generation by Land Use Study" by Clarion Associates analyzes housing and employment trends over time in Jackson, Wyoming. This study compares median home prices to the "calculated affordable housing price" for a county, which is 333% of median household income in the county. The study reports that in 1986, median sales prices of homes ($90,000) aligned with the affordable housing price for the county based on median incomes. However, this was the last year in which the true median home price aligned with the calculated affordable price. In 2007, before the Great Recession, "the median sales price ($1,075,000) was approximately four times the price affordable to a median household income ($270,000)" (Clarion, 2013). After the recession, in 2012, the median sales price of housing was 2.7 times the affordable price.

With real estate as one of the most volatile sectors during the Recession, it is important to analyze pre- and post-Recession trends in home values in mountain resort towns. In an October 2009 column in the Jackson Hole News and Guide in Jackson Hole, Wyoming, economist Jonathan Schechter explains the local housing market, as it had stabilized by this point. Between fall 2007 and fall 2009 in Jackson Hole, total annual

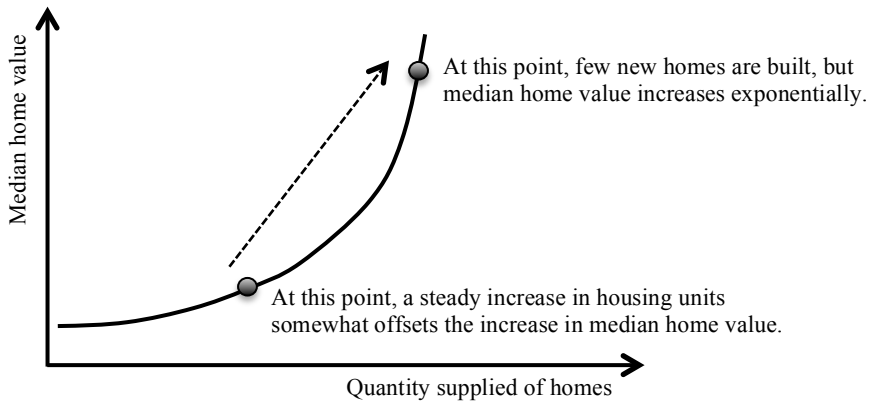
real estate sales fell 72%, from $1.13 billion to $318 million, which followed national trends. This decline was particularly devastating to workers in the area because "in 2007, construction and real estate in [Jackson Hole provided] more jobs and more income than any other sector, including tourism and retail." While all mountain resort towns may not have followed this decline exactly, this data demonstrates the reaction of this type of local economy to the national economy.

According to a January 2015 interview on GoBreck.com, the Breckenridge, Colo. ski area is on track to have a record year in terms of revenue. Tourists visited Breckenridge Mountain Resort in record numbers—occupancy was up 9% over the previous season—and the ski area charged the highest average daily ticket price—up 7%—in its history. In fact, revenue across all mountain resorts nationally is up almost 15%. Clearly, the mountain resorts that did not close during the Recession were able to bounce back; however, the impact of economic downturn for these communities remains undefined.

III. THEORY

This study will use microeconomic theory to explain trends in housing markets. At the most basic level, housing markets always move to general equilibrium in terms of pricing. As demand for housing increases in a market, new housing units will be built to meet demand. However, at some point, the rate of new housing units will slow to the point where supply will remain relatively steady. At this point, the supply curve of housing units is nearly vertical, as changes in prices will have almost no effect on the number of housing units in the market, as shown in this graph:

FIGURE 3.1

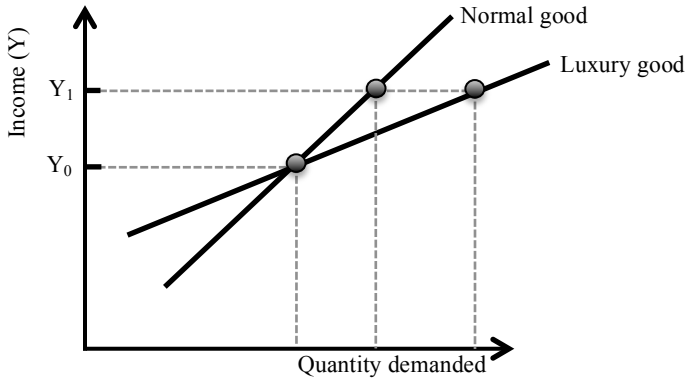


When this happens, the price of housing units will increase at a steep rate and the housing market will become more profitable. All intermediaries in the housing industry will also increase prices, such as contractors, materials suppliers, realtors, and materials. The entire system becomes interdependent. As explained by D.W. Dwivedi, the desirability of a housing market increases, and as a result, "larger factor incomes flow to the households" (Dwivedi, 2006).

For this particular study, discussion will consider the concept of vacation homes, which is the main factor of differentiation between resort communities and non-resort

communities. Vacation homes are considered a luxury good, which means that as income increases, consumers are more likely to purchase this good, which is not a commodity good. Luxury goods have an upward sloping demand curve that is more horizontal than a normal good because luxury goods are inherently more expensive. This means that income and the purchasing of a vacation home are not proportionally coordinated. This graph, FIGURE 3.2, depicts the relationship between income and the quantity purchased of a good:

