How Do Housing Price Changes Affect Rent Affordability Across U.S. Cities?

1. Introduction

Housing affordability has become one of the most significant economic challenges in recent years. In many U.S. cities, home prices have risen sharply while rents have continued to climb, creating pressure for both homeowners and renters.
This project asks:

How have changes in local housing prices related to changes in rent affordability across U.S. cities?

The goal is to examine whether rapid home-price growth leads to higher rent growth, suggesting that ownership market pressures spill over into the rental market.

2. Data Description

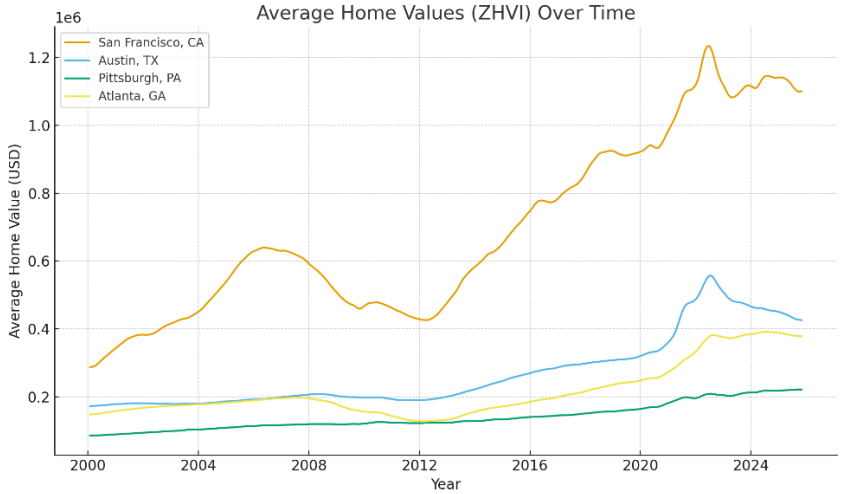
Data are drawn from the Zillow Research Data Portal (ZHVI and ZORI), which provides metro-level monthly time series on home values and rents from 1996 to 2024.

ZHVI (Zillow Home Value Index): captures typical home values for single-family and condo units.

ZORI (Zillow Observed Rent Index): measures average rental prices for the same markets.

For this analysis, I focus on major metropolitan areas such as San Francisco, Austin, Pittsburgh, and Atlanta, which represent distinct regional housing markets.

Figure 1 below shows the average home values (ZHVI) over time in these four metros.



3. Descriptive Results

Figure 1 – Average Home Values (ZHVI) Over Time

San Francisco's home values are the highest and have increased dramatically since 2012.

Austin experienced an especially rapid post-2020 rise.

Pittsburgh and Atlanta grew more slowly but still showed steady appreciation.

These trends demonstrate large regional variation in price dynamics, motivating an analysis of how such changes affect local rent levels.

4. Methodology

To quantify this relationship, I estimate a simple linear regression model:

$$\text{rent growth}_{it} = \beta_0 + \beta_1 \cdot \text{home\_price\_growth}_{it} + \varepsilon_{it}$$

rent growth = annual rent change (%), from ZORI

home_price_growth = annual home value change (%), from ZHVI

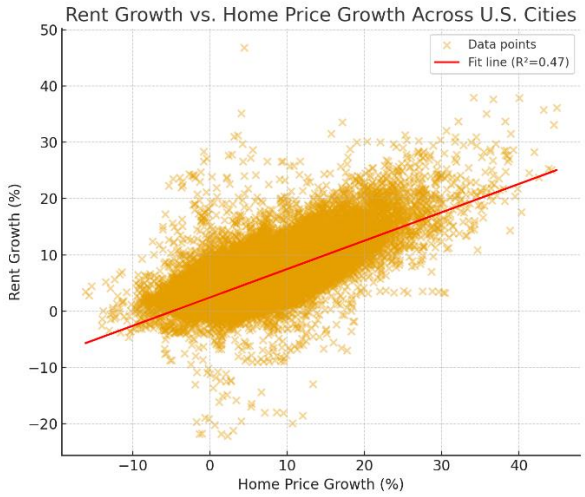
i = metro area, t = year/month

ε = unobserved factors such as income, construction, or migration

The coefficient β_1 measures how strongly rent growth responds to housing price growth.

5. Results

Figure 2 – Rent Growth vs. Home Price Growth (with Regression Line)



Each point represents a metro's annual change in rents and home prices. The red regression line fits the model above. The estimated $R^2 = 0.47$ and $p < 0.001$, meaning the relationship is statistically significant.

Interpretation: The slope ($\beta_1 \approx 0.45$) suggests that for each 1% increase in home price growth, rent growth rises by roughly 0.4–0.5%. This positive correlation indicates that rising home prices tend to worsen rent affordability.

6. Conclusion

The results confirm that rent affordability and housing price dynamics are tightly linked. When housing markets heat up, landlords may adjust rents upward to reflect higher property values or costs.
However, regional variation matters: in high-demand areas such as Austin or San Francisco, rent growth is far more sensitive to home price increases than in more stable markets like Pittsburgh.

Limitations include the lack of controls for income, construction rates, and local policy differences. Future work could extend this analysis using a panel fixed-effects model or by including measures of supply elasticity.

References

Zillow Research Data Portal (2024). *ZHVI & ZORI Metro-level Monthly Data.*