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# Short-Term Rentals and its Impact on Housing Attainability and Availability in Branson, Missouri, and Fayetteville, Arkansas

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# Short-Term Rentals and its Impact on Housing Attainability and Availability in Branson, Missouri, and Fayetteville, Arkansas

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## I. Abstract

Recent research in the short-term rental (STR) industry shows a positive relationship between the expansion of usage of home-sharing platforms and the cost of housing, as well as an inverse relationship between STR expansion and the availability of long-term housing units. In these studies, as short-term rental units increase, housing costs tend to go up, and long-term housing unit availability tends to decrease by a measurable amount. As the utilization of STRs can be a valuable source of income for citizens and assist with increasing housing prices and the cost of living, leaders, and researchers are also concerned about their impacts on housing prices and availability. While this paper does not aim to judge whether STRs are a suitable form of hospitality lodging for cities, it does aim to understand the industry's relationship with housing availability and attainability and to guide community leaders and policymakers for the future implementation of regulations in their individual cities, using Branson, Missouri, and Fayetteville, Arkansas, as models.

## II. Introduction

The sharing economy is an internet-based industry that has grown rapidly in recent years and provided new avenues for economic growth. This industry is characterized by a variety of silicon-valley-based companies that use the Internet as their primary interface for service (Bivens, 2019). Short-term rental (STR) companies like Airbnb and VRBO make profits by charging guests and hosts using their platforms to find non-traditional vacation accommodations. While VRBO comes in a close second, Airbnb's rapid growth and over 6 million units worldwide have made it a target for much of the research on STRs and their impact on housing prices. (Airbnb, 2023). Airbnb is an intermediary between consumers and hosts, allowing individuals to "list, discover, and book" (Airbnb, 2023). While this industry has added benefits and convenience for many lives worldwide, some sharing economies have also negatively impacted residential areas. The main concern among many policymakers and social scientists is that STR concentration negatively impacts housing availability and increases home prices.

This paper attempts to analyze the connection between STRs on housing availability and pricing by reviewing the existing research on STRs and through a correlation table and regression analysis of factors affecting housing in Branson, Missouri, and Fayetteville, Arkansas. These two cities are used as case studies to add to the literature on STRs in primarily large, highly populated cities.

The following section highlights existing research on the relationship between STRs and housing. Then, Branson, Missouri, and Fayetteville, Arkansas's unique demographic features and touristic situations are overviewed. Following is a description of the methods used to estimate the impact of short-term rentals on housing availability and relative cost in these geographical regions. Results are then presented. Finally, a conclusion is offered with thoughts

on the presented results and the implications that these results mean for the future of the STR industry and affordable housing.

## III. Literature Review

Since Airbnb's founding in 2008, its rapid growth has brought up a myriad of issues surrounding increasing home prices, issues with taxing and regulating the company, and their impact on the communities around them. While many champion the site, quoting increased home values, supplemental income, and improved neighborhood beautification, others are more concerned about its impact on housing and rental rates (Sheppard & Udell, 2018). These concerns have led some cities like Barcelona and Berlin to enact bans or partial bans on STRs and have led to a rise in smaller cities implementing regulations, special taxes, and other ways to try and mitigate any potentially harmful effects this industry may have. Smaller cities that have popular tourist destinations or natural features, like Alamosa, CO, have started implementing rules such as buffer zone limits between STRS, spacing the units out and limiting the possible number of STRs in one area, or by limiting the number of business licenses allowed at a given time (Osborn, 2021). In the summer of 2023, Dallas, TX, attempted to ban STRs from operating within single-family neighborhoods, banning 90% of rentals and punitively regulating the few that may remain. However, in December of 2023, a judge blocked the regulations, stating that the regulation violated the State's constitution (Kera News, 2023).

### *Climbing Costs and Investor Market Share*

In May of 2022, the number of short-term rentals in the U.S. market reached an all-time high, with demand for rentals expected to increase by more than 20% in the upcoming year (AIRDNA, 2022). In 2019, 67.9% of these listings were classified as entire homes or apartments available for short-term rent (CBRE Research Study, 2020). At the same time, according to the

National Low-Income Housing Coalition, there is a shortage of more than seven million affordable housing units.

According to Harvard's *State of Housing 2022*, owner-occupied and rental housing costs continue to climb, with almost a 20% increase from 2021-2022. 67 of the top 100 housing markets have experienced record-high appreciation rates over the past year. Additionally, the rate of investor-owned single-family homes sold in the first quarter of 2022 reached 28 percent, well above the average share of 16 percent from 2017-2019, with some cities, like Atlanta, reaching 41 percent of investor share of sales. There is also no literature reviewed that suggests adding STR units to the market has spurred an increase in residential construction, meaning that as more units are turned into STR listings, fewer housing units are available to long-term renters and owner-occupied homes. However, it is also possible that while STRs have exploded globally, the share of STRs compared to the long-term market is still much smaller and does not have as much impact as people assume.

Additionally, owner-occupied Airbnbs never leave the long-term share, as these Airbnb hosts rent a room or offer space when they go out of town. Barron et al. found that zip codes with fewer owner-occupied Airbnb units see larger allocations of long-term to short-term rental units (2020). Additionally, many Airbnbs were previously single-family vacation homes, meaning they were never a part of the long-term housing stock before finding their way onto Airbnb's platform. However, in some cities, where tourism is one of the main facets of the economy, the appeal of turning long-term rental units into short-term is growing. Barron et al. also found that owners were likelier to allocate long-term rentals to short-term in more touristy zip codes (2020). Additionally, as Airbnb surges in popularity, the share of owner-occupied units to non-owner

occupied is changing, creating a potential for an increase in long-term and short-term rental allocations.

In cities all over the U.S., rent and home prices, especially for college students, have increased rapidly. For example, in Fayetteville, AR, the average individual rent rates were $500 a month in the 2020-2021 leasing period, and now, for the 2023-24 leasing period, the average rate for a spot in a four-bedroom unit is $800 a month, resulting in an almost 60% increase in rents of student housing over three years (Zumper, 2023). While various factors are contributing to this issue, such as post-COVID inflation and increased travel, short-term rentals have added to the pressure on cities to find adequate housing for those who live there. As populations begin to rise and new demographic groups are joining the housing market at an increasing rate, housing is becoming a more significant issue than in pre-pandemic years (Harvard, 2022). To mitigate the effects of STRs on housing, it is necessary to gather data on how this industry affects cities so that they may make informed decisions on how to regulate the industry.

*Legality Issues*

New York City has been the topic of many studies on housing affordability and STRs and has raised many concerns about the legality of its operations over the years. In 2014, Attorney General Eric Schneiderman found that 72% of Airbnb's listings in New York City violated use and safety laws and were, therefore, illegal (Udell, 2018). The sheer number of units found also raised concerns about the impact of STRs on the available housing stock in NYC, which was already under what was needed.

*Are STRs Driving up Home Prices?*

Over the past few years, various research studies have reached a consensus in their hypotheses' that there is a positive relationship between the number of STRs on the market and

rental price and an inverse relationship between the number of STRs on the market and rental availability. A 2016 research study from the University of Massachusetts hypothesizes that increasing STRs in Boston, Massachusetts, drive up rent prices. In this study, the authors found a positive relationship between the number of STRs and rental prices. Their analysis "supports the contention that home-sharing increases rents by decreasing the supply of units available to potential residents" (Merante & Horn). This data is consistent with findings from Barron et al., who found that at the median owner-occupancy rate zip code, a 1% increase in Airbnb listings leads to a 0.018% increase in rents and a 0.026% increase in house prices. With the median annual Airbnb growth in each zip code, those results translated to an annual increase of $9 in monthly rent and $1,800 in house prices for the median zip code in their data, which accounts for about one-fifth of actual rent growth and one-seventh of price growth (2020).

A study from the Economic Policy Institute (EPI) in 2019 also found data to support their hypothesis that the economic and social costs of Airbnb expansion can potentially outweigh any benefits (Bivens, 2019). This study found that housing prices are rising much faster than the price of short-term accommodations and overall consumer goods prices. The EPI stresses that even small housing prices can increase hardships for American families because housing cannot be foregone when prices rise too much. Bivens validated this stance by quoting similar studies examining the effect of Airbnb's introduction on housing costs, including a study that found STRs have raised average rents in New York City by nearly $400 annually (2019).

Sheppard and Udell take a slightly different approach when analyzing the impact of Airbnb in New York City. They look at the puzzle of two opposing viewpoints:

> Suppose short-term rentals provided via Airbnb create a concentration of what are actively unsafe hotels or upsetting quiet residential neighborhoods. In that case, they will

generate a local concentration of externalities that might be expected to depress property values rather than make housing less affordable. Alternatively, if negative externalities are modest relative to the impacts of space diverted from providing housing for residents to providing short-term accommodation for visitors, then the local concentration of Airbnb properties may increase house prices (2018).

Ultimately, they found that adding the capitalization aspect of Airbnb to a simple monocentric model accounts for how Airbnb activity might impact housing prices. They found that houses closer to the commercial center receive a higher treatment effect. Properties sold within 300 meters of 1 to 5 Airbnb properties sell for about 16% more, while those exposed to 31 or more properties sell for a 77% premium. However, when exposed to the same number of Airbnb units, the farther away from the commercial center, the less effect those units have on prices. They conclude that proximity to an Airbnb ultimately outweighs any "depressive" features, such as noise and high traffic of non-residents, by consistently increasing home values.