FIGURE 3.2

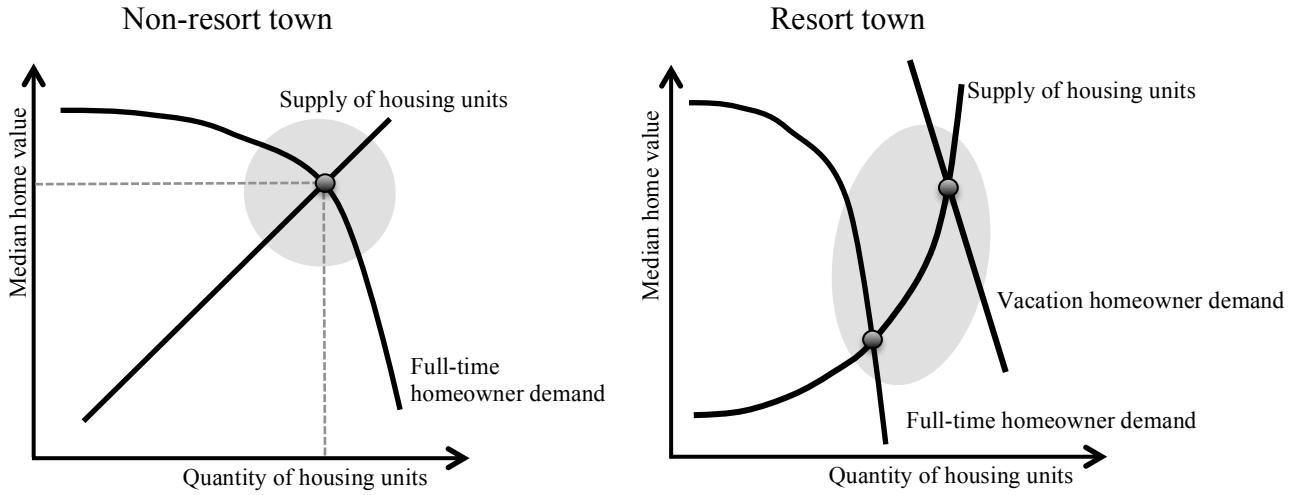


However, not all homes in resort areas are vacation homes. In this study, approximately 28% of the homes in the resort towns are considered to be second homes. This leaves the majority of homes under the ownership of full-time residents, many of whom likely work in the resort town. These residents do not have the same demand curve as their second homeowner neighbors. In general, homes are considered normal goods, even though most people have only one. In reference to the above graph, the "quantity demanded" of homes doesn't necessarily increase incrementally with income, but "quantity demanded" can be interpreted as square footage, size of yard, quality of neighborhood and schools, etc. For normal homes, value increases relatively proportionally to income. Full-time residents

have a theoretically higher price sensitivity of demand than vacation homeowners because full-time residents' homes are normal goods, not luxury goods.

This study compares resort and non-resort towns. The majority of homes in non-resort towns are primary residences, while homes in resort towns are both primary residences and vacation homes. Because all of the communities in this study are relatively small (with populations of less than 45,000), a clear distinction exists between the normal housing market and the luxury (vacation) home market. This means that the study will observe several effects of supply and demand over time within the data set. The following graphs compare the supply and demand trends between resort and non-resort towns. The gray shaded areas indicate the supply and demand levels occurring in this study.

FIGURE 3.3



As depicted in the graphs in FIGURE 3.3, supply and demand in non-resort towns is relatively simple compared to resort towns. In non-resort towns, full-time homeowners are elastic to price changes and change preferences according to price. Because

population density is smaller in non-resort towns, homes are built at a steady rate. This could be true because non-resort towns are in less mountainous areas than resort towns and therefore more land on which to build exists in non-resort towns.

In resort towns, there are two consumers: vacation homeowners and full-time homeowners. Vacation homeowners are inelastic to changing prices because these individuals have more spending power and are purchasing a luxury good. Full-time owners are very elastic to changing prices when homes are most expensive because these individuals have lower buying power than vacation homeowners and can become priced out of the market quickly. However, with lower median home values, full-time homeowners become more inelastic because their sensitivity to prices is somewhat dulled by the fact that these individuals work and live in the town full-time. In consideration to the supply of homes in resort towns, the rate of supply decreases over time as more land area is used. These trends result in vacation homeowners having higher median homes values than full-time homeowners. Also, vacation homeowners constitute approximately one-third of homeowners in resort areas (full-time homeowners own the other two-thirds of homes). In reference to FIGURE 3.3, the median home value that corresponds with the resort town model is dependent on the proportion of full-time homeowners versus vacation homeowners.

With increased home prices in either resort or non-resort towns, budget constraints become an ever-important factor as more consumers (potential homebuyers) face limited buying power. As more housing units move beyond a consumer's budget constraint, consumers must change their preferences to find a housing option within or on their individual budget line. In the case of this particular study, changing consumer

preferences can mean many things. For prospective vacation homeowners, a restrictive budget constraint can mean that the consumers downsize their preferences (from a single-family home to a condo, for example), choose a new location to vacation within the household's budget constraint, or even become priced out of the market entirely. The opportunity cost of owning a vacation home may no longer be justifiable in terms of the consumer's preferences. However, budget constraints more likely affect full-time homeowners. For these individuals, a more restrictive budget constraint can force households to downsize, move further from work and face longer commutes, or be priced out of the market.

Market demand in this particular study, which looks at resort areas, differs from market demand in residential areas because the price elasticity of demand for consumers of vacation homes is relatively inelastic. This demographic of consumer has more purchasing power than an average consumer, which affects the effective market demand. Resorts inherently have high desired or ex-ante demand, which is the desirability of a market before consumers interact with the market (Harvard Publishing). This means that this type of market has high pent-up demand. However, factors such as supply constraint, which is very applicable to this situation, result in differing realized or ex-post demand. Not every consumer who can afford a vacation home can find one in within his or her price range and preferences due to limited supply.

IV. DATA DISCUSSION

With the popularity of skiing and ski resorts on the rise, this study aims to recognize trends in housing, employment, and demographics in these communities over time. The objective of recognizing these trends is to add explanatory value to resort town economies and to help predict future trends. The variables in this study were specifically chosen as major defining factors in a community, meaning the variables identify significant housing, employment, or demographic influences.

This section will present the variables used in the regression and the model used to regress the data. For this data regression, "area keys" (which are U.S. Census-designated block groups that are not standard in size but do not change over time) will be treated as individuals. Most area keys will be grouped into the dummy variable for resort, which indicates whether the town is a ski resort community or a non-resort community. All of the variables in this study came from Geolytics, which combines U.S. Census data, the Consumer Expenditure Survey, and other demographic data, estimates, and projections.

The data in this study comes from the most recent U.S. Census survey data, and it represents information from 2000 through the projections for 2015. This time period was specifically chosen to include the Great Recession and eliminate the recession in the U.S. in the early 1990s and its aftereffects.

In the year this study began (2000), ski resorts in the U.S., on average, were experiencing average, steady growth (Teton Housing Survey, 2013). By 2015, after the defined recession era, ski resorts were again experiencing steady growth, and had been for several years (Teton Housing Survey, 2013). This timeline will allow the study to

observe average growth in these communities as well as a very defined and extreme recession period. Including a major macroeconomic event will allow the model to be more accurate and better predict future events.

