

Analyzing Rental Demand and Affordability Across U.S. Markets

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Introduction

Housing and rental affordability are pressing issues in many regions of the United States. Consistent rises in rent prices have resulted in households not knowing if they are going to be able to have a place to stay next month, especially families in high-density metropolitan areas. This project aims to examine the relationship between rent prices and demand to identify regions of the United States where affordability may be challenging for renters. The question driving this analysis is: "How do rental prices and demand interact across U.S. regions, and which areas exhibit the most significant affordability challenges?" By analyzing these trends, this project provides insights into regions that may offer cost-effective alternatives for renters or reveal larger market inefficiencies.

Visualization Design and Methodology

Zillow provides rental data in the form of two datasets: Zillow Observed Rent Index (ZORI), and Zillow Observed Renter Demand Index (ZORDI). ZORI provides a smoothed measure of typical market rent values for a region. ZORDI tracks rental market engagement for a region, giving us a way to see consistent patterns in that rental market. This dataset contains 636 unique cities.

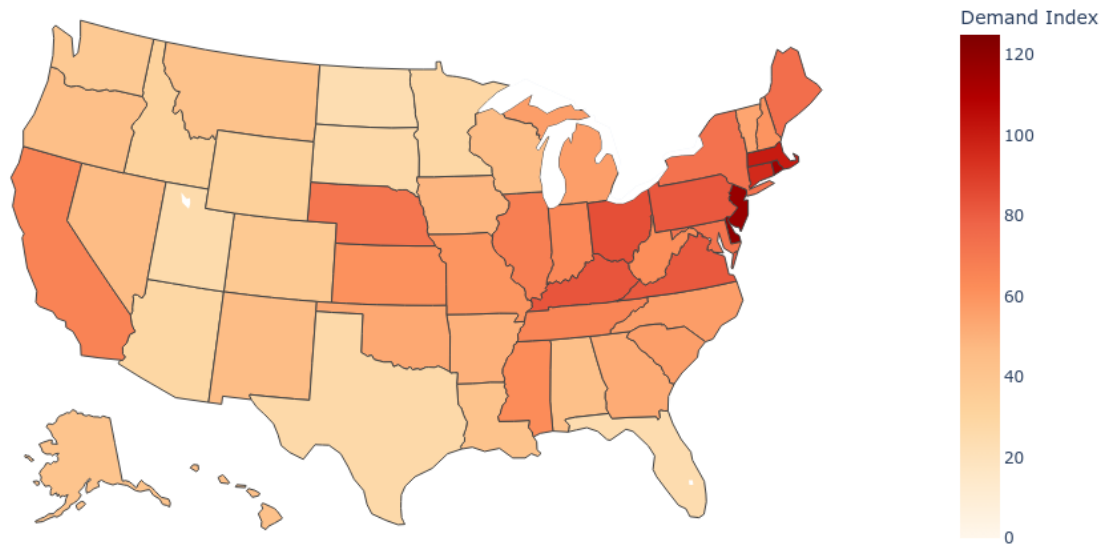
To start my analysis, I merged the ZORI and ZORDI datasets to have easy access to the rent demand and price indexes in one place. Using this new dataset, I feature engineered four variables:

1. Rent to Demand Ratio
 - Measures how rent prices compare to market demand.
2. Year over Year Changes
 - Measures annual growth rates for rent and demand.
3. Month over Month Changes
 - Measures monthly changes in rent and demand.
4. Market Pressure