Figure 1

*Estimated Effect of Different Treatment Levels, Sheppard and Udell, 2018*

| # Airbnb | All Distances | Less than 7km | 7km to 11.5km | 11.5km to 17km | More than 17km |
|---|---|---|---|---|---|
| 1 to 5 | 0.1596*** | 0.1413*** | 0.1653*** | 0.0855*** | 0.0354 *** |
| σ | 0.004 | 0.010 | 0.006 | 0.007 | 0.011 |
| 6 to 10 | 0.4553*** | 0.5838*** | 0.3371*** | 0.2202*** | -0.0522 |
| σ | 0.012 | 0.010 | 0.012 | 0.046 | 0.125 |
| 11 to 15 | 0.5399*** | 0.6486*** | 0.4228*** | -0.1171 | |
| σ | 0.030 | 0.012 | 0.019 | 0.194 | |
| 16 to 20 | 0.6636*** | 0.6712*** | 0.4999*** | 0.4179* | |
| σ | 0.035 | 0.014 | 0.023 | 0.241 | |
| 21 to 25 | 0.6403*** | 0.6699*** | 0.5361*** | -0.0761 | |
| σ | 0.037 | 0.015 | 0.027 | 0.237 | |
| 26 to 30 | 0.6436*** | 0.6499*** | 0.5379*** | -0.3063 | |
| σ | 0.043 | 0.019 | 0.034 | 0.365 | |
| 31 or more | 0.7748*** | 0.7934*** | 0.5903*** | -0.0325 | |
| σ | 0.018 | 0.007 | 0.016 | 0.173 | |

**** - significant at 1 percent, * - significant at 10 percent*

*Possible Economic Benefits of Short-Term Rentals*

One of the platform's most significant benefits is that it allows homeowners to produce an additional income stream to which they might not otherwise have access. Renting in the short term rather than the long term through Airbnb lowers transaction costs and is generally more lucrative (Bivens, 2019). Additionally, homeowners could live in the unit part-time and rent it out while traveling or between homes, thus providing additional funds. While this seems to benefit mainly homeowners and not renters, the recent introduction of a new rental-sharing program through Airbnb, introduced in November of 2022, comes with various positive benefits for renters. This new program works with Airbnb-friendly landlords to allow renters to list their homes on Airbnb part-time. The landlords will receive a small portion of the money earned through Airbnb, and renters will now be free to rent their apartments while they are out of town or have an extra room. This new program allows renters to generate additional income while not causing a housing shortage by converting long-term units to short-term (Airbnb, 2022). While VRBO has not announced a similar program yet, I anticipate this move will also spread to other home-sharing platforms. However, the need for this service is a part of the more significant issue of home and rent prices outpacing wages and increasing rapidly, pricing out many long-term residents.

*Wealth Disparity*

Wealth from STRs and non-owner-occupied housing is concentrated primarily in white and wealthy households, meaning the benefits described above are not widespread for the general population. Housing wealth is already concentrated among white and high-income households, but the concentration in non-owner-occupied housing is even higher, as the top 20 percent of earners hold 90.1 percent of housing wealth. (See Figure 3) (Bivens, 2019). Additionally, in the United States, white homeowners hold 86 percent of nonprimary housing wealth, black homeowners hold 5 percent, Hispanic homeowners hold 3.6 percent, and other races and ethnicities hold 5.2 percent.

Figure 1

*Bivens, 2019*

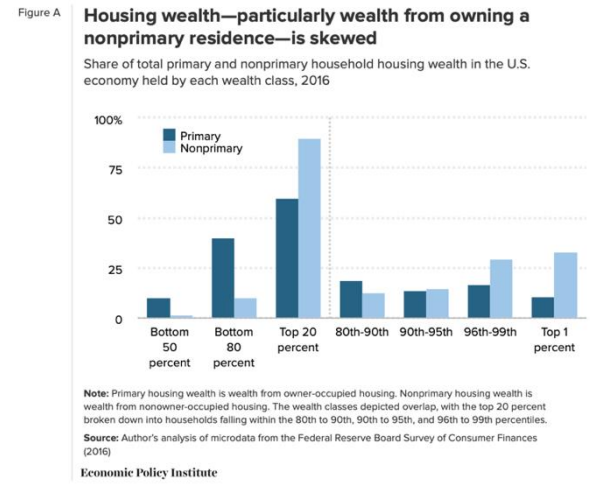
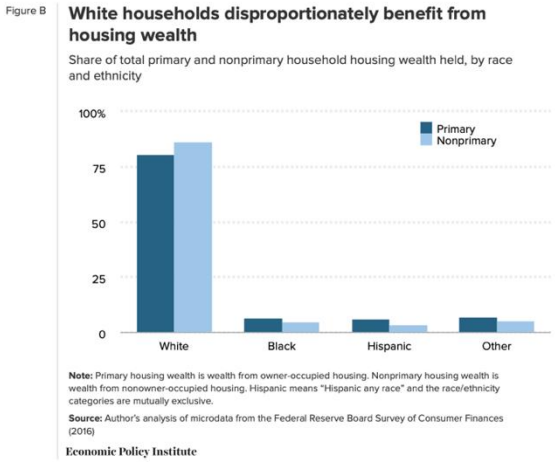



Figure 2

*Bivens, 2019*




*Gentrification or Revitalization?*

Implementing short-term rentals into declining neighborhoods in St. Louis, Detroit, Niagara Falls, and other declining cities can also help save historic homes and assist homeowners and neighbors in obtaining loans to renovate and earn higher appraisals. A *Strong Towns* article from 2022 wrote that when neighborhoods decline and have increasing vacancies, they are not contributing to the health or economic vitality of the city (Strong Town, 2022). However, renovating historic homes can be expensive, and lenders often do not approve loans in

neighborhoods with low home values. One homeowner decided to remodel a historic home in Niagara Falls and used Airbnb to cover the high costs of renovating the home. The owner rented one side of the duplex as a long-term rental and the other as an STR. Through Airbnb, they could bring in an additional $500-$800 a month and prove enough income to get a loan from the bank to invest in the roof, exterior paint, and sewer. While this is just one story, it exemplifies how short-term rentals can breathe new life and attract new tourists to homes slated for demolition and towns slowly fading away.

Some praise Airbnb for creating economic growth through increased tourism and job generation. The NERA Economic Consulting firm claimed that Airbnb "supported" 730,000 jobs and $61 billion in output globally, but Bivens refutes this statement, claiming that this money would have been accounted for and spent at alternative accommodations if Airbnb did not exist (2019). The problem with the NERA study is that the study assumed that if Airbnb did not exist, all the guests who used the platform would not have visited or booked a vacation to their chosen destination. However, Guttentag reports that 98 percent of survey respondents identified that they would still book their lodging if Airbnb did not exist, and only two percent of respondents stated they would not have undertaken a trip if Airbnb did not exist (2016). In a study by Morgan Stanley Research, there were nearly identical findings, with two and four percent of survey respondents reporting they would not have undertaken the trip if Airbnb did not exist, thus supporting the idea that NERA overstates Airbnb's economic impact.

Additionally, even with a slight increase in spending associated with a two percent increase in visitors due to Airbnb, hotels are more labor-intensive than Airbnb; thus, expanding Airbnb accommodations and a decline in the hotel industry is likely to support less employment (Bivens, 2019).

*Current regulations on STRs*

Urban residents are afraid of the loss of community that can result in exchange for a revitalization of buildings and gentrification created by short-term rentals. Many are worried that their residential communities will be disrupted by partying and frequent turnover of guests. These concerns have prompted many cities to implement quiet zones in residential neighborhoods or enforce no-party ordinances. Many cities are starting to regulate STRs more intensely, requiring special permits, enforcing zoning codes, and more (City of Fayetteville, 2022). An early report on STRs by Attorney General Eric Schneiderman found that nearly three-quarters of Airbnb hosts violated tax, zoning, and other laws, further harming the community fabric (Judd and Hinze, 2020). However, there are also efforts at the state level in Arkansas to prevent municipalities from "enacting or enforcing an ordinance, resolution, rule, or another requirement of any type that prohibits or limits the use of a property as a short-term rental unit" (SB197, 2023). After being introduced in February of 2023, the bill died in the House committee on May 1, 2023. While the bill has not progressed, it is a prime example of issues local governments could encounter when trying to pass regulations in their cities and the fierce debates about property rights this issue incites.

The hotel industry is a big force behind many of these regulations, including the rejected Proposition F in San Francisco. The proposition was introduced in 2015 and would have limited STRs in the city almost completely, and the major backers, Unite Here, the Hotel Workers Union, raised most of the $482,000 raised for the measure. However, Airbnb raised over eight million in response, highlighting the high stakes for the company if the measure passed. A year later, however, a bill that was considered a compromise was passed that required hosts to register with the city and live in the unit for at least nine months per year. It also levied a 14 percent tax on

each booking. According to the Hill news, The American Hotel and Lodging Association spent more than $1.6 million on lobbying in 2019 and helped introduce a bill into the House that would strip online rental websites of federal protections that for years have given internet platforms legal immunity over content posted by third parties. “The Protecting Local Authority and Neighborhoods Act, introduced by Rep. Ed Case (D-Hawaii) on Friday, would make internet platforms liable when they host advertising for short-term rentals that violate state and city laws” (The Hill, 2019). The bill was not enacted, but similar measures could be introduced in the future (GovTrack.us, 2019).

This paper contributes to the growing body of literature by analyzing the STR and housing climate in two regionally similar but demographically different areas of the United States. The following section highlights the demographic conditions and current state of housing in Branson, Missouri, and Fayetteville, Arkansas, as well as the methodology used to determine the relationship between STRs and housing affordability and availability.