Model, variables, and data set

$$medhomevalue = A + \beta_1 unemprate + \beta_2 pctinpov + \beta_3 medage + \beta_4 avghhsize + \beta_5 medincome + \beta_6 popdensity + \beta_7 propvacahu + \beta_8 propownedhu + \beta_9 propwhite + e$$

Dependent variable:

- *medhomevalue:* Median home value for all homes within the zip codes

Independent variables:

- *unemprate:* Unemployment rate at area key-level for a given year
- *resort:* Dummy variable where *resort=1* represents a resort town and *resort=0* represents a non-resort town; use this variable to sort regressions
- *pctinpov:* Percent of the population categorized as at or below the national poverty threshold
- *totalpop:* Total estimated population for each town/*areakey* in the study
- *medage:* Median age for all full- and part-time residents within each town
- *totwhitepop*: Total white non-Hispanic population within town
- *avghhsize:* Average household size in any housing unit
- *totalhu:* Total housing units (single-family homes, condos, townhomes, etc.) in each town
- *medincome:* Median household income for all residents, both full- and part-time, within each town
- *popdensity:* Estimated population density; more descriptive than *totalpop* because this variable controls for discrepancies in the "blocks" in which *totalpop* is estimated
- *vacanthu:* Total housing units that are not a primary residence, such as a vacation/second home

- *propvacahu*: Proportion vacation homes = (*vacanthu* / *totalhu*)
- *propownedhu:* Proportion of homes with owner as primary resident = (*ownerhu* / *totalhu*)
- *prophispanic:* Proportion of population that identifies as Hispanic = (*tothispanicpop / totalpop)*

These variables will be used to analyze the towns, which are grouped into resort and non-resort towns. The communities in this study are relatively small—with populations between 2,000 and 45,000 people—to ensure that the ski resort plays a major role in the economy of the town. The communities are also all at least 80 miles (over an hour of driving) from a major city in order to assume that most local workers do not commute from neighboring areas. All of the selected towns were chosen randomly, but they all come from the same states—California, Colorado, Idaho, New York, Montana, Wyoming, Vermont, and New Hampshire—to minimize errors coming from different economies and tax structures.

The following are the 17 non-resort and 17 resort communities, chosen as randomly as possible, with the name of the major local ski resort(s) in parentheses for the resort towns:

Non-resort towns

- *Fruita, Colorado*
- *Cody, Wyoming*
- *Dillon, Montana*
- *Hanover, New Hampshire*
- *Salida, Colorado*
- *Burlington, Vermont*
- *Eureka, California*

- *Lander, Wyoming*
- *Alamosa, Colorado*
- *Twin Falls, Idaho*
- *Sterling, Colorado*
- *Salmon, Idaho*
- *Helena, Montana*
- *Montpelier, Vermont*
- *Traverse City, Michigan*
- *Glenwood Springs, Colorado*
- *Watertown, New York*

Resort towns

- *Jackson Hole, Wyoming (Jackson Hole Mountain Resort, Snow King Resort)*
- *Aspen, Colorado (Aspen Mountain, Highlands, Snowmass, Buttermilk)*
- *Breckenridge, Colorado (Breckenridge Ski Resort)*
- *Steamboat Springs, Colorado (Steamboat Ski Resort)*
- *Telluride, Colorado (Telluride Ski Resort)*
- *Vail, Colorado (Vail Mountain Resort)*
- *Sun Valley, Idaho (Bald Mountain, Dollar Mountain)*
- *South Lake Tahoe, California (Heavenly, Kirkwood, Mt. Rose, Northstar, Squaw, Sierra)*
- *Stowe, Vermont (Stowe Mountain Resort)*
- *Newbury, New Hampshire (Mount Sunapee Resort)*
- *Tahoe City, California (Squaw Valley, Homewood Mountain)*
- *Mammoth Lakes, California (Mammoth Mountain)*
- *Lake Placid, New York (Whiteface Mountain)*
- *Big Sky, Montana (Big Sky Resort)*
- *Lincoln, New Hampshire (Loon Mountain)*
- *Warren, Vermont (Sugarbush Resort)*
- *Gaylord, Michigan (Otsego Club and Resort)*

Methodology

Analysis of this data began with creating confidence intervals for the variables in order to compare the non-resort community data and the resort community data. These confidence intervals confirmed that in terms of the variables, non-resorts and resorts are significantly different from each other, and for that reason, all of the variables were kept in the data set. The data was next tested with the variable inflation factor (VIF) to test for multicollinearity within the model. The data passed this test (explanation through Section V), so no variables were excluded or deemed insignificant as a result of this test. The data was regressed with ordinary least squares (OLS) regression using STATA, a statistical software application. The data was also used to create graphs as visual aids and perform other calculations that add explanatory value to the study.

V. RESULTS

When beginning to analyze the data set, which has a total of 6,130 observations, it is important to determine if significant differences exist between resort and non-resort communities. The variables in the data set will be tested at the 95% level of confidence, a safe indicator of significance for this study. Below are average confidence intervals between the years 2000 and 2015 for variables that describe the data set in order to demonstrate observable fundamental differences between resorts and non-resorts.

FIGURE 5.1

Variable	Non-resort confidence interval	Resort confidence interval	Significant?
medhomevalue	165,127 - 170,494	386,063 - 416,027	Yes
unemprate	7.921 - 8.423	6.533 - 7.108	Yes
pctinpov	10.90 - 11.55	5.557 - 6.127	Yes
medage	42.50 - 42.94	43.49 - 44.02	Yes
avghhsize	2.366 - 2.389	2.321 - 2.350	Yes
medincome	40,347 - 41,384	52,621 - 54,502	Yes
popdensity	2,834 - 3,067	1,395 - 1,610	Yes
propvacahu	.0840 - .0884	.2426 - .4025	Yes
propownedhu	.5487 - .5615	.3609 - .4406	Yes
prophispanic	.0782 - .0853	.1090 - .1224	Yes
propwhite	.8243 - .8336	.7986 - .8149	Yes

As demonstrated above, the differences in characteristics between non-resort and resort communities differ significantly—for every dependent and independent descriptive variable in the study. The data set shows that non-resort communities have significantly cheaper housing, higher unemployment, higher poverty, younger populations, larger household sizes, lower incomes, higher population density, fewer vacation homes, more homeowners, fewer Hispanics, and more white non-Hispanics than resort communities. Most of these differences make intuitive sense. For instance, one could easily guess that a

resort community would likely have more vacation homes than a non-resort community and that people living in the resort communities might be older because people often retire to resort communities. (More likely it's second-home owners.)However, the resort community residents are only slightly older than the non-resort community residents (by only a couple of years), which could be due to the harsh winters at ski resorts; people may find places with milder climates at which to retire.

While it may seem surprising that resort towns have a higher Hispanic population than non-resort towns, this can be explained by the fact that resort towns require a large service industry, which is often staffed by minorities. This can also help explain why resort communities have a lower population of whites; the service industry is not entirely comprised of Hispanics—other minorities (and some of the white population) work these critically necessary jobs as well. The high volume of jobs results in a lower unemployment rate for resort towns than non-resort towns. These significant differences in variables will help in further examining trends over time between the two types of communities. Now that demonstrable differences between resort and non-resort characteristics have been established, further analysis will examine whether or not the two types of communities behave similarly despite characteristic differences.

This data spans the years 2000 through 2015, which means that it includes a time of major economic downturn—the Great Recession in the U.S., which officially lasted from December 2007 to June 2009 (SOWA). For that reason, the data is divided into three time periods: pre-recession (2000-2006), Great Recession (2007-2009), and post-recession (2010-2015). From these three sets, the data is divided up once more between resort communities and non-resort communities because, firstly, this study is comparing

the two groups, and secondly, the two groups vary significantly, as demonstrated in FIGURE 5.1. After these divisions, the data is arranged in six distinct, non-overlapping groups. Regressions in this study will compare the same time periods between resort and non-resort communities in order to determine whether these groups act similarly or differently in response to economic change.

