Cost-Benefit Analysis: Rent vs. Buy in the Largest 50 U.S. Cities

Yu Han Wu

wu589@wisc.edu

University of Wisconsin - Madison

Department of Economics

April 22, 2025

Introduction

The decision to rent or buy a home is one of the most significant financial choices households face, with long-term implications for wealth accumulation, liquidity, and consumption. In high-cost metropolitan areas, housing prices and rents are both steadily rising (shown in Figure 1 and 2), the financial trade-offs between renting and buying are especially complex. This paper is a cost-benefit analysis comparing the financial implications of renting versus buying a home across the 50 most populous U.S. cities. The analysis is conducted using Zillow's market data on monthly home prices and rental prices, the Tax Foundation's data on state property tax in 2023, and author's calculations of home appreciation rate and rental price inflation rate on Zillow's home prices and rental prices, respectively.

The evaluation spans both 15-year and 30-year time horizons to reflect varying financial goals and timeframes. For each city, the net present value (NPV) of renting and buying is computed under consistent economic assumptions, including mortgage rates, discount rates, insurance costs, and transaction fees. These calculations enable a clear comparison of the total lifetime cost of each option.

The result of the analysis shows that, in terms of NPV, buying a house strictly dominates renting for both a 15-year period and a 30-year period.
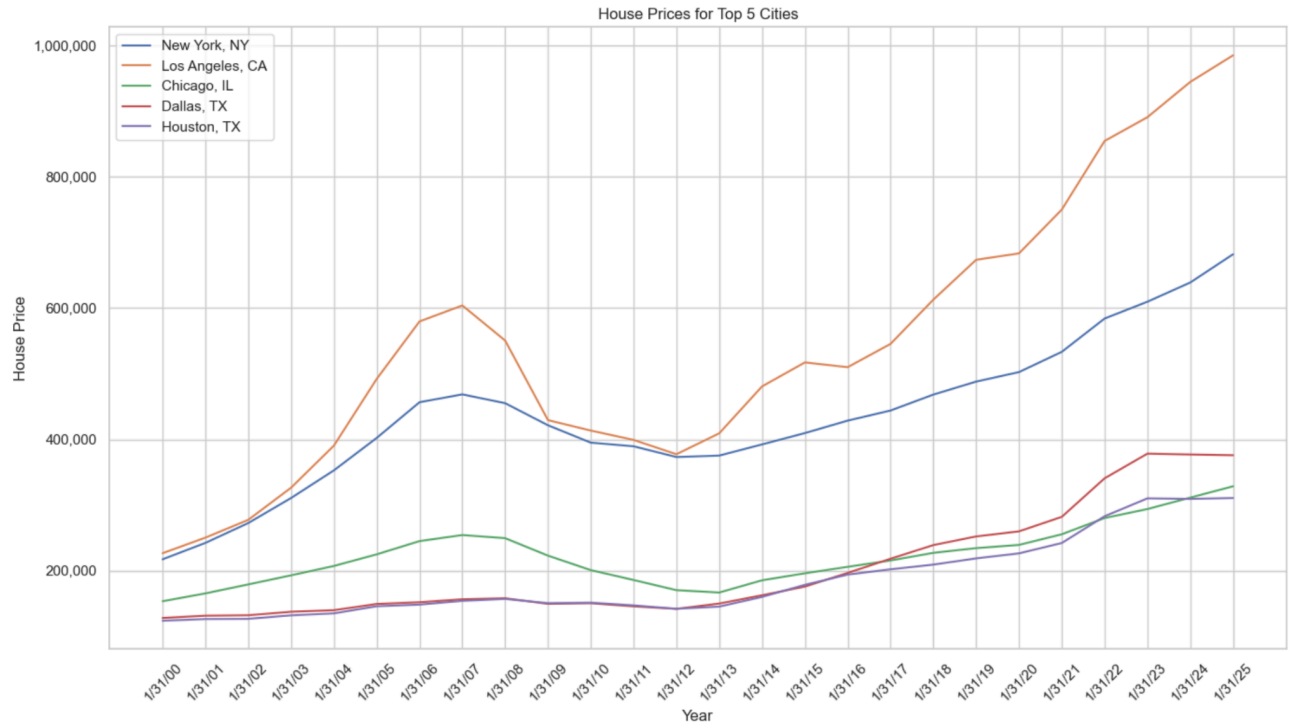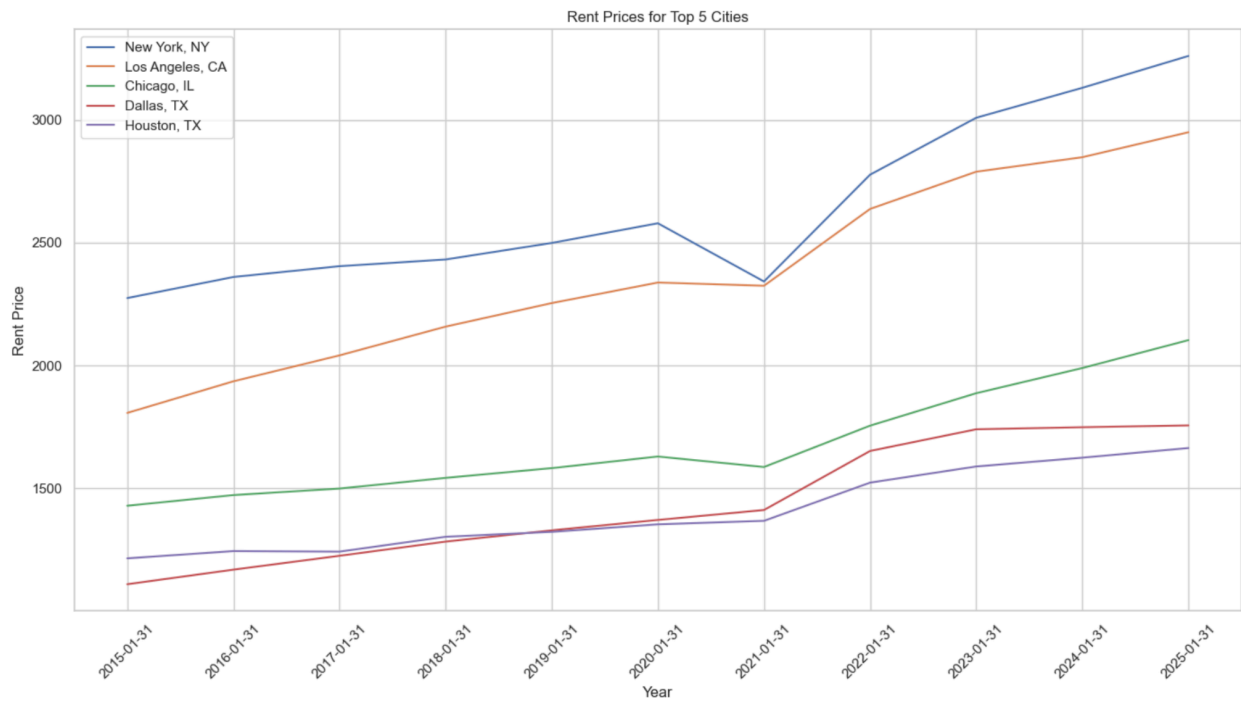
Figure 1