## IV. City Background

### *Branson, Missouri*

Branson, Missouri, playfully named the “Family-friendly Las Vegas of the Midwest,” and the official vacation destination of the Kansas City Chiefs, is full of live music, wacky attractions, and golf courses in the Ozark Mountains. Located in Taney County, Branson attracts close to 8 million visitors annually, but the town is home to only 12,497 residents (United States Census, 2022), 55,854 total in the county (American Community Survey, 2018-2021). Most of these residents make their living by working in the tourism industry, with the largest sector, accommodation and food services, employing 6,605 (34.2%) workers. The next-largest sectors in the region are Retail Trade (3,271 or 16.9% of the workforce) and Arts, Entertainment, and

Recreation (2,413, or 12.5% of the workforce). As of the second quarter of 2023, total employment for Branson, MO, was 19,326, but the actual city's labor force was 6,025 of that 19,326, with a participation rate of 59.8% because employment in Branson pulls heavily from surrounding cities and counties (Taney County Quarterly Economic Overview, 2024). While the COVID-19 pandemic had a significant negative impact on tourism and local business in 2020, Branson saw 2021 levels bouncing back to pre-COVID-19 levels, with 2021 having the largest YoY increase to date with a 10 percent increase over pre-covid 2019 levels (City of Branson Year-End Marketing Report, 2021).

In 2022, the median household income was $50,109.50, up from $40,887 in 2018 (FRED St. Louis, 2024). However, the average wages in the largest employment sector, accommodation and food services, was $33,943 in 2023, with retail, the second highest employment sector, falling just under that average (Taney County Partnership, 2024).

In Branson, approximately 2,500, or 20%, of the population is considered unsheltered or living in extended-stay motels. These motels have been a fixture of Branson's housing options for years; however, more and more are being condemned yearly, displacing those who live there with nowhere to go. In September of 2023, the City of Branson Launched a Lodging and Safety initiative to target unsafe business practices and sanitary conditions that many of the extended stay motels in Branson are characterized by. By early February of 2024, six motels had been shut down, and there is a long list of those who are next in line for violating various safety procedures (City of Branson, 2024). While it is extremely important to ensure safe and equitable living conditions for individuals experiencing poverty or at low-income levels, there is an urgent need to have a plan in place to replace those housing units and find shelter for those who previously inhabited the units or else the growing issue of a lack of attainable housing and poverty in

Branson will continue to grow. There is currently an emergency task force in Branson created by various non-profits and community figures to tackle the issue of sudden closings of motels and to work with the displaced residents to find new housing and resources they may need (Elevate Branson, 2024) Because of confidentiality agreements, the sources of this information and specific plans may not be shared publicly but represent the great need for a new permanent solution for workforce housing.

*Housing in Branson*

One of the most significant issues regarding housing is that Branson has a deficit of 798 units for those making 0.00 to $25,000 per year. Additionally, while there is an adequate supply of housing for those making $25,000-$49,000, these renters and homeowners are competing with those who earn $50,000 and up per year, as there are significant shortages in this category as well (Taney County Partnership, p. 50, 2023). A significant issue with attainable housing everywhere is that those who earn more can buy down, but those who earn less cannot buy up, ensuring that there are missing rungs on the housing ladder in many communities. Furthermore, because construction cannot meet the price points needed, every unit demolished or renovated in Branson is an affordable unit lost (Taney County Housing Study, p. 23, 2023).

In the rental sector, the Taney County Partnership conducted a study of Taney County to determine demand for rental units. Their findings determined Branson's economically low "off-season" (January-February) has an 8% rental vacancy rate with a 2-week turnover for rental units. General practice when developing new rental projects is to base financing off of a 7 to 8% financing rate, so these numbers are relatively not concerning and indicate a high demand for rental units and a shortage of units during peak season (Taney County Housing Study, p. 11, 2023).

At first glance, Branson's housing vacancy rate is extremely high, 32% in 2020, as there are many vacation and seasonal homes in the area. However, the number of vacant units for sale or rent in 2022 was 178 out of the 8,591 total units in Branson (Taney County Housing Study, p. 48, 2023).

*STRs in Branson*

With 8 million visitors annually, the STR business has boomed in Branson. New construction for STRs can be seen in town and the surrounding Stone and Taney counties, dotting the shoreline of Table Rock Lake. According to AIRDNA, there are approximately 5,100 STR active units in Branson, Missouri. According to the Taney County Partnership, since 2019, Branson has added 581 housing units and experienced an increase of over 2,600 short-term rentals. These numbers indicate that Branson experienced a loss of over 2,000 units for permanent residents/employees; however, it is also likely that some of these units can be explained by seasonal owners who listed their existing seasonal housing as STRs.

While the construction of STRS in the area continues to grow, sales of condos branded as potential nightly rentals have recently dropped. According to a Branson Realtor spoken to for this project, the saturation of nightly rentals in the market has almost spilled over in Branson, creating a potential for some of these newly built units to return to the long-term housing stock if the demand for new nightly rentals continues to decrease, and if new owners cannot drive enough traffic to their listings for an STR to be a viable source of income.

Branson does not have very many regulations surrounding STR development and is a place that is heavily marketed as being "business-friendly." However, there are trends toward addressing the STR registration requirements and changes in zoning to protect some areas of the city from STR conversion. Currently, the only regulations require that nightly rentals should not

be allowed within planned developments unless specifically listed as an allowed or permitted use and that single-family homes may not rent out single rooms (City of Branson). With the recent work done by the Taney County Partnership and the attention fixed on addressing extended stay motels, there appears to be a shift toward addressing some of the region's housing needs as Branson's visitor count continues to grow and land becomes more expensive.

*Fayetteville, Arkansas*

Fayetteville, Arkansas, is a city of just under 100,000 people located in a fast-growing metropolitan area of 576,403 people, according to the Northwest Arkansas 2023 State of the Region report. The city has been growing rapidly in recent years, with population projections expected to reach nearly 151,000 people by 2045 and add 1,026 households yearly (Fayetteville Housing Assessment, 2023). Like many cities in the rest of the country, residents are concerned by the skyrocketing housing prices, changes in financial markets leading to high interest rates, and the continuing issues with supply chain and labor shortages leading to higher-than-ever construction costs, as well as the unique fact of a record-breaking enrollment at the University of Arkansas, which had an enrollment total of 32,140 students in 2023 (University of Arkansas Enrollment Services, September 8, 2023.) Of these 32,140 students, 80% live in off-student housing, as the on-campus housing is severely limited and burdened with record enrollments in the last three years. While many are counted in this population estimate, some retain their primary residence in another state and are not counted, adding to the current housing strain (Fayetteville Housing Assessment, 2023).

*Housing in Fayetteville*

As of December 2023, Fayetteville has 51,706 housing units, but half of these households are cost-burdened by rent and mortgage costs (Fayetteville Housing Assessment, 2023). With a median income in Fayetteville of $56,881 in 2022, up from $42,101 in 2018, the median can

barely cover the average rent prices of the new apartments in the area (Data Commons, 2024). Households need to earn at least 120% of the median household income or about $30/hour to afford the average rent of $1,440 on a new two–bedroom apartment. Half of Fayetteville's households earned $25.48 an hour or less in 2022 and would be cost-burdened by housing costs that exceed $1,325 per month, less than the average rent of $1,385 for a new apartment in 2023 (Fayetteville Housing Assessment, 2023).

STRs in Fayetteville

Currently, Fayetteville restricts STRs to two categories: Type 1 and Type 2. Type 1 is a STR where the principal use of the property remains a full-time residence and must be occupied by the owners nine months out of the year. Type 2 is classified as a non-permanent residence and is limited to 475 business licenses to be distributed at any time. The city has currently reached this limit. Additionally, STRs are subject to the City's 2% Hotel/Motel/Restaurant tax (City of Fayetteville, 2024).

## V. Methodology

In this paper, a correlation in Excel was run to test the effect of STRs on housing prices and availability. Variables measured in the correlation were the reported number of STRs in each city, the ZHVI, the number of Total Housing Units, Median Household Income, the Median Number of days that homes are on the Market, the Median List Price, Population, Median Gross Rent Index, Inflation, and the 30-year Mortgage Rate. For Branson, the number of Out-of-Town Visitors was also used as a measure of touristyness. For this study, the City of Fayetteville and its tourism center, Experience Fayetteville, were contacted for that information, but the only information available was numbers of the amount of people that came through Experience Fayetteville for tourist information; thus, this variable was not used. Pearson's correlation table was followed as a measure of the strength of correlation.

A regression in Excel was run as well to test the variables further. Based on previous literature, we anticipate that as STRs increase in the two studied cities, so will rent prices, housing values, and median listing prices. Additionally, as we expect the conversion of housing units to short-term rentals to contribute to a decrease in the existing housing stock, we anticipate the number of Total Housing to be negatively impacted by STRs.

For each city, four regressions were run with four separate hypotheses:

$H_1$ = STRS influence the Zillow Housing Value Index

$H_2$ = STRS influence the Total Number of Housing Units

$H_3$ = STRs influence the Median Rent Index

$H_4$= STRS influence the Median Listing Price

In $H_1$, the dependent variable was the Zillow Housing Value Index, and the independent variables were the number of STRs, Population, 30-year fixed-mortgage rates, and the Total Number of Housing Units.

In $H_2$, the dependent variable was the Total Number of Housing Units, with independent variables the number of STRs, Median Household Income, Population, and the 30-year fixed mortgage rate.

In $H_3$, the dependent variable was the Median Rent Index, and the independent variables were the number of STRs, Population, Total Number of Housing Units, and the 30-year fixed mortgage rate.