Testing the data

One of the first characteristics to check in the entire data set is the variable inflation factor (VIF) for the independent variables. The VIF will test for multicollinearity in order to ensure that none of the independent variables included in the model predict another independent variable. The following table lists the variable inflation factors for the data set.

Variable	VIF	1/VIF
propownedhu	18.93	0.052817
propvacahu	17.78	0.056250
avghhsize	1.89	0.528769
medage	1.89	0.529803
popdensity	1.58	0.631118
propwhite	1.58	0.631176
medincome	1.56	0.640281
pctinpov	1.55	0.646581
resort	1.35	0.741926
unemprate	1.15	0.868641
Mean VIF	4.93	

As illustrated here, the Mean VIF is 4.93, which is a low enough value to signify no multicollinearity throughout the model. This value means that the model estimates are not insignificant because the calculated standard errors are reasonable given the coefficients. While *propownedhu* and *propvacahu* have relatively higher VIFs than the other variables, this does not present a problem to the model because these two variables are highly correlated; higher proportions of vacation homes are correlated with lower rates of home ownership and vice versa in this particular data set.

Regressions and interpretation of the data

After securing that little unwanted correlation exists in the data set, the six models used in this study can be established. The first two models illustrate pre-recession non-resort communities and resort communities during the time period 2000-2006.

FIGURE 5.2

Non-resort 2000-2006

Source	SS	df	MS	Number of obs	=	1,704
				F(9, 1694)	=	129.41
Model	4.9839e+12	9	5.5377e+11	Prob > F	=	0.0000
Residual	7.2491e+12	1,694	4.2793e+09	R-squared	=	0.4074
				Adj R-squared	=	0.4043
Total	1.2233e+13	1,703	7.1832e+09	Root MSE	=	65416

medhomevalue	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
unemprate	664.38	380.679	1.75	0.081	-82.27067	1411.031
pctinpov	291.4243	209.6428	1.39	0.165	-119.7618	702.6103
medage	-273.428	364.1231	-0.75	0.453	-987.6064	440.7504
avghhsize	-70089.58	6739.103	-10.40	0.000	-83307.42	-56871.74
medincome	4.986261	.173289	28.77	0.000	4.646378	5.326144
popdensity	-.0618743	.5463121	-0.11	0.910	-1.133392	1.009643
propvacahu	-88549.53	26629.38	-3.33	0.001	-140779.5	-36319.59
propownedhu	-40526.37	12676.59	-3.20	0.001	-65389.78	-15662.95
propwhite	-71479.49	15391.07	-4.64	0.000	-101667	-41291.98
_cons	238028.1	29021.7	8.20	0.000	181105.9	294950.2

Resort 2000-2006

Source	SS	df	MS	Number of obs	=	732
				F(9, 722)	=	71.96
Model	3.1063e+13	9	3.4515e+12	Prob > F	=	0.0000
Residual	3.4630e+13	722	4.7965e+10	R-squared	=	0.4729
				Adj R-squared	=	0.4663
Total	6.5694e+13	731	8.9868e+10	Root MSE	=	2.2e+05

medhomevalue	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
unemprate	-11921.34	2568.222	-4.64	0.000	-16963.41	-6879.261
pctinpov	2769.325	1755.288	1.58	0.115	-676.754	6215.404
medage	-326.6382	1931.788	-0.17	0.866	-4119.231	3465.954
avghhsize	-132809.9	42082.86	-3.16	0.002	-215429.3	-50190.55
medincome	9.345773	.5502692	16.98	0.000	8.265454	10.42609
popdensity	-5.329806	5.127672	-1.04	0.299	-15.39673	4.737122
propvacahu	-177711.5	72358.63	-2.46	0.014	-319770	-35653.05
propownedhu	-771517.7	104245.9	-7.40	0.000	-976179.1	-566856.3
propwhite	189771.2	81652.82	2.32	0.020	29465.93	350076.6
_cons	523078.1	154595.5	3.38	0.001	219567.6	826588.6

Source: Author's calculations

This time period (2000-2006) is characterized by economic growth, record-high home values, and high proportions of home ownership (as opposed to renters). Analysis of this

time period will reference FIGURE 5.2. At the 95% level, *pctinpov*, *medage*, and *popdensity* are insignificant in both models, while *unemprate* is insignificant in the non-resort model. The percentage of the population in poverty is not significantly correlated with median home value because impoverished people likely rent their homes or live in subsidized housing, which is not factored into U.S. Census housing data. For both models, median age has an insignificant negative coefficient on median homes values. This could be because young consumers rent housing units that could be valued higher than the homes older consumers actually own—not rent. Population density is not particularly significant—in this time period or any of the following time periods—because a ski-in ski-out condo unit could have the same value as a large ranch property far from town.

However, the unemployment rate affects median homes prices differently in resort and non-resort communities. In non-resort communities, *unemprate* has an insignificant coefficient of 664; in resort communities, it has a significant coefficient of -11,921. The negative coefficient is more representative of housing market trends in the United States generally. High unemployment rate and low home values are both strongly correlated to economic downturn, which does not mean necessarily a one-point increase in unemployment directly causes an average home to lose $11,921 in value because these two results can occur simultaneously.

In both models, average household size has a strong negative correlation to median home value with coefficients of -70,089 for non-resort communities and -132,809 for resort communities. Household size does not mean number of bedrooms or number of square feet in a housing unit, and it is important to note that the U.S. Census data looks at the same blocks of houses over time. So, this figure's negative value could mean that

despite high economic growth in these areas during the time period, increased household size—which could mean "squeezing" more people into a housing unit—would decrease the value of homes in that particular neighborhood.

Another significant variable, proportion of white non-Hispanics, affects non-resort and resort home values differently. In non-resort towns, the coefficient is -71,479 as opposed to a coefficient of 189,771 in resort towns. Non-resort towns have a slightly higher proportion of whites than resort towns, but both have around 80% white non-Hispanics. (This high proportion of whites is expected because all of the towns in this study are small and relatively remote, and rural towns typically have lower minority populations than urban centers.) This coefficient is difficult to explain for non-resort communities. For resort communities, however, this coefficient can be explained by the large service industry in resort towns. Many minorities move to resort towns to work in the necessary service industry, which is inherently low-paid, so many service industry workers live in relatively lower-value housing units (Teton Housing Survey). Of course, many whites also work in the service industry, and both non-whites and whites live in high-value housing units, but this trend still holds true across these particular towns. Therefore, this coefficient could mean that an increase in whites means a decrease in service industry workers, which results in higher-value housing.