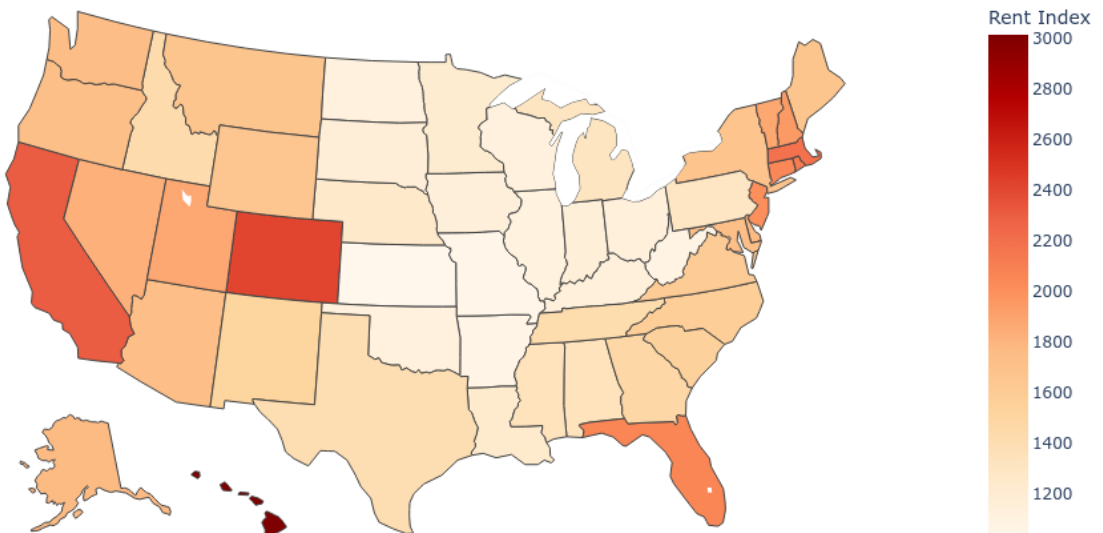
- Composite score based on rent and demand. Essentially a metric for assessing the "competitiveness" of a rental market.

The first visual I created was to see the average rent price and demand by state.

Rental Demand Across US States (ZORDI)

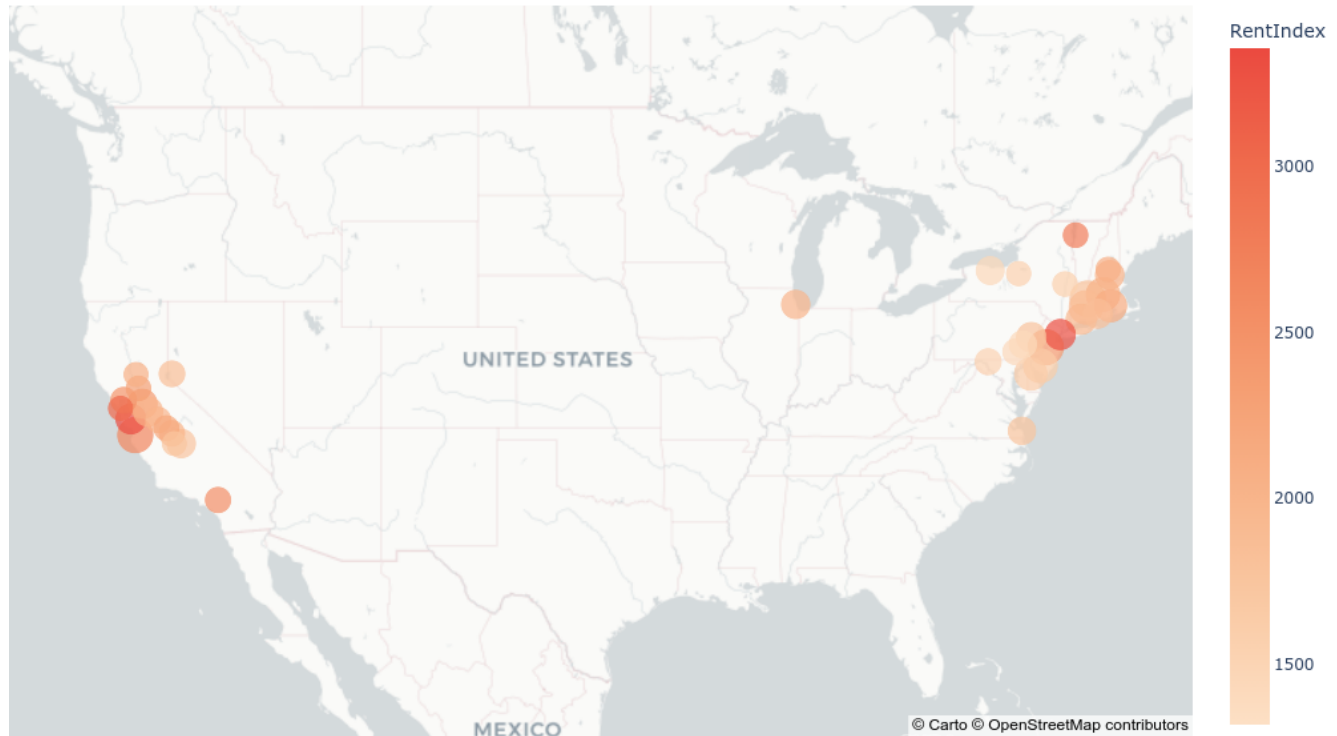


Average Rent Price Across US States (ZORI)



These graphs allow users to zoom in and hover over individual states to see the relevant data.