In $H_4$, the dependent variable was the Median Listing Price, and the independent variables were the number of STRs, Population, Total Number of Housing Units, and the 30-year fixed Mortgage rate.

The value focused on in this study is the interaction with STRs, but the median household income and population were used as indicators of local demographic and economic conditions. The total housing units were used as indicators of scarcity and supply and demand. The 30-year mortgage rate was used as an indicator of country-wide economic health and buying power.

*Short-Term Rental Data Collection*

The data used for short-term rental listings from 2020 to 2023 in Branson, Missouri, and Fayetteville, Arkansas, was obtained from AIRDNA, an online site that takes data from Airbnb and VRBO to calculate the number of short-term rentals on the market, pricing, and other market tools. On their specific market page for a geographical region, AIRDNA provides data from the past three years, which, in this case, was from 2020-2023. Figure (4) shows the increase in short-term rental listings from 2020-2023 for Fayetteville, Arkansas. Figure (5) shows the increase in short-term rental listings from 2020 to 2023 for Branson, Missouri.

Figure 4

*Fayetteville, AR STR Growth, AIRDNA, 2023*

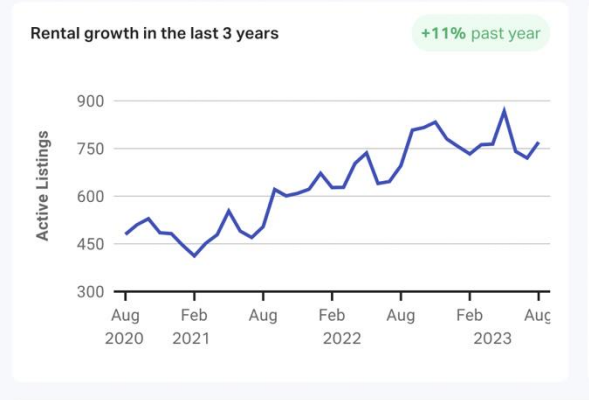
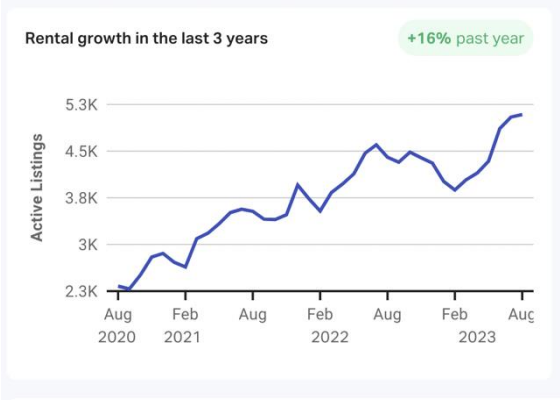



Figure 5

*Branson, MO STR Growth, AIRDNA, 2023*




For both cities, from 2018 to 2019, data on the number of STRs in each area was not available on AIRDNA, so other sources were utilized. For Branson, Missouri, the numbers came from the City of Branson's Licensing Compliance Manager, Matthew Henry, after being contacted for this study. However, Henry stated that the way the STR licensing system has

worked is that a business only needs to obtain one license to operate multiple properties and that there have not been disclosures about how many properties are operating under that one license. Thus, the numbers from 2018 and 2019 are likely vastly underreported. Henry stated that the city is currently working to improve its STR reporting system.

In Fayetteville, Arkansas, data for 2018-2019 was obtained from two sources. For 2018, the 504 listings were obtained from a study for Fayetteville, Arkansas, completed in 2018 (Arnold et al.). The 2019 number was extracted from a city public input meeting on September 30, 2019, where they estimated there were approximately 500 STRs within city limits (City of Fayetteville, 2019).

*Housing Cost Data*

Housing Price data from Fayetteville, Arkansas, and Branson, Missouri, was obtained from the Zillow Home Value Index (ZHVI) (See Figures 6 and 7). The ZHVI is a measure of typical home value and market changes across the given region.

Data on rental prices for Fayetteville, Arkansas, was obtained from the Zillow Observed Rent Index (ZORI). The ZORI is a smoothed measure of the typical observed market rate rent across a region. ZORI is a repeat-rent index weighted to the rental housing stock to ensure representativeness across the entire market, not just those homes currently listed for rent. The index is dollar-denominated by computing the mean of listed rents that fall into the 40th to 60th percentile range for all homes and apartments in each region, which is weighted to reflect the rental housing stock (Zillow, 2024). The “All Homes Metro & U.S. Indexes” was used for the ZHVI and ZORI data sets. The observed period used in this study was 2018 through 2023, and data for each yearly point was taken from June 30, a median point of the year. ZORI data for Branson was unavailable until 2023; thus, the United States Census was used as a data source.

For 2023, an average rental cost was unavailable, so an average of the previous two years was calculated. See Figure 8 for an overview of the changes in rent from 2018 to 2023 in Fayetteville and Branson.

Figure 6

*ZHVI, Fayetteville, AR*

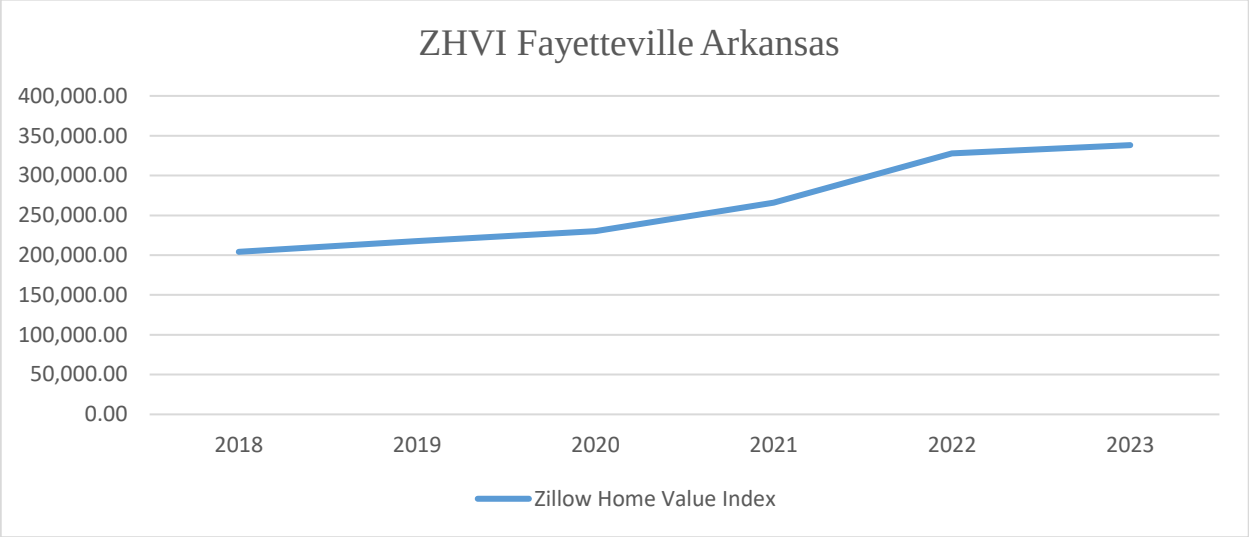



Figure 7

*ZHVI, Branson MO*

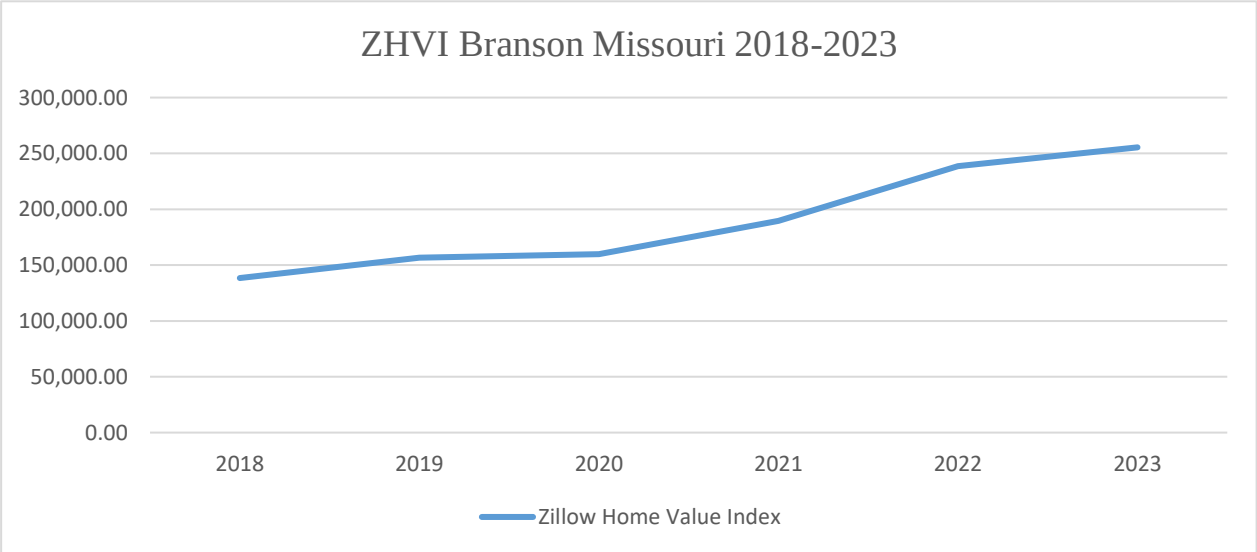
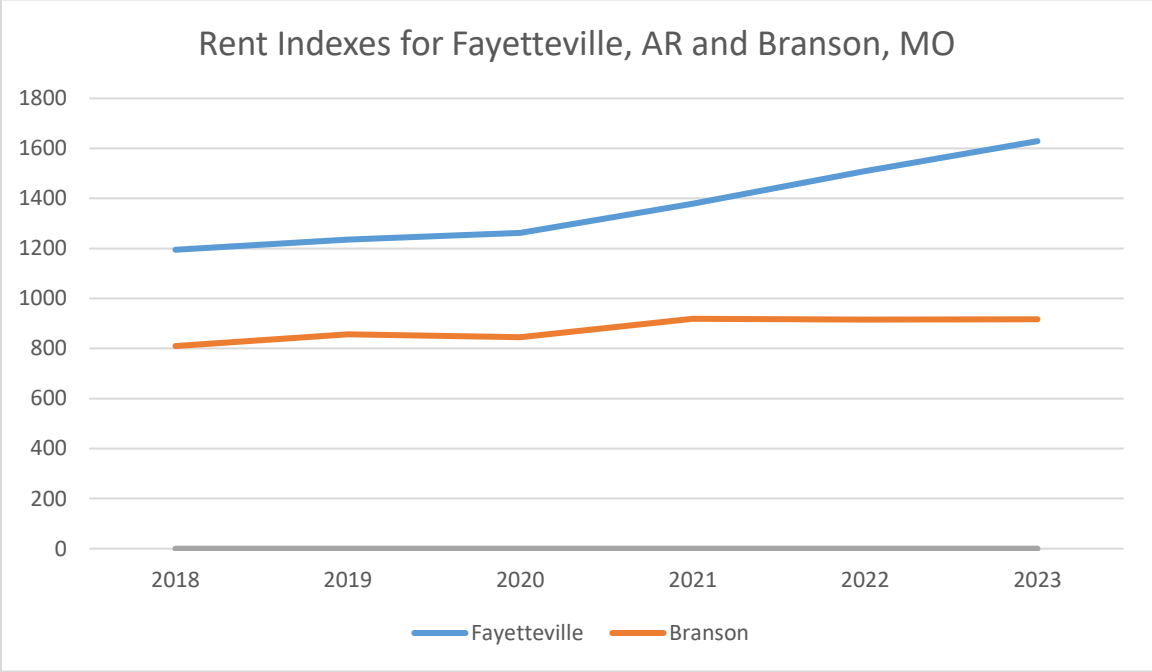


Figure 8

*Rent Indexes for Fayetteville, AR, and Branson, MO*




The number of new housing units for Fayetteville was obtained from the Fayetteville Housing Assessment and an inquiry to the City of Fayetteville's Long-Range Planning/Special Projects Manager, Britin Bostik.

Data on Median Listing prices was obtained from Zillow's Median List Price (Smooth, All Homes, Monthly) under the For-Sale Listings Housing data page. In this data set, data was available for both Branson, Missouri, and Fayetteville, Arkansas. "Market Hotness" was observed for Branson and Fayetteville by collecting the "Median Days on Market" dataset from the Federal Reserve Bank of St. Louis. For Branson, FRED St. Louis had data on Taney County, and for Fayetteville, data was taken from a graph with the cities of Fayetteville, Springdale, and Rogers combined. For the model, the figure from July of each year was extracted.

*Demographic Data*

Data collected on the demographical background used for this model was obtained from the cities of Fayetteville, Arkansas, and Branson, Missouri; the United States Census; CityData.com; Data Commons; the American Community Survey; and the Taney County Partnership.

The population count for Fayetteville, Arkansas, from 2018-2023 was taken from the Data Commons summary of the United States Census and the United States Census Quick Facts page. Population for Branson, Missouri, from years 2018 and 2029 was obtained from Data Commons, and 2020 and 2022 were collected from the U.S. Census Quick Facts Page, 2021 the City of Branson, and 2023 was calculated from an average of the previous five years. For Fayetteville, 2018-2022 were collected from Data Commons, and 2023 was also calculated using an average.

Median Household Income for Branson was derived from the St. Louis Federal Reserve Bank Taney County Graph. As no data was available for 2023, an average of the last two years was taken to avoid disturbing the model. For Fayetteville, median household income was collected from Data Commons, and the same calculations were made to fill the 2023 statistic.

The numbers on Fayetteville, Arkansas, Residents without housing were obtained from the Point in Time count for Homelessness in NWA, conducted by NWA's Continuum of Care. Reports from 2018-2023 were used; however, I would like to acknowledge that due to COVID-19, the Continuum of Care was unable to complete the time in count. Additionally, in 2022, only a Washington County count was completed, not a specific Fayetteville region number.

Branson's annual visitors were collected from the City's 2022 Visitor profile research report, and the number for 2022 was collected from an article by the Springfield Business Journal; as the number was unavailable for 2023, an average of 2018-2023 (excluding 2020

because of COVID-19) was taken. Total visitors per year for Fayetteville could not be collected, so this information was not used. Yearly inflation numbers were collected from the U.S. Inflation calculator.

## VI. Results

*Correlation Analysis*

After running a correlation equation for Branson and Fayetteville in Excel, Tables 3 and 4 were output. In this paper, while mainly focused on the effect of STRs on the Rent Index, Zillow Home Value Index, and Total Housing Units variables, the other variables are also essential indicators and aspects of a city's economic and demographic conditions that affect housing stock and value. Overall, STRs had a strong correlation with most of the variables targeted in the study.

For Fayetteville, Arkansas, STRs were strongly correlated with most of the variables introduced into the correlation (See Table 3). For interpretation, Pearson's Correlation table was followed. In all, four variables had a very strong correlation (Median Listing Price, the ZORI Rent Index, and the ZHVI), two variables showed a moderately strong correlation (Population and Median Household Income), and two variables displayed a weak correlation (Median Days on Market and Residents without Housing). For the Median List Price variable, the coefficient of 0.97 indicates that the STRS and the listing prices of homes in Fayetteville move at a very similar rate and in the same direction. We see the same for the ZORI Rent Index, with a correlation coefficient of 0.93. However, there were also strong correlations between our dependent variable used in the later regression analysis (Median List Price, the ZVHI, Rent Index, and Total Housing Units) and variables such as population, inflation, and median household income. For example, in Fayetteville, the Rent Index was highly correlated with

Median Income (0.91), indicating that as wages rise, so does housing, likely due to the five-year change during the study.

For Branson, there is a very strong positive correlation between STRs and three variables (ZVHI, Median Gross Rent, and the Median List Price). There is a strong inverse correlation between STRs and two variables (Median Days on the Market and Total Housing Units), and a negative relationship was demonstrated. As the number of STRs increases in the population, the number of total housing units and the number of days a home sits on the market trend downwards, and as STRs increase in popularity, there is an observed decrease in the amount of time it takes a unit to sell. A moderate positive correlation for two variables (median household income and inflation) demonstrates that the variables tend to increase at similar rates. Figures 9 and 10 demonstrate the correlated relationship between STRs and rent prices.

Figure 9

*Fayetteville, AR Scatterplot*

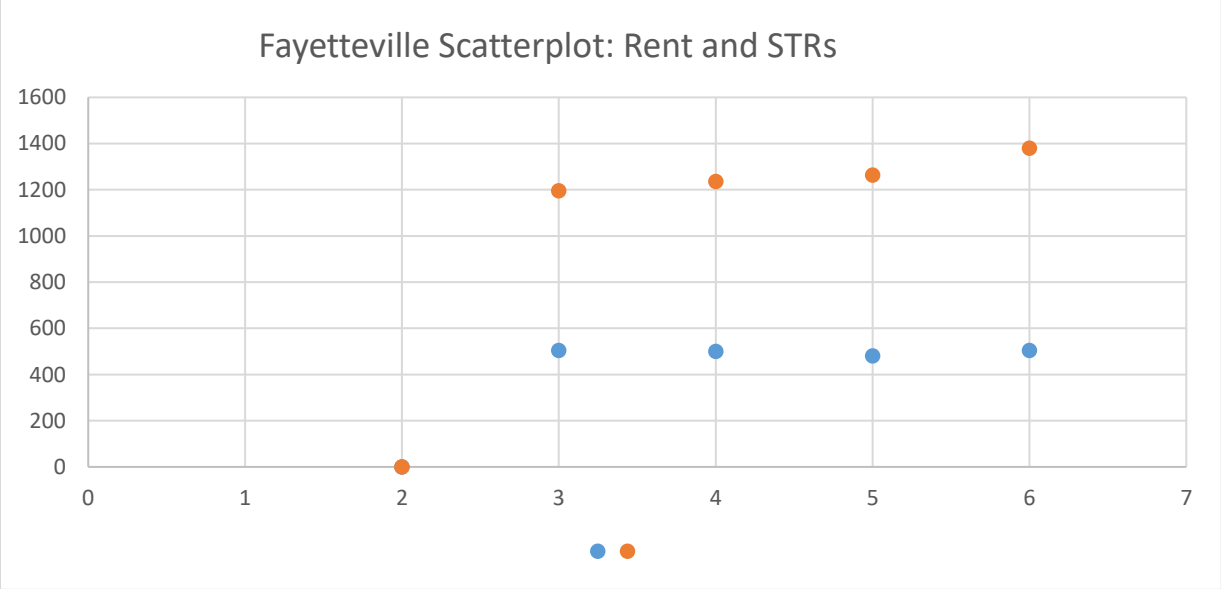
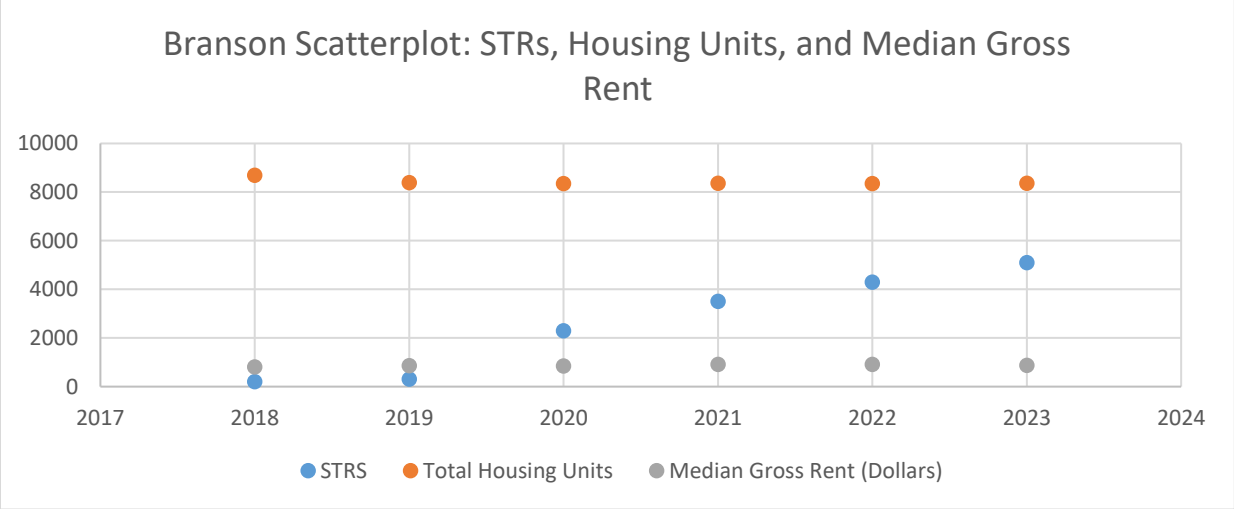