The coefficient on *medincome* for both non-resort and resort models is significant and positive, as expected. However, this variable is interesting because it demonstrates a difference in buying power between non-resort towns and resort towns. For a one-dollar increase in *medincome* in a non-resort town, *medhomevalue* increases by $4, but for the same increase in income in a resort town, *medhomevalue* increases by $9.

The next time period, 2007 through 2009, includes the official Great Recession in the U.S. as defined by the Bureau of Labor Statistics.

FIGURE 5.3

Non-resort 2007-2009

Source	SS	df	MS	Number of obs	=	568
				F(9, 558)	=	42.85
Model	1.9553e+12	9	2.1726e+11	Prob > F	=	0.0000
Residual	2.8293e+12	558	5.0705e+09	R-squared	=	0.4087
				Adj R-squared	=	0.3991
Total	4.7847e+12	567	8.4386e+09	Root MSE	=	71207

medhomevalue	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
unemprate	230.3549	404.7694	0.57	0.570	-564.703	1025.413
pctinpov	120.0914	361.5713	0.33	0.740	-590.1159	830.2987
medage	58.35259	827.3341	0.07	0.944	-1566.717	1683.422
avghhsize	-72338.73	13050.08	-5.54	0.000	-97972.01	-46705.44
medincome	5.31243	.3240504	16.39	0.000	4.675923	5.948938
popdensity	.9689911	.9830966	0.99	0.325	-.9620313	2.900014
propvacahu	-160429.5	51025.71	-3.14	0.002	-260655.5	-60203.6
propownedhu	-50178.53	24237.88	-2.07	0.039	-97787.16	-2569.894
propwhite	-90936.41	27885.49	-3.26	0.001	-145709.8	-36163.04
_cons	272792.7	56349.25	4.84	0.000	162110.2	383475.3

Resort 2007-2009

Source	SS	df	MS	Number of obs	=	244
				F(9, 234)	=	26.90
Model	1.1760e+13	9	1.3067e+12	Prob > F	=	0.0000
Residual	1.1366e+13	234	4.8571e+10	R-squared	=	0.5085
				Adj R-squared	=	0.4896
Total	2.3126e+13	243	9.5169e+10	Root MSE	=	2.2e+05

medhomevalue	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
unemprate	-9925.094	2393.265	-4.15	0.000	-14640.19	-5209.993
pctinpov	1438.136	2880.475	0.50	0.618	-4236.843	7113.115
medage	4746.211	4137.188	1.15	0.252	-3404.686	12897.11
avghhsize	-48349.25	74250.12	-0.65	0.516	-194633.4	97934.89
medincome	8.631533	.9901999	8.72	0.000	6.680687	10.58238
popdensity	-1.513588	8.269446	-0.18	0.855	-17.80567	14.77849
propvacahu	-165706.8	126694	-1.31	0.192	-415313.5	83899.83
propownedhu	-895627	178990.5	-5.00	0.000	-1248266	-542988.2
propwhite	154057.4	129066.4	1.19	0.234	-100223.1	408338
_cons	301867.9	292022.1	1.03	0.302	-273460.4	877196.2

Source: Author's calculations

The Great Recession of the U.S. officially lasted from December 2007 through June 2009, so the two models for this time period (reference to FIGURE 5.3) include some pre-recession and post-recession months. While this could potentially skew the regressions,

most of these months likely represent economic downturn even if the economic downturn was not at the official "recession" level. For example, although the recession officially ended in June 2009, the economy didn't necessarily start booming immediately in July 2009. Additionally, the official Great Recession is defined for the entire United States, which includes all urban centers. The rural areas and resort areas in this study may have experienced different dates for economic recession than the rest of the United States. This could explain why many of the independent variables in this time period in the two models have insignificant effects on median home values. For the non-resort model, the insignificant independent variables at the 95% level are: *unemprate*, *pctinpov*, *medage*, and *popdensity*. In the resort model, the insignificant variables are: *pctinpov*, *medage*, *avghhsize*, *popdensity*, *propvacahu*, and *propwhite*. Despite these poor fits for some variables, the non-resort and resort models still have high R-squared values relative to the other models in this study: 0.41 and 0.51 respectively.

The signs of the coefficients for the significant variables in FIGURE 5.3 are the same as the signs of the significant variables in FIGURE 5.2. For example, the non-resort coefficient for *medincome* is 5.3 and the resort coefficient is 8.6—similar to the pre-recession models. Despite the existence of a recession, it appears that a one-dollar increase in median income still results in greater buying power for higher-income households, perhaps because more housing units exist at higher prices than lower prices.

The last two models in this study cover the time period 2010 through 2015. This period begins six months after the official end to the Great Recession.

FIGURE 5.4

Non-resort 2010-2015

Source	SS	df	MS	Number of obs	=	1,680
				F(9, 1670)	=	51.20
Model	2.6931e+12	9	2.9923e+11	Prob > F	=	0.0000
Residual	9.7593e+12	1,670	5.8439e+09	R-squared	=	0.2163
				Adj R-squared	=	0.2120
Total	1.2452e+13	1,679	7.4166e+09	Root MSE	=	76445

medhomevalue	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
unemprate	-1883.972	193.6769	-9.73	0.000	-2263.847	-1504.097
pctinpov	-1370.891	197.8059	-6.93	0.000	-1758.864	-982.917
medage	112.8421	440.2358	0.26	0.798	-750.6299	976.3142
avghhsize	-34971.98	8268.3	-4.23	0.000	-51189.3	-18754.66
medincome	1.385253	.1157334	11.97	0.000	1.158255	1.612251
popdensity	.9890344	.608131	1.63	0.104	-.2037449	2.181814
propvacahu	-61432.28	25569.86	-2.40	0.016	-111584.6	-11279.92
propownedhu	-33523.8	13672.41	-2.45	0.014	-60340.66	-6706.929
propwhite	-53752.18	14424.24	-3.73	0.000	-82043.67	-25460.7
_cons	277670.4	35414.97	7.84	0.000	208208	347132.8

Resort 2010-2015

Source	SS	df	MS	Number of obs	=	797
				F(9, 787)	=	21.82
Model	2.1033e+13	9	2.3370e+12	Prob > F	=	0.0000
Residual	8.4294e+13	787	1.0711e+11	R-squared	=	0.1997
				Adj R-squared	=	0.1905
Total	1.0533e+14	796	1.3232e+11	Root MSE	=	3.3e+05

medhomevalue	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
unemprate	-3607.61	1641.672	-2.20	0.028	-6830.183	-385.0368
pctinpov	-6349.287	2060.675	-3.08	0.002	-10394.36	-2304.217
medage	11329.96	3112.08	3.64	0.000	5221	17438.92
avghhsize	129325.3	55017.94	2.35	0.019	21326.04	237324.6
medincome	2.898987	.56213	5.16	0.000	1.795535	4.002438
popdensity	-12.34544	7.277219	-1.70	0.090	-26.63049	1.939619
propvacahu	-483071.9	66647.33	-7.25	0.000	-613899.4	-352244.3
propownedhu	-978904.6	133618	-7.33	0.000	-1241195	-716614.7
propwhite	464738.5	91629.11	5.07	0.000	284872.1	644604.9
_cons	-349861.2	220301.9	-1.59	0.113	-782309.9	82587.61

Source: Author's calculations

The values for 2015 are mainly projections because this study began during 2015. However, no macroeconomic events occurred during 2015, so the projections should be accurate. These two models cover a long time period that ranges from immediately post-recession to a fully recovered macro economy. For that reason, the R-squared values for

the two 2010-2015 models are lower than the other four models: 0.22 for the non-resort model and 0.19 for the resort model.