Figure 2

Survey of Previous Study

A 2025 article from Bankrate highlights the increasing financial appeal of renting over buying in today's housing market, especially in major U.S. metros. With the median asking rent dropping to $1,695 which is the lowest level since 2022 and mortgage rates hovering around 7%, the monthly cost of homeownership has significantly outpaced that of renting (McMillin 2025). For instance, a buyer making a 20% down payment on a median-priced home of $402,502 would face monthly mortgage payments of roughly $2,142 which is approximately $450 more than the median rent.

Beyond monthly costs, the article underscores the high upfront expenses of buying, including down payments, closing costs, property taxes, and insurance. In contrast, renters typically only face a security deposit and fixed rent payments. As Bankrate's 2025 Affordability Study confirms, renting is cheaper than buying in all 50 of the largest U.S. metros.

While Bankrate's analysis provides a valuable snapshot of current housing affordability based on present mortgage rates and rental prices, the cost-benefit analysis presented here takes a broader approach by evaluating the full stream of future cash flows associated with buying and renting over a 30-year horizon, using net present value (NPV) to account for long-term costs, inflation, and investment opportunities.

Simplifying Assumptions

The analysis relies on the following simplifying assumptions to ensure consistency and tractability across cities. These assumptions are applied uniformly to standardize cost and return calculations for renting versus buying a home:

For Buyers:

- Down payment: 20% of the purchase price of the house

- Mortgage Rates:

    - 30-year fixed rate: 6.83% (as of April 17, 2025, from FRED database)

    - 15-year fixed rate: 6.03% (as of April 22, 2025, from FRED database)

- Home Insurance and Maintenance Cost: Approximately 1.5% of annual home value

- Transaction Costs:

    - At the time of purchase: 3% of house value (from Zillow)

    - At the time of sale: 8% of house value (from Zillow)

- Property Taxes: The median state property tax rate is applied for each city

For Renters:

- Rental Insurance: 1% of annual rent (from Zillow)

- Rental Inflation: Varies by cities, calculated based on the Compound Annual Growth Rate (CAGR) of rents as elaborated in the next section below.