*Figure 10- Branson, MO Scatterplot*




*Regression Analysis*

For each city, four regressions were run to further see the impact that STRs have on housing and rent prices, as well as the availability of units (See tables 5-12). While correlation coefficients can be useful for identifying patterns, in an issue as complicated as housing prices, it is important not to make causal assumptions.

For both cities, the regressions ran on the impact of STRs on Total Housing availability and the ZHVI index were significant. The regressions that were run on the Median Listing Price and Rent Index did not show significance; however, it should be acknowledged that housing value, stock, and rent prices are related to each other.

In Branson, the regression run on the ZHVI index output shows that for every STR unit added to the city, there is a $32.27 increase in the mean of the Zillow Housing Value Index (see Table 5). In a city with over 5000 STR units, that number multiplies extremely quickly.

In the regression ran on Total Housing Units, while statistically significant, the effect of STRS on total housing stock seems to be low, indicating that the construction spurred in Branson by STRS or the existing amount of vacation homes, likely contributed to the lack of an inverse relationship between the two (See Table 6).

In Fayetteville, however, there is a more prevalent inverse relationship between total housing units and STRS. In the regression output, there is an indicated nine-unit decrease in the total long-term housing stock for every positive one-unit change in STRs (See Table 7).

Lastly, in the ZVHI Fayetteville output, there was a statistically significant $293 increase in the ZVHI for every 1 STR unit increase (See Table 8). For both cities, the regression outputs for the dependent variables of Median Listing Price and the Rent Indexes were not statistically significant regarding STRs (See figures 9-12).

While these outcomes do indicate a strong relationship between STRS and housing values and availability, the weight is likely not evenly distributed among all of the housing stock in the area for each city. Sub-divisions and housing units closer to attractions, amenities, and condo communities are more likely to be affected by the introduction of STRs due to the demand from tourists.

*Fayetteville Vs. Branson*

So why is there a difference in the housing value STRs add to each city? Moreover, why do STRs appear to have a stronger negative effect on Fayetteville's total housing units than Branson? Branson has more STRs than Fayetteville, and it has a smaller population and housing stock, so at first thought, the STRs in Branson would have a more significant dollar impact on the Housing Value Index than Fayetteville, not the other way around. However, because Fayetteville’s housing market is so tight, even with the cap on STRs, the small number in the city has a larger effect. In Branson, many of the STRs are in vacation communities or are out of reach, in terms of size and price, for many inhabitants of Branson. Many homes that were family vacation homes or situated in small lodge communities have since converted to the Airbnb platform, thus adding to the STR count but not taking away from the existing long-term housing

stock. Branson has a relatively high vacancy rate, meaning even with all the STRs, there is still more flexibility in the market than in Fayetteville, which had a 1.7% vacancy rate in April of 2024, creating an average of 6 qualified applicants per vacant unit (Talk Business, 2024). While Branson does have a housing problem and needs to increase options within a low-income range, this segmentation can be an explanation for why STRs appear to have a dramatic effect on housing but turn up smaller numbers than Fayetteville.

## VII. Limitations & Future Research

While a robust review of existing literature was reviewed for this paper, there are still limitations in the field of research on STRs as the industry has grown so quickly that many municipalities, at no fault of their own, have not had the level of data needed for a robust study at the individual city level. For example, Branson, Missouri, is just now implementing a system to track each registered STR business in the city accurately, leading to a large gap in accurate time-level data from the past 5-10 years. Sites like AirDNA and other data-sourcing websites only track within the last three years from the date of access, so there are limitations to detailed data on the full effects of Airbnb units on housing stock.

Due to the constraints of time, resources, and the undergraduate level of this research, several factors influencing housing prices were not measured in this study. These include the size of the home, its age, improvements, neighborhood location, and more (Sullivan, 2009). Future research should expand the scope to include these and other relevant factors, such as proximity to schools and amenities, to develop a more comprehensive model. Incorporating variables like inflation, the Consumer Price Index, and other housing variables from the correlation table into the regression analysis would enhance our understanding of their impact on the housing market.

This study faced challenges in building the linear regression model due to interactions between variables, limiting the number of variables that could be effectively used. Housing is a

complex issue with many contributing factors, and this research represents just a starting point for addressing some of the latest challenges in understanding the future of our cities.

**Policy recommendations**

Every city is unique and faces different challenges related to the age of housing, housing quantity, demographics, and missing middle housing. However, most cities in the United States are experiencing strain on their housing markets and vulnerable populations. Fayetteville has already implemented regulations restricting the number of full-time STRs. Continuing to allow unlimited part-time STRs, such as an individual's primary home rented during vacations or supplementing the mortgage with a private room rental, can assist communities through financial hardships, increase community income, and allow for a more flexible lifestyle. Additionally, in cities with low apartment vacancy rates and rapidly increasing prices or communities with high turnover, such as university cities, allowing landlords to enter Airbnb's apartment share program could help students who rent multiple apartments for summer internships or study abroad or young professionals who are increasingly taking work-from-home jobs that allow them to travel more frequently.

In a city like Branson, where median income levels are relatively low and residential home production lags behind new vacation rentals, it is crucial to protect existing housing stock and encourage new residential construction.

For most cities, a starting point when considering STR regulation is to identify market weaknesses: low-income levels, high tourist numbers, and the condition of existing housing stock.

To address these issues, there is potential for leveraging STRs to support local affordable housing plans. Many cities, including Bentonville, Arkansas, currently collect a hotel tax

aggregated by platforms like Airbnb (Visit Bentonville, 2024). However, a system like Bentonville's does not fully capitalize on the potential revenue for city operations and makes it challenging to monitor STR impacts. By creating a proactive local action plan, cities could encourage the development of an affordable housing unit for every new STR registered.

A potential route is to establish an affordable housing or neighborhood fund by implementing a small fee on STRs, which would go towards development subsidies for downtown apartments or multi-use housing. These funds could be used as developer incentives to keep rental rates lower and closer to pre-STR introduction rates. For example, if in-city rental rates were measured to have increased by 30% from 2011 to 2017 due to STRs, the fee collected from an STR could help bridge the gap between the market price and the adjusted pre-STR price for one rental unit. This fee could be implemented on a sliding scale based on rental location, residential density, commercial versus individual owners, and primary home use. In dense neighborhoods near job centers and in high demand by residents, the STR city operating fee could be higher than in less desirable neighborhoods. Additionally, the fee could be waived if the unit is a primary home and non-commercially owned, as the unit remains in the housing stock.

Since people tend to be wary of new taxes, cities are more likely to succeed through active community participation during the plan's creation and through community education on factors impacting the housing market and the benefits of a program that assists low to median-income renters. There could be pushback from states with more fiscally conservative views due to existing precedents of voting against taxes and fees, especially those targeting business owners. Some short-term rental owners might also oppose this policy.

## VIII. Conclusion

While STRs are not the sole factor in our current housing crisis, they are a significant part of our hospitality and living fabric. Their effects must be addressed so cities can implement

policies that help neighborhoods and residents thrive. While existing research suggests a relationship between an increase in the STR industry and housing availability and prices, additional research on how STRs affect home prices is needed in a wider variety of cities to support the theory further. As the rate of short-term rentals increases, it is vital to consider the sharing economy's ethical implications. Often, short-term rentals impact neighborhoods by driving up rent prices, which can displace renters. Additionally, because beneficiaries of Airbnb are typically white and high-wealth households, more research is a beneficial tool for cities as they develop policies that can address issues of equity and support populations most affected by any changes in housing availability affected by STRs.