The insignificant variables for the non-resort model are: *medage* and *popdensity*. The only insignificant variable for the resort model is *popdensity*. Median age may be insignificant during this time period because older people may have been more affected by the recession in non-resort areas than young people. For example, older people who owned their homes may have had to relocate to lower-value homes or start renting, unlike young people, who may have been renting all along. Older people's savings may have been more affected than the savings young people, as young people likely have fewer assets. Population density is insignificant for the same reasons stated for FIGURE 5.2 and FIGURE 5.3.

The 2010 through 2015 time period describes economic recovery and how economic recovery differs between non-resort and resort communities. During this time period, the gap in coefficients for *medincome* between non-resorts and resorts decreases. The coefficient for non-resorts is 1.38, and the coefficient for resorts is 2.89. This infers that the recession caused a decrease in buying power for every additional dollar beyond median income for both non-resorts and resorts.

As in the previous time periods' models, a negative coefficient is associated with *propwhite* for non-resorts—an unexpected occurrence, as no theories exist to explain this trend. However, the coefficient for *propwhite* for resorts is higher than in any other model: from 189,771 for pre-recession to 154,057 during the recession to 464,728 post-recession. This, which again has to do with the resort industry, is likely because of quickly rising post-recession home prices and a growing service industry.

FIGURE 5.4 is the only model in which *avghhsize* has a positive coefficient for the resort model. For the previous time periods, the negative coefficient was explained by the possibility of decreasing neighborhood value from squeezing extra people into a housing unit. However, during this time period, an increased household size is correlated to increased home values. This could be due to coincidence, where home values are generally increasing at the same time that a small percentage of households increase in size or more families move to these resort communities. However, between the years 2010 to 2015, the average household size decreases from 2.38 to 2.24 people. This coefficient is likely not particularly descriptive of housing trends in resort communities during this time period because the data set is small enough that only a few household-level changes during this time period can affect the coefficients.

Explanatory visual aids

The six models in this study group data into time periods, which can certainly result in inconsistencies in the regressions. However, it is also difficult to group all of the data into a single time period and regress the data at once—despite major macroeconomic changes. A solution to this bias is to graph variables over the time period 2000-2015 and analyze trends visually, while still separating non-resort and resort communities. One interesting metric is the "affordable home calculation," which is defined as three times a household's annual income. In the following graphs, median home value is graphed on the same scale, as well as the affordable home price (three times median household income), between the years 2001 and 2015. In both graphs (FIGURE 5.5 and FIGURE 5.51), the time period of the Great Recession is very distinct.

FIGURE 5.5

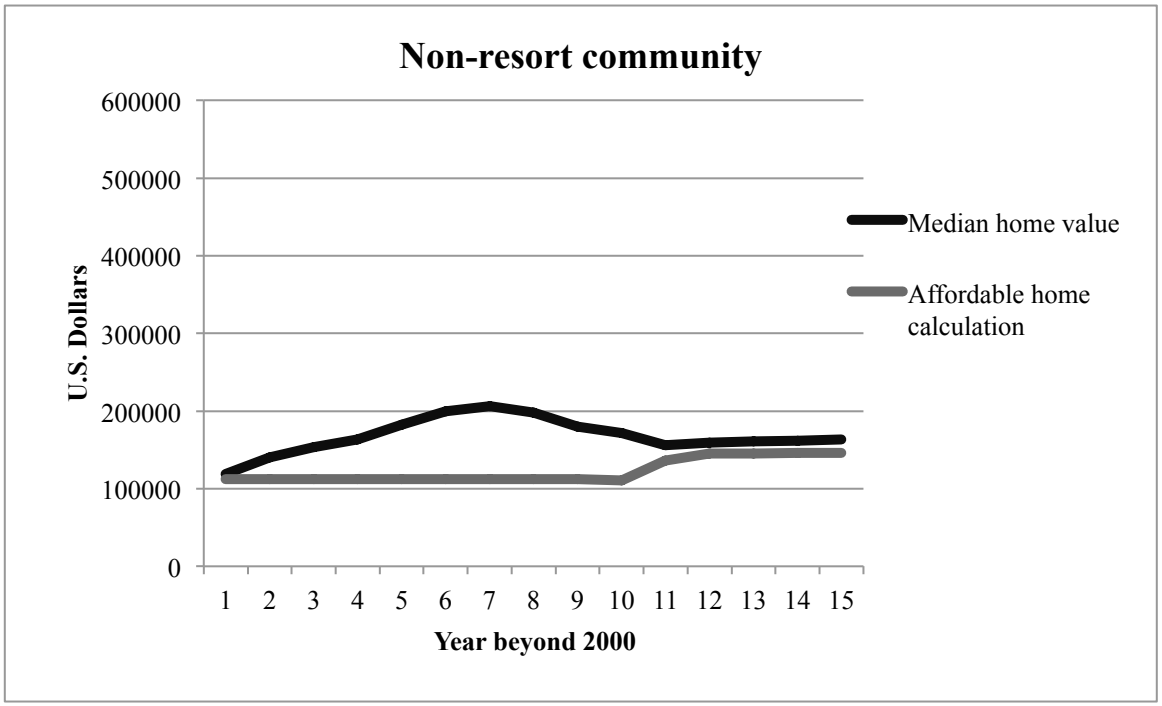


FIGURE 5.51

Using the affordable home calculation, it is apparent that homeowners in neither non-resort communities nor resort communities live in areas where median home values reflect median household incomes. For both non-resort communities and resort communities, income remained almost stagnant between the years 2001 and 2010 (which is why the affordable home calculation remains almost equal between those years). It is also clear that the gap between the affordable home calculation and actual median home values grew—in both cases—between 2001 and the beginning of the Great Recession (around 2007). The gap between median home value and the affordable home calculation closes beginning in 2007 through 2015. This representation does not mean that the average household in these communities owns a technically unaffordable housing unit. Of course, some of the pre-recession gap can be attributed to unaffordable mortgages so common during this time period. However, this is not the only factor. First, this graph does not consider the number of households that rent instead of buy; clearly, the gap for resort communities is larger than the gap for non-resort communities, but only around 40% of resort households own homes, opposed to 55% of non-resort households. The *propownedhu* explains some of this variance. Another factor contributing to this gap is that the graph considers current home values—not sales prices. Housing units could have been affordably purchased in the past and appreciated at a greater rate than the growth of the household's income. The affordable home calculation can be useful in predicting future macroeconomic threats; a gap between the average affordable level and median home values does mean, on some level, that housing units are unaffordable to a portion of the local population.

