A Spatial Analysis of Texas Home Value Growth by County, 2017–2023

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1. Introduction

This project analyzes county-level home value growth across Texas using the Zillow Home Value Index (ZHVI). The objective is to identify spatial patterns in housing appreciation in the 3 years before and the 3 years after the COVID-19 pandemic and demonstrate skills in data cleaning, transformation, geospatial analysis, and choropleth visualization.

2. Data Sources

Zillow Home Value Index (ZHVI): For this project, the data used is the monthly county-level home value estimates (ZHVI) for single-family residences as well as condominium/co-op properties.

Link: https://www.zillow.com/research/data/

3. Data Preparation and Transformation

Zillow provides their data in a wide format, with each month representing a separate column. This data needed to be transformed into a long format for proper filtering and aggregation. This analysis focuses on Texas counties only, and looks at home values in 2017, 2020, and 2023. This reveals county-level trends in home value from before and after the Covid-19 Pandemic.

After transforming and aggregating the Zillow data, it was converted back to a wide format to compare home values across time in each county. This allowed for the calculation of percantage change in home value from 2017-2020, and 2020-2023. This provides the growth metric needed to compare changes in home value by county.

Note: There were some missing counties in the Zillow data, represented by NA in the data. This was due to Zillow not having complete data for every county in Texas for each year.

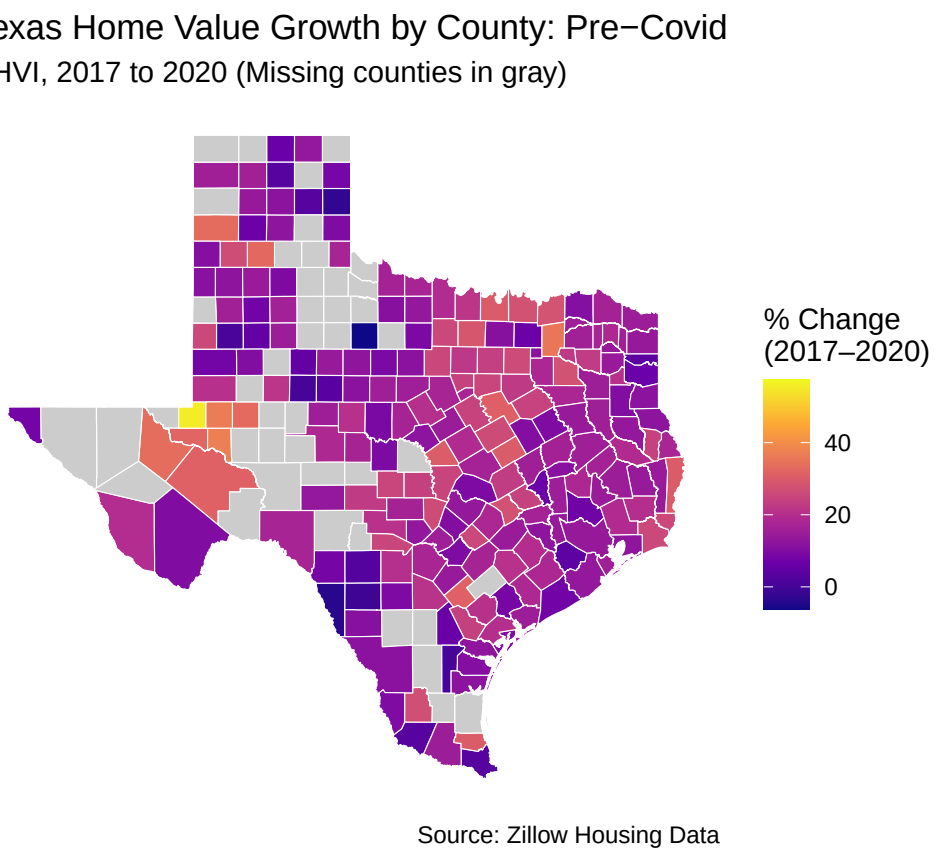
4. Geospatial Analysis

The tigris package in R was used to get U.S. Census county boundary shape-files. Standardizing county names across the Census shape-files from tigris and the growth metric data allowed for them to be joined into one data frame.

5. Results: Choropleth Maps

The next step is to make a graph of Texas, with the percentage change in ZHVI value being used as a scale to color each county.

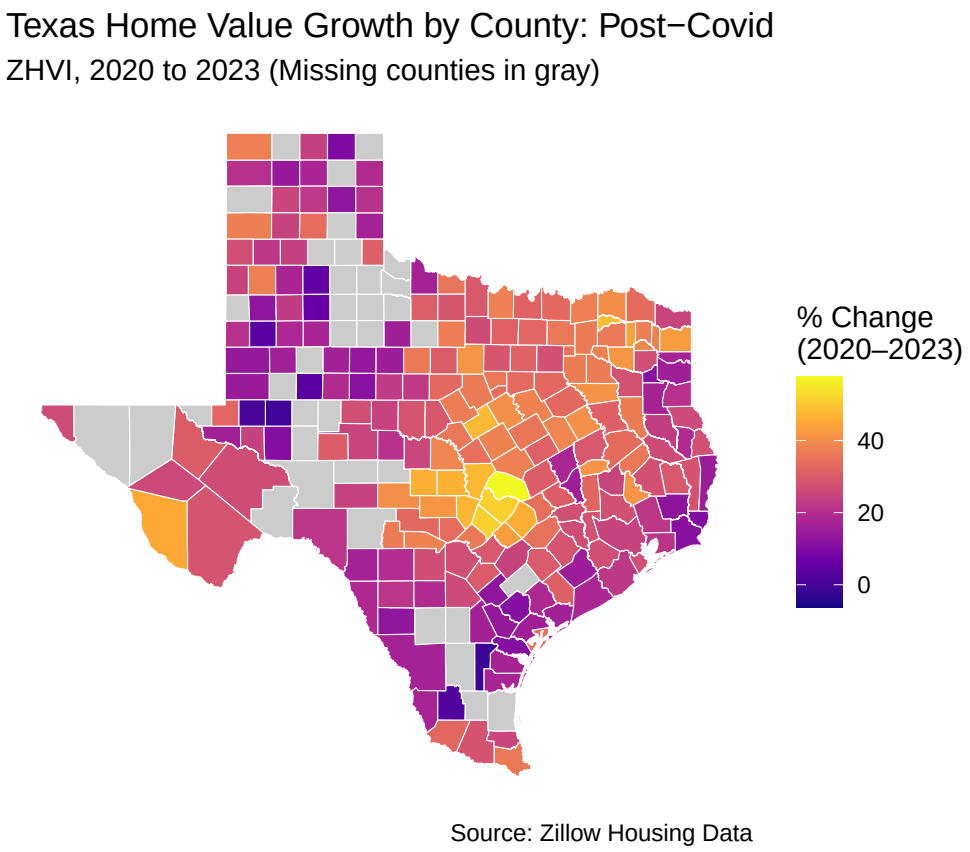
5.1 Home Value Growth: 2017–2020



Observations:

- We can see that home values grew the most in urban and sub-urban counties
- Rural counties also generally experienced growth, but not to the same degree as non-rural counties

5.2 Home Value Growth: 2020–2023



Observations:

- We see again that growth very is strong in urban and sub-urban counties, outpacing pre-Covid rates
- Home values continued growing in rural counties, and even outpaced what was seen pre-Covid, but still not to the degree as non-rural counties
- The disparity in growth between urban/sub-urban counties and rural counties is much more pronounced post-Covid.

Interpretation:

Post-pandemic growth accelerated significantly in urban and suburban counties. Growth was more concentrated around metropolitan areas, though rural counties still grew more than they did pre-Covid.

6. Conclusion

This analysis demonstrates how Zillow ZHVI data combined with U.S. Census spatial boundaries can be used to identify housing market trends across Texas. The results highlight strong metropolitan growth and post-pandemic acceleration. The workflow reflects skills relevant to Texas residential real estate research.