Because the freedom for people to start their own businesses and offer unique experiences for guests and hosts has massive appeal, the STR industry is not going anywhere soon. STRs can be a beneficial tool for homeowners or renters looking to make some additional income while traveling, support their mortgage, or create an extra income stream in their hometown. In cities with huge tourist populations and few options for large families to stay, places where hotels and resorts have traditionally dominated are now finding platforms like Airbnb and VRBO to be an easier way to meet future visitors' needs.

However, in cities like Branson, where 20% of the residents are considered unhoused, there is also a great need to ensure the addition and protection of existing housing stock is allocated to the essential workforce. In Northwest Arkansas, where rents and home values are escalating at a runaway pace, the development of housing at attainable prices must be addressed to address growing issues of sprawl, public health, and vehicle congestion. Thus, there is a need to ensure that housing needs are put first and that local population, economic, and growth needs are also considered as cities address their STR industry in a fair and equitable way. As the

industry grows, more research is needed to guide policy decisions that affect the short-term rental industry to maximize its benefits to society and minimize the adverse effects.

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# X. Appendixes

*Table 1*

*Fayetteville, Arkansas Data Tables*

| Year | STRs | ZHVI (Dollars) | Total Housing Units | Residents Without Housing | Median Household Income (Dollars) | Housing Median Days on Market Fayetteville, Springdale, Rogers |
|---|---|---|---|---|---|---|
| 2018 | 504.00 | 204161.29 | 45717.00 | 202 | 42101.00 | 53.00 |
| 2019 | 500.00 | 217571.75 | 46986.00 | 242 | 43690.00 | 64.00 |
| 2020 | 480.00 | 230204.56 | 47895.00 | 251 | 47350.00 | 51.00 |
| 2021 | 504.00 | 265716.49 | 49048.00 | 61 | 52111.00 | 35.00 |
| 2022 | 696.00 | 327717.11 | 49895.00 | 198 | 56881.00 | 33.00 |
| 2023 | 759.00 | 338186.57 | 51706.00 | 260 | 54496.00 | 52.00 |

| Year | Median List Price (Dollars) | Population | ZORI RENT INDEX | 30 Year Fixed Mortgage rate (percent) | Inflation (percent) |
|---|---|---|---|---|---|
| 2018 | 262525.00 | 86712.00 | 1194.95 | 4.00 | 1.90 |
| 2019 | 273335.00 | 87518.00 | 1235.83 | 4.51 | 2.30 |
| 2020 | 279450.00 | 93949.00 | 1262.50 | 3.72 | 1.40 |
| 2021 | 295217.00 | 95230.00 | 1378.53 | 2.65 | 7.00 |
| 2022 | 363750.00 | 99285.00 | 1509.35 | 3.22 | 6.50 |
| 2023 | 422167.00 | 92538.80 | 1629.16 | 6.48 | 3.40 |

*Table 2 Branson MO, Data Table*

| Year | STRS | Zillow Home Value Index | Total Housing Units | Median Household Income (dollars) | Median Days on Market |
|---|---|---|---|---|---|
| 2018 | 198.00 | 138378.61 | 8688.00 | 40887.00 | 71.00 |
| 2019 | 307.00 | 156655.56 | 8389.00 | 49313.00 | 85.00 |
| 2020 | 2300.00 | 159735.73 | 8347.00 | 44670.00 | 83.00 |
| 2021 | 3500.00 | 189602.88 | 8354.00 | 47210.00 | 34.00 |
| 2022 | 4300.00 | 238715.07 | 8347.00 | 53009.00 | 42.00 |
| 2023 | 5100.00 | 255429.58 | 8354.00 | 50109.50 | 58.00 |

| Year | Median List Price (Dollars) | population | Median Gross Rent (Dollars) | Out of town visitors | 30 Year Fixed Mortgage rate | Inflation (percent) |
|---|---|---|---|---|---|---|
| 2018 | 254400.00 | 11557.00 | 810.00 | 9000000 | 4.00 | 1.90 |
| 2019 | 266000.00 | 11657.00 | 857.00 | 9100000 | 4.51 | 2.30 |
| 2020 | 286033.00 | 12638.00 | 845.00 | 6200000 | 3.72 | 1.40 |
| 2021 | 369633.00 | 12883.00 | 919.00 | 10000000 | 2.65 | 7.00 |
| 2022 | 413333.00 | 12497.00 | 916.00 | 10200000 | 3.22 | 6.50 |
| 2023 | 409900.00 | 12246.40 | 917.50 | 8900000 | 6.48 | 3.40 |

*Table 3*

*Fayetteville Arkansas Correlation Table*

| | STRS | Zillow Home Value Index | Total Housing Units | Residents Without Housing | Median Household Income (dollars) | ays on Market Fayetteville, Springdo | Median List Price | population | ZORI RENT INDEX | 30 Year Fixed mortage rate | Inflation |
|---|---|---|---|---|---|---|---|---|---|---|---|
| STRS | 1 | | | | | | | | | | |
| Zillow Home Value Index | 0.92734209 | 1 | | | | | | | | | |
| Total Housing Units | 0.8404314 | 0.952842853 | 1 | | | | | | | | |
| Residents Without Housing | 0.28081865 | 0.013836707 | 0.016209832 | 1 | | | | | | | |
| Median Household Income (I | 0.77040633 | 0.949418585 | 0.911642686 | -0.201487012 | 1 | | | | | | |
| Median Days on Market Fay | -0.2788009 | -0.537825535 | -0.435649611 | 0.666605364 | -0.736823249 | 1 | | | | | |
| Median List Price | 0.97362031 | 0.953893402 | 0.93219606 | 0.231241188 | 0.81879355 | -0.288933536 | 1 | | | | |
| population | 0.44374931 | 0.707711883 | 0.662529215 | -0.30541079 | 0.882047381 | -0.854964941 | 0.490600047 | 1 | | | |
| ZORI RENT INDEX | 0.93194017 | 0.986082408 | 0.973400865 | 0.041718815 | 0.906256951 | -0.444752501 | 0.978127624 | 0.612545 | 1 | | |
| 30 Year Fixed mortage rate | 0.55859449 | 0.316147344 | 0.395283417 | 0.698961351 | 0.028814973 | 0.586641522 | 0.582030886 | -0.3635534 | 0.432525457 | 1 | |
| Inflation | 0.34204268 | 0.593988524 | 0.51178065 | -0.741560644 | 0.74772747 | -0.868709577 | 0.357049622 | 0.72785184 | 0.526149802 | -0.458270916 | 1 |

*Table 4*

*Branson MO Correlation Table*

| | STRS | Zillow Home Value Index | Total Housing Units | Median Household Income (dollars) | Median Days on Market | Median List Price (Dollars) | population | Median Gross Rent (Dollars) | Out of town visitors | 30 Year Fixed mortage rate (percent) | Inflation (Percent) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| STRS | 1 | | | | | | | | | | |
| Zillow Home Value Index | 0.93187229 | 1 | | | | | | | | | |
| Total Housing Units | -0.6458771 | -0.571435907 | 1 | | | | | | | | |
| Median Household Income (dollars) | 0.63967402 | 0.78759371 | -0.747312214 | 1 | | | | | | | |
| Housing Inventory: Housing Median Days on Mar | -0.6882861 | -0.611782023 | 0.260412929 | -0.416448347 | 1 | | | | | | |
| Median List Price (Dollars) | 0.95988085 | 0.958357691 | -0.584960926 | 0.743134404 | -0.798304527 | 1 | | | | | |
| population | 0.70509275 | 0.432364177 | -0.701133145 | 0.309988862 | -0.602925287 | 0.606036394 | 1 | | | | |
| Median Gross Rent (Dollars) | 0.88258811 | 0.868225511 | -0.73761738 | 0.805691822 | -0.780217328 | 0.936486239 | 0.65513907 | 1 | | | |
| (outof town visitors) | 0.22544902 | 0.389525392 | 0.051755375 | 0.46149163 | -0.711380749 | 0.479718146 | -0.0567167 | 0.518122082 | 1 | | |
| 30 Year Fixed mortage rate (percent) | 0.19631945 | 0.374939659 | -0.02523587 | 0.160614977 | 0.345205716 | 0.126397296 | -0.3996156 | 0.049040027 | -0.172656863 | 1 | |
| Inflation (Percent) | 0.61181248 | 0.563267846 | -0.40927823 | 0.568381181 | -0.950019243 | 0.754711652 | 0.61004895 | 0.812361197 | 0.751734106 | -0.458270916 | 1 |

*Table 5*

*Branson ZHVI Regression Output*

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.99998713 |
| R Square | 0.99997426 |
| Adjusted R Square | 0.99987129 |
| Standard Error | 540.439913 |
| Observations | 6 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 4 | 1.1346E+10 | 2836558474 | 9711.73693 | 0.00761033 |
| Residual | 1 | 292075.3 | 292075.3 | | |
| Total | 5 | 1.1347E+10 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 1771233.22 | 34883.0444 | 50.7763372 | 0.0125361 | 1328002.12 | 2214464.33 | 1328002.12 | 2214464.33 |
| STRS | 32.2730911 | 0.24574155 | 131.329404 | 0.00484741 | 29.1506486 | 35.3955335 | 29.1506486 | 35.3955335 |
| Population | -72.431427 | 1.20459859 | -60.129098 | 0.01058657 | -87.737303 | -57.12555 | -87.737303 | -57.12555 |
| Total Housing Units | -88.571907 | 2.83601386 | -31.231126 | 0.02037718 | -124.60688 | -52.536935 | -124.60688 | -52.536935 |
| 30 Year Fixed Mortgage rate (percent) | -825781.23 | 31603.0439 | -26.1298 | 0.02435186 | -1227336 | -424226.48 | -1227336 | -424226.48 |