In reference to only the median home values for FIGURE 5.5 and FIGURE 5.51, these two values—which are the dependent variable in this study—follow a similar trend for both non-resort communities and resort communities. In both cases, since 2011, median home values have been steadily rising; this rise is occurring at an average annual rate of .78% for non-resort communities and an average annual rate of .80% for resort communities. Further, 2011 median home values for each type of community did not dip below the 2001 median home values, which represents the lowest median home value during this time period.

The following chart illustrates peak and trough median home values during this time period. The data for FIGURE 5.6 came from the data set for this study, but the figures have been converted to 2015 prices in order to control for inflation according to the Consumer Price Index for All Urban Consumers (Federal Reserve Bank of St. Louis).

FIGURE 5.6

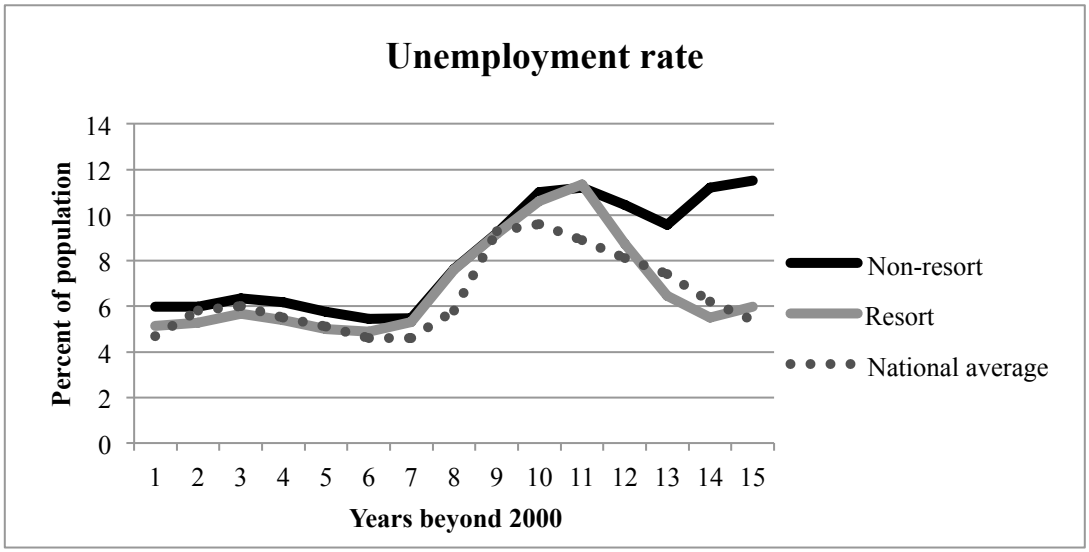
medhomevalue	2001	2007	2011	2015
Non-resorts	$158,828	$236,844	$165,311	$163,244
Resorts	$380,653	$572,350	$385,635	$373,931

This chart demonstrates that even in 2011, the worst part of the Great Recession in terms of home values, home values were not at an all-time low. Further, the most recently recorded home values have not yet recovered to the all-time high values of 2007. In fact, for both non-resorts and resorts, 2015 home values are lower than they were in 2011.

A frequently used metric in analyzing the health of an economy is unemployment rate. FIGURE 5.7 uses averages from the *unemprate* variable of the data set as well as U.S. national averages (taken from the Bureau of Labor Statistics) to compare trends

between the three groups. Although minimal, the data for the non-resort and resort data is incorporated into the data for the national average, so some data is counted twice.

FIGURE 5.7

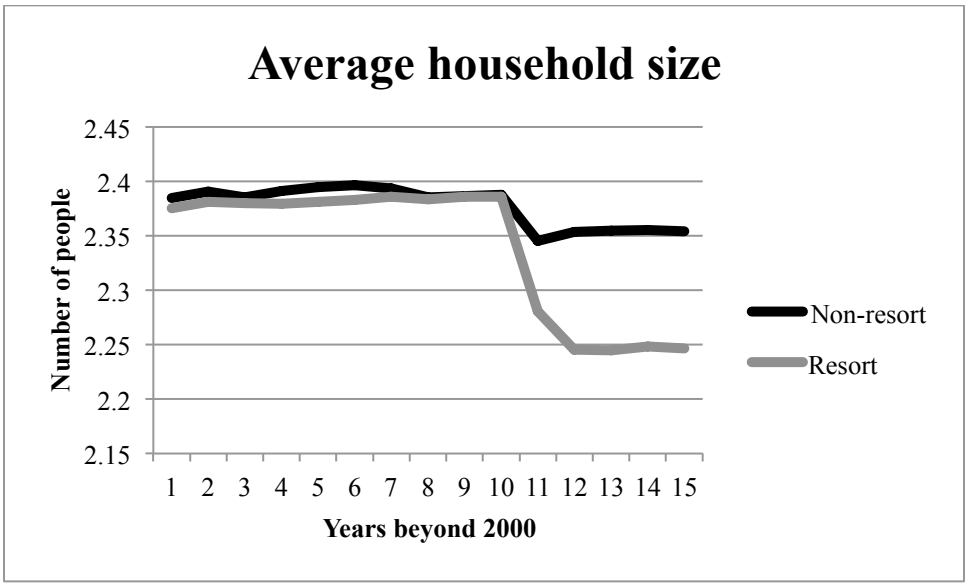


As shown in FIGURE 5.6, all three data groups—non-resort, resort, and the national average—follow both similar trends and unemployment rates from 2001 until the start of the Great Recession. Upon the beginning of the recession (around 2007), the unemployment rate increases across all groups, but it takes several more years for the small communities' (non-resorts and resorts) unemployment rate to fall than it takes the national average. In fact, aside from a short decline between the years 2010 and 2013, rural non-resort towns' average unemployment rate is at an all-time high in 2015 at 11.5%. Resort towns' 2015 unemployment rate is 5.97%, while the national average is 5.5%.