Hottest Rental Markets in the United States

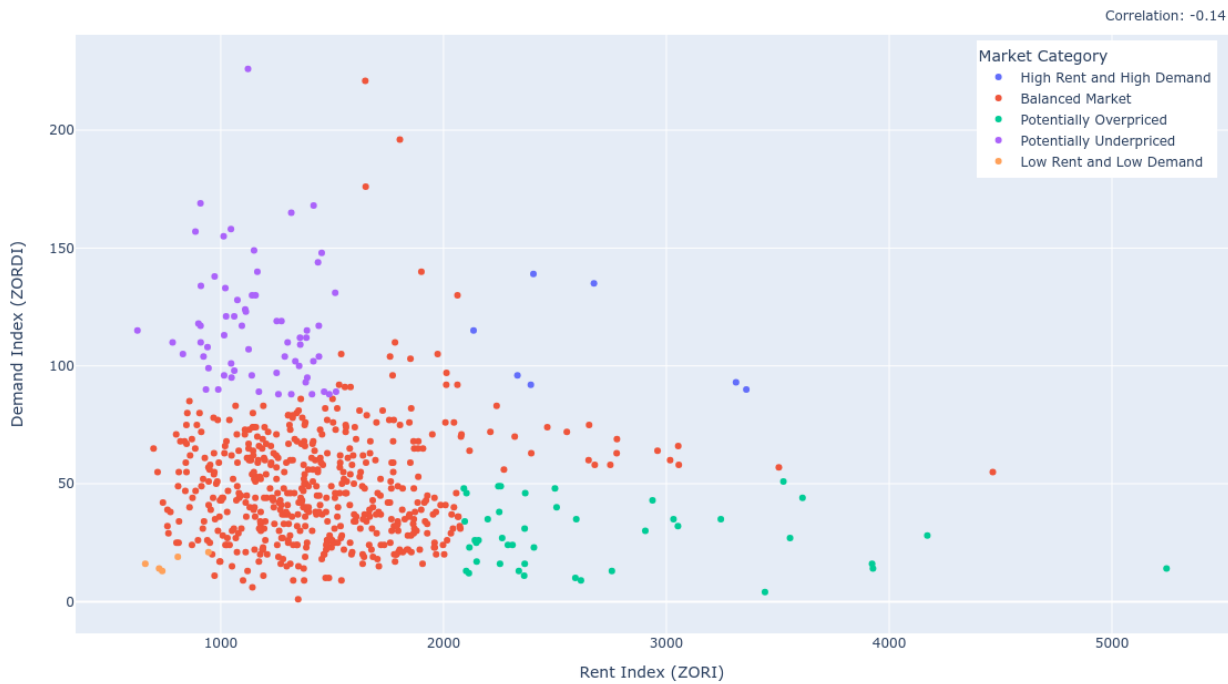


Being able to have a basic understanding of popular rental markets and how rent price is correlated provides a good starting point for further analysis into why these factors exist.

Next, I classified each of the 636 cities into one of five categories based on their rent and demand alignment. For each city, I identified the Z-score for Rent and Demand, and categorized into the following market classifications:

- Balanced Market
- Potentially Underpriced Market
- Potentially Overpriced Market
- High Rent and High Demand Market
- Low Rent and Low Demand Market