*Table 6*

*Branson Total Housing Regression Output*

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.99978042 |
| R Square | 0.9995609 |
| Adjusted R Square | 0.99780448 |
| Standard Error | 6.35158273 |
| Observations | 6 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 4 | 91834.4907 | 22958.6227 | 569.091255 | 0.03142761 |
| Residual | 1 | 40.3426032 | 40.3426032 | | |
| Total | 5 | 91874.8333 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 14339.2041 | 176.947514 | 81.0364827 | 0.00785557 | 12090.8728 | 16587.5355 | 12090.8728 | 16587.5355 |
| STRS | 0.07121348 | 0.0036018 | 19.7716309 | 0.03217123 | 0.02544826 | 0.1169787 | 0.02544826 | 0.1169787 |
| population | -0.3689006 | 0.01257243 | -29.342021 | 0.02168813 | -0.5286485 | -0.2091527 | -0.5286485 | -0.2091527 |
| Median Household Income (dollars) | -0.0275911 | 0.00092014 | -29.985807 | 0.02122284 | -0.0392825 | -0.0158996 | -0.0392825 | -0.0158996 |
| 30 Year Fixed mortgage rate (percent) | -6928.1572 | 354.641849 | -19.535645 | 0.03255918 | -11434.309 | -2422.0052 | -11434.309 | -2422.0052 |

*Table 7*

*Fayetteville Total Housing Regression Output*

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.99992085 |
| R Square | 0.99984171 |
| Adjusted R Square | 0.99920855 |
| Standard Error | 60.2303754 |
| Observations | 6 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 4 | 22914279.1 | 5728569.78 | 1579.11976 | 0.01887107 |
| Residual | 1 | 3627.69812 | 3627.69812 | | |
| Total | 5 | 22917906.8 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 31601.4503 | 1369.0731 | 23.0823689 | 0.02756311 | 14205.7272 | 48997.1735 | 14205.7272 | 48997.1735 |
| STRS | -9.6814201 | 0.67665933 | -14.307673 | 0.04442275 | -18.279192 | -1.0836482 | -18.279192 | -1.0836482 |
| population | -0.0806445 | 0.02223308 | -3.6272318 | 0.17125693 | -0.3631426 | 0.20185355 | -0.3631426 | 0.20185355 |
| Median Household Income (In dollars) | 0.52715391 | 0.02176247 | 24.2230745 | 0.02626663 | 0.25063552 | 0.80367229 | 0.25063552 | 0.80367229 |
| 30 Year Fixed mortgage rate | 95306.912 | 4307.72964 | 22.1246271 | 0.02875469 | 40572.0172 | 150041.807 | 40572.0172 | 150041.807 |

*Table 8*

*Fayetteville ZVHI Regression Output*

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.99990271 |
| R Square | 0.99980543 |
| Adjusted R Square | 0.99902715 |
| Standard Error | 1788.75842 |
| Observations | 6 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 4 | 1.6442E+10 | 4110404516 | 1284.63923 | 0.02092186 |
| Residual | 1 | 3199656.69 | 3199656.69 | | |
| Total | 5 | 1.6445E+10 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | -547717.33 | 29476.3088 | -18.581612 | 0.03422772 | -922249.34 | -173185.31 | -922249.34 | -173185.31 |
| STRS | 293.082232 | 14.7019683 | 19.9348976 | 0.03190819 | 106.276013 | 479.88845 | 106.276013 | 479.88845 |
| population | -0.2807435 | 0.57633264 | -0.4871206 | 0.71142592 | -7.6037441 | 7.04225706 | -7.6037441 | 7.04225706 |
| Total Housing Units | 14.7155296 | 1.22500283 | 12.0126495 | 0.05287387 | -0.8496071 | 30.2806664 | -0.8496071 | 30.2806664 |
| 30 Year Fixed mortgage rate | -1097416.4 | 181560.307 | -6.0443632 | 0.10437906 | -3404358.9 | 1209526 | -3404358.9 | 1209526 |

*Table 9*

*Fayetteville AR Median List Price Regression Output*

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.99941816 |
| R Square | 0.99883666 |
| Adjusted R Square | 0.99418332 |
| Standard Error | 4823.45905 |
| Observations | 6 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 4 | 1.9976E+10 | 4993977304 | 214.649249 | 0.05114172 |
| Residual | 1 | 23265757.2 | 23265757.2 | | |
| Total | 5 | 1.9999E+10 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | -467088.77 | 79484.0527 | -5.8765093 | 0.1073051 | -1477029.4 | 542851.874 | -1477029.4 | 542851.874 |
| STRS | 298.046361 | 39.6444489 | 7.5179847 | 0.08418541 | -205.68412 | 801.776845 | -205.68412 | 801.776845 |
| Population | 0.00889179 | 1.55410416 | 0.00572149 | 0.99635763 | -19.737874 | 19.7556574 | -19.737874 | 19.7556574 |
| Total Housing Units | 12.1915437 | 3.30326941 | 3.69075063 | 0.1684463 | -29.780474 | 54.1635611 | -29.780474 | 54.1635611 |
| 30 Year Fixed Mortgage Rate | 477437.792 | 489584.671 | 0.97518942 | 0.50799623 | -5743325.3 | 6698200.86 | -5743325.3 | 6698200.86 |

*Table 10*

*Fayetteville, AR Rent Index Regression Output*

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.99956103 |
| R Square | 0.99912225 |
| Adjusted R Square | 0.99561126 |
| Standard Error | 11.3529803 |
| Observations | 6 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 4 | 146712.966 | 36678.2415 | 284.569752 | 0.04442722 |
| Residual | 1 | 128.890162 | 128.890162 | | |
| Total | 5 | 146841.856 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | -1284.5444 | 187.081693 | -6.8662215 | 0.0920703 | -3661.6426 | 1092.55395 | -3661.6426 | 1092.55395 |
| STRS | 0.69586751 | 0.09331118 | 7.45749351 | 0.08486025 | -0.4897634 | 1.88149845 | -0.4897634 | 1.88149845 |
| Population | -0.0087938 | 0.0036579 | -2.4040704 | 0.25094906 | -0.0552718 | 0.03768414 | -0.0552718 | 0.03768414 |
| Total Housing Units | 0.06597345 | 0.00777491 | 8.48543097 | 0.07468058 | -0.0328161 | 0.16476303 | -0.0328161 | 0.16476303 |
| 30 Year Fixed Mortgage Rate | -3302.9914 | 1152.33592 | -2.8663442 | 0.21369641 | -17944.808 | 11338.8247 | -17944.808 | 11338.8247 |

*Table 11*

*Branson, MO Rent Index Regression Output*

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.94438702 |
| R Square | 0.89186684 |
| Adjusted R Square | 0.4593342 |
| Standard Error | 34.232464 |
| Observations | 6 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 4 | 9665.34674 | 2416.33669 | 2.06196424 | 0.47547506 |
| Residual | 1 | 1171.86159 | 1171.86159 | | |
| Total | 5 | 10837.2083 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 2921.07863 | 2209.55657 | 1.3220203 | 0.41227243 | -25153.999 | 30996.1568 | -25153.999 | 30996.1568 |
| STRS | 0.02499935 | 0.01556572 | 1.60605094 | 0.35453624 | -0.1727819 | 0.22278063 | -0.1727819 | 0.22278063 |
| Population | -0.0544947 | 0.0763015 | -0.714202 | 0.60517221 | -1.0239972 | 0.91500784 | -1.0239972 | 0.91500784 |
| Total Housing Units | -0.1640516 | 0.17963837 | -0.9132326 | 0.52885172 | -2.4465734 | 2.11847024 | -2.4465734 | 2.11847024 |
| 30 Year Fixed Mortgage Rate (percent) | -1505.2728 | 2001.79527 | -0.7519614 | 0.58953607 | -26940.493 | 23929.9477 | -26940.493 | 23929.9477 |

*Table 12*

*Branson, MO Median List Price Regression Output*

SUMMARY OUTPUT

| *Regression Statistics* | |
|---|---|
| Multiple R | 0.99439049 |
| R Square | 0.98881244 |
| Adjusted R Square | 0.94406219 |
| Standard Error | 17244.7899 |
| Observations | 6 |

ANOVA

| | *df* | *SS* | *MS* | *F* | *Significance F* |
|---|---|---|---|---|---|
| Regression | 4 | 2.6284E+10 | 6571043164 | 22.0962465 | 0.15806524 |
| Residual | 1 | 297382777 | 297382777 | | |
| Total | 5 | 2.6582E+10 | | | |

| | *Coefficients* | *Standard Error* | *t Stat* | *P-value* | *Lower 95%* | *Upper 95%* | *Lower 95.0%* | *Upper 95.0%* |
|---|---|---|---|---|---|---|---|---|
| Intercept | 2044204.01 | 1113076.13 | 1.83653566 | 0.31742716 | -12098769 | 16187177.3 | -12098769 | 16187177.3 |
| STRS | 50.1795186 | 7.84131828 | 6.39937276 | 0.09868351 | -49.453877 | 149.812914 | -49.453877 | 149.812914 |
| Population | -89.324306 | 38.4372972 | -2.3238967 | 0.25869752 | -577.71647 | 399.067862 | -577.71647 | 399.067862 |
| Total Housing Units | -77.851897 | 90.4938032 | -0.8603009 | 0.54771735 | -1227.6847 | 1071.98089 | -1227.6847 | 1071.98089 |
| 30 Year Fixed Mortgage Rate (percent) | -2285778.1 | 1008415.25 | -2.2667033 | 0.26450669 | -15098909 | 10527352.5 | -15098909 | 10527352.5 |