The next visual aid will graph the independent variable *avghhsize* for both non-resorts and resorts over the years 2001 through 2015, pictured in FIGURE 5.8. In the

models, the significant coefficients for *avghhsize* for both non-resorts and resorts are both negative and positive.

FIGURE 5.8



The affect of household size on home value is difficult to explain—especially in this particular study—because vacation homes (which are second homes so household size is not reported to the U.S. Census) skew the data. For example, a two-bedroom condo worth $1 million could have a household size of 3, but a vacation home worth $5 million could have a reported household size of 0. For this reason, looking at this variable over time is more descriptive than regressing it. While the average household sizes for non-resorts and resorts are significantly different from each other, this difference is too minimal to analyze. Between 2001 and 2010, the average household sizes of the two groups are almost identical. Between 2010 and 2015, the average household size in resort communities drops from 2.38 to 2.24. This decrease could be due to families affected by

the recession relocating to other areas. The average household size of the entire U.S. is 2.6 people per household (U.S. Census).

Using visual aids such as the graphs in this section are very revealing in telling a story different than the story told by the regression data. Although the same data set is used for the regressions and the graphs, the data can be interpreted in a less speculative way: by using median home value as the descriptive variable rather than a dependent variable. Through this type of analysis—as well as regression analysis—an understanding of the data can be achieved.

VI. CONCLUSIONS

This study looks at pre-recession, during recession, and post-recession trends in home values and other independent variables in both ski resort communities and non-ski resort communities. The data was separated into these three distinct time periods and analyzed using econometric regressions. The data was also interpreted through visual aids and other metrics (such as the affordable home price calculation). These methods of analysis tell the full story of the data in this study.

During the pre-recession time period (2000-2006), non-resort communities and ski resort communities follow similar trends. While the two types of communities react differently to unemployment (likely because resorts are highly dependent on service industry employment) and to the proportion of Hispanics (likely because service industries employ many minority workers), all other independent variables affect median home prices in the same way. The coefficients in the resort regression model are larger than those in the non-resort model. However, this does not mean that resort economies are more volatile than non-resort economies; these coefficients are larger because the median home price in resort communities is significantly higher than in non-resort communities. In terms of the affect of the independent variables on median home values in a healthy pre-recession economy, non-resort and ski resort communities are very similar.

The following time period (2007-2009) includes the Great Recession in the U.S. It is expected that this time period would show observable differences between non-resort and ski resort communities. Between the pre-recession time period regressions and the regression time period regressions for the non-resort communities, the coefficients for the

significant independent variables increase in magnitude (either more positive or more negative). The opposite is true for the resort regressions; between those time periods for the ski resort communities, the coefficients decrease in magnitude. This means that during a recession, home values in non-resort communities are less stable than home values in resort communities. This does not necessarily mean that home values in non-resort communities were more negatively affected than home values in resort communities; between 2007 and 2011, home values (inflation-adjusted to 2015 dollars) in non-resort communities dropped 30.2% compared to a decrease of 32.6% for resort communities.

The final time period characterizes post-recession (2010-2015). This time period is necessary in determining how non-resort and resort communities recover from economic recession. This study has already identified that home values in these communities have not yet reached pre-recession values, so this time period does not demonstrate year-to-year economic recovery. Between 2011 and 2015, home values (adjusted again to 2015 dollars) in non-resort communities decreased an additional 1.2% and home values in resort communities decreased another 2.5%. While the homes in these communities continued to lose value through 2015, the homes in the rest of the United States on average started to recover their value beginning in 2011. This could indicate a lag in recessionary economic effects on small communities.

In the post-recession time period, the coefficients in the non-resort regression become smaller in magnitude for every significant independent variable (except unemployment rate and percent poverty) than for the pre-recession and recession time periods. This comparison looks at the same magnitude of the coefficient for the same

variable over time. These smaller magnitudes mean that in 2010-2015, most of the variables have a smaller impact on median home values than they had in the past. A different trend can be observed for resorts during this time period. The coefficients in the post-recession resort regression are greater in magnitude for every significant independent variable (except unemployment rate and median income) than for the pre-recession and recession time periods. This means that in 2010-2015, most of the variables have a greater impact on median home values than these same variables had in previous time periods (both positively and negatively). Therefore, home values in resort towns—despite beginning to increase in value—are highly affected by and vulnerable to changes in these independent variables.

The variables in this study that have the greatest impact on median home value (based on the coefficients) are apparent through this study. For non-resort communities, the variables that affect median home values the most are average household size, proportion of vacation homes, proportion of owned (not rented) homes, and the proportion of white non-Hispanics. Non-resort home values are likely heavily affected by household size because in traditional, non-vacation homes, the number of bedrooms (which correlates to square footage) likely has an association with the size of the household. In resort communities, this likely has less of an association because vacation homes (which make up a large number of housing units) do not necessarily correlate size/value with household size.

For resort communities, the variables that affect median home values the most are unemployment rate, proportion of vacation homes, proportion of owned homes, and the

proportion of white non-Hispanics. Resort communities are likely affected heavily by unemployment rate because of the local reliance on the service industry.

This study confirms the dependency of resort towns on the service industry and the dramatic effects of economic recession on the small towns (both non-resort and resort) used for the data. While the two types of small town economies are affected differently by the independent variables used in this study—and while the variables have different effects during different time periods—neither non-resort communities nor resort communities are recession-proof. In this particular study, resort communities were more adversely affected than non-resorts in terms of median home values, and neither have made a full recovery, according to 2015 data. These communities have also been slower than the rest of the United States to recover in terms of median home values.

These results are important for anyone invested in or thinking to invest in some aspect of a ski resort economy—whether that is real estate, the rental market, a business (especially those are heavily service-oriented), or even the ski resort itself. While this study does not propose an answer to the apparent lack of housing in ski resort communities, it does confirm that this issue remains a serious concern. Although home values have not recovered at the point of this study, it can be projected through this data that home values will continue to increase. This will cause a further lack of housing for service industry workers, which is threatening, considering the proven dependence on this type of employment. Therefore, these results can also be useful for towns creating or expanding employee (subsidized) housing.

Further research and studies

This study was completed only four years after the official end of the Great Recession in the U.S. At this point, home values (the dependent variable in this study) have not yet recovered to pre-recession values. For this reason, it is difficult to determine how non-resort communities and resort communities recover from economic recession. A study carried out in the future would be able to further analyze economic recovery in these small communities, which would help to prepare these communities for any future economic downturn.

When considering ski resort economies, it is important to consider climate change as a factor. This issue is a direct threat to ski resorts, with some resorts not receiving enough snow to fully open in recent seasons. This has particularly affected the ski resorts in Lake Tahoe, California, which are included in this particular study (Schiavenza, 2015). Further studies could control for macroeconomic changes and instead look at average snowfall per season compared to ski resort revenue as well as other related variables.

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