Rent Prices vs. Rent Demand in US Cities

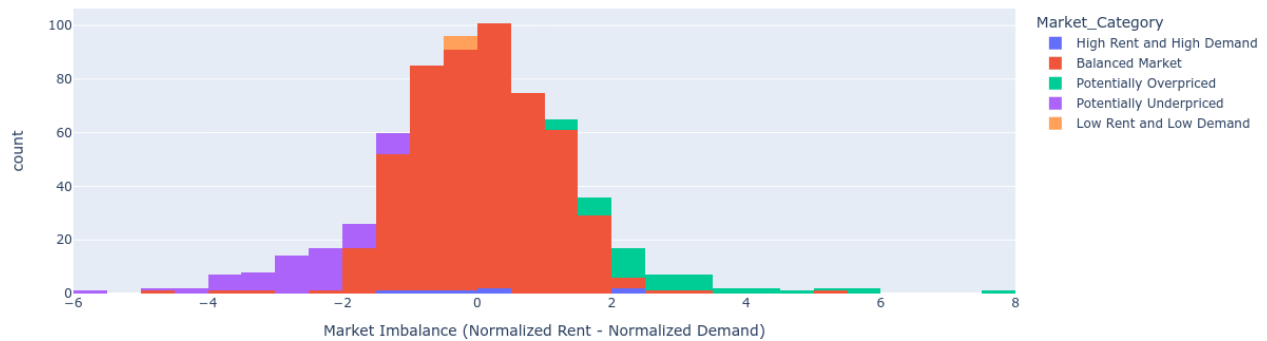


This scatter plot allows users to zoom in and view specific information for a city including:

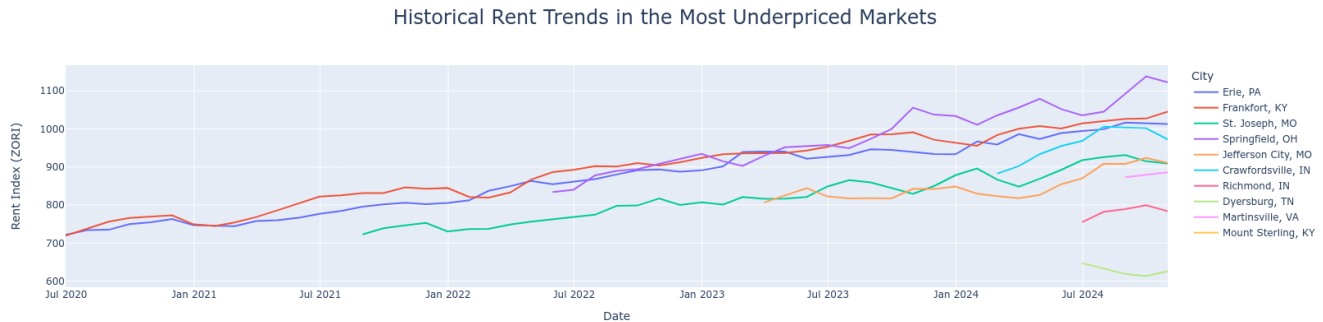
- Rent Index, Demand Index, Market Category, Year-Over-Year Rent Change and Demand Change

Based on this scatter plot, I was able to display the distribution of market imbalance to reveal any trends on a national scale.

Distribution of Market Imbalance in the United States



The final visualization I created was a line chart to show rent price trends in the most underpriced markets in the country. Users are able to hover over each city along the line to see how the price of rent has changed from 2020 to 2024.



Insights and Findings

These visualizations provide several key insights:

Viewing the rent price and demand averages by state showed that high-density metropolitan areas, like California and Florida, exhibits high rent prices but disproportionate demand, emphasizing affordability challenges.

The line chart showed that the most underpriced markets in the country are concentrated in the Midwest region. These are areas with relatively low rent prices with high demand, suggesting opportunities for affordable living. Cities in these areas have consistently had low rent price growth compared to the volatility seen in metropolitan markets.

The bell-shaped distribution reveals a tendency for rental markets to skew towards overpricing. This suggests that affordability issues in large metropolitan areas might be affected by external factors such as limited development opportunities and regulatory constraints.

These findings outline the need for specific policy interventions and provide a plan to allow renters to have an affordable option in the more popular, metropolitan markets.

Reflection and Future Improvements

Throughout this project, I learned a lot about how the rental market in America works. Classifying the cities into different market categories allowed me to understand how different rental markets operate throughout the country.

The datasets I used from Zillow for this project only had data from June 2020 until the end of October 2024. Therefore, I was not able to do any comprehensive long-term market analysis due to the lack of data. The lack of more granular data for each city, such as a breakdown by neighborhood or by income, lessened the potential complexity of analysis.

In the future, I would like to combine other data sources to include variables like household income and employment rate to enable myself to have a better understanding of how these factors relate to the overall price and demand for a rental market.

References

Housing Data. Zillow. (2024, November 11). <https://www.zillow.com/research/data/>