Data and Methodology

The house prices data is extracted from the Zillow Home Value Index (ZHVI) in the Zillow Housing Data database. This data contains house prices of typical homes in the 35th to

65th percentile range across more than 800 US cities from January 2000 to March 2025. The rent price data is extracted from the Zillow Observed Rent Index also from the Zillow Housing Data database. This data contains rental prices of homes and apartments in the 35th to 65th percentile from January 2015 to March 2025. In this analysis, only the top 50 largest cities are considered, ranked by their population. The median state property tax of 2023 is taken from the Tax Foundation to use as a proxy. To compare renting and buying fairly, this analysis assumes the homeowner sells the property at the end of the period (15 or 30 years), realizing the home's appreciated value. This allows the analysis to include the return on investment from homeownership, which renters do not experience.

To estimate the long-term cost of renting, the author calculated how much a household would spend on rent over 15 and 30 years based on:

- The monthly rent in March 2025.
- The rental inflation rate for each city is based on the city–specific CAGR of rent calculated between 2015 and 2025.
- The cost of renter's insurance, estimated at 1% of annual rent.
- A discount rate of 5% to reflect the time value of money, accounting for that future dollars are worth less than today's dollars.

By combining these factors, this paper estimated the total cost of renting in today's dollars for each city over both timeframes.

The following shows the calculation of the NPV of buying:

- Start with upfront costs:

- ○ A 20% down payment

- ○ Closing costs for the purchase (3% of the home price)

● Calculate annual costs:

- ○ Mortgage payments based on either a 15-year or 30-year fixed interest rate

- ○ Property taxes and home maintenance/insurance (1.5% of the home's value annually)

● Discount all those future annual costs to today's value using a 5% discount rate.

● Estimate the home's value at the end of the time period (15 or 30 years) based on the CAGR of house prices of each city from 2000 to 2025.

- ○ Subtract the transaction cost for selling the home (8%) from the future sale price.

● Convert the final sale proceeds to present-day dollars.

● Total NPV of buying is then:

- ○ All upfront and ongoing costs (negative values)

- ○ Plus the discounted proceeds from selling the house at the end (positive value)

This gives the total cost of buying the home in today's dollars.

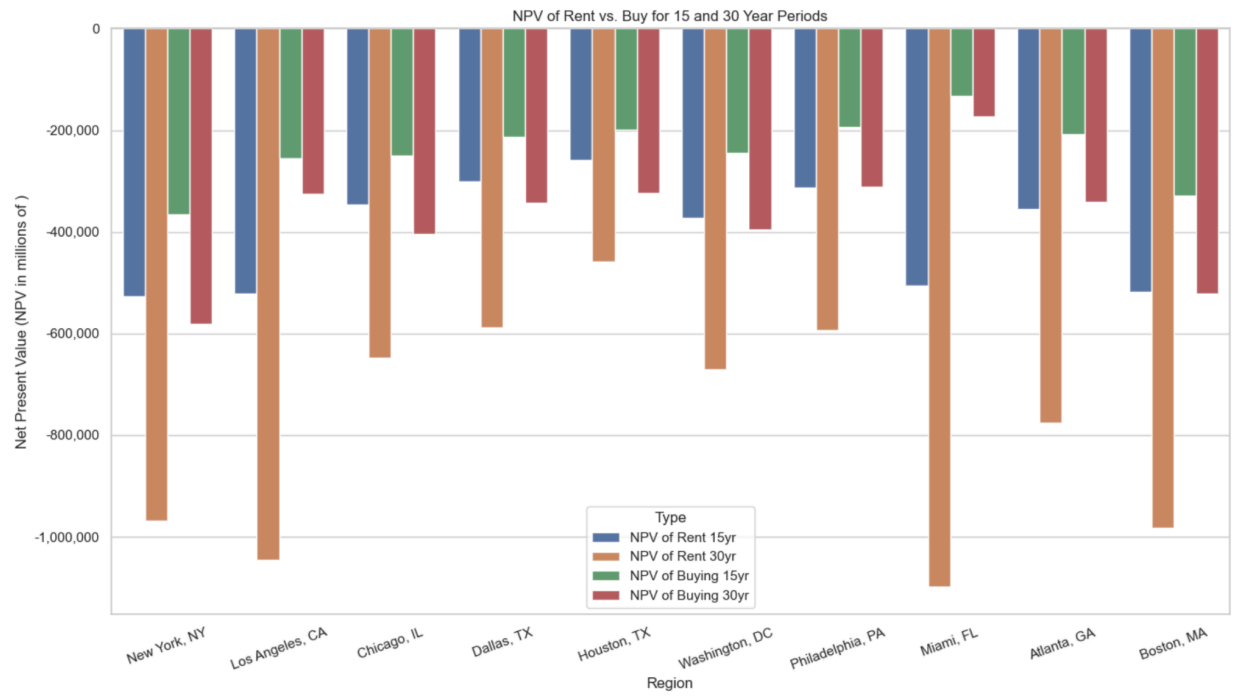# Empirical Results and Interpretation

Figure 3

Figure 3 shows a sample of the calculated dataset; it is cheaper to buy a house whether

for 15 or 30 years because the NPV is less negative across all 10 cities in the figure. In fact, in

the full dataset, it is cheaper in all of the largest 50 cities to buy a house. The NPVs for renting

and buying for all cities are negative signaling that from a pure financial standpoint, both renting

and buying are not a good investment, but buying is better since an individual loses less by

buying. The results only consider the NPV after discounting for all future inflows and outflows

of money but not the timing of these cash flows. Previous studies as mentioned before consider

other factors between the two options. Since the process of finding an apartment to rent is easy:

one finds a listing, fills an application, and gets approved for a unit, some might find it more

appealing to rent. The process of buying a house is much more costly. The closing cost of a

house transaction and the initial down payment and the time commitment needed prevents individuals without enough savings and time from buying a home.

Conclusion

This cost-benefit analysis provides a long-term financial comparison of renting versus buying a home across the 50 largest U.S. housing markets. By focusing solely on the net present value of future costs, the results indicate that buying a home consistently results in lower financial losses than renting, even though both options yield negative NPVs when evaluated purely as investments. This suggests that while neither choice is strictly profitable in financial terms, buying is the economically preferable option over a multi-decade horizon. However, financial outcomes are only part of the decision-making process. Real-world factors such as transaction complexity, liquidity constraints, lifestyle flexibility, and upfront affordability play significant roles in shaping individual choices. For many, the relative ease and lower immediate cost of renting may outweigh long-term financial advantages of ownership—especially in the face of high home prices and mortgage rates. Therefore, while this analysis supports buying as the less costly financial path over time, housing decisions must still account for individual circumstances, preferences, and risk tolerance.

Appendix

The following shows the calculations on NPV of renting and buying in mathematical terms.

Rent

Let:

- $R = monthly\ rent$

- $g = rental\ inflation\ rate\ (CAGR\ of\ Rent)$

- $r = discount\ rate$

- $n = year\ period\ (years:\ 15\ or\ 30)$

- $i = rental\ insurance\ rate\ (1\%)$

Then:

- $Annual\ Rent = 12R$

- $NPVrent = 12R \cdot \dfrac{1-(\frac{1+g}{1+r})^n}{r-g}$

- $NPVrental\ insurance = 12R \cdot i \cdot \dfrac{1-(\frac{1+g}{1+r})^n}{r-g}$

- $NPVtotal\ rent = -(NPVrent + NPVrental\ insurance)$

Buy

Let:

- $P_0 = Home\ price\ (initial\ purchase\ price)$

- $d = Down\ payment\ rate\ (e.\,g.,\ 20\% = 0.20)$

- $t_b = Transaction\ cost\ at\ purchase\ (e.\,g.,\ 3\% = 0.03)$

- $r_m = Mortgage\ rate$

- $n = Loan\ term\ in\ years\ (either\ 15\ or\ 30)$

- $T = Time\ horizon\ (years)$

- $t_s = Transaction\ cost\ at\ sale\ (e.\,g.,\ 8\% = 0.08)$

- $a_h = Home\ appreciation\ rate\ (CAGR\ of\ house\ value)$

- t_p = Annual property tax rate (e.g., 1.6% = 0.016)

- i = Annual insurance and maintenance rate (e.g., 1.5% = 0.015)

- r_d = Discount rate (e.g., 5% = 0.05)

Then:

Initial Cost:

- Initial Down Payment = $d \cdot P_0$

- Transaction Cost at Purchase = $t_b \cdot P_0$

- Loan Amount = L = $(1 - d) \cdot P_0$

Annual Cost:

- Annual Mortgage Payment = M = $12L \dfrac{(1+r_m)^n}{(1+r_m)^n - 1}$

- Annual Property Tax = $t_p \cdot P_0$

- Annual Insurance and Maintenance = $i \cdot P_0$

- Annual Cost = M + Annual Property Tax + Annual Insurance and Maintenance

- NPV Annual Costs = Annual Cost $\cdot \dfrac{1 - (1+r_d)^{-n}}{r_d}$

Terminal Value:

- Future Home Value = $P_0 \cdot (1 + a_h)^n$

- Transaction Cost at Sale = $t_s \cdot$ Future Home Value

- Net Sale Proceeds = Future Home Value − Transaction Cost at Sale

- PV of Sale Proceeds = $\dfrac{\text{Net Sale Proceeds}}{(1+r_d)^n}$

NPV Buy= −Initial Down Payment−Transaction Cost at Purchase−Transaction Cost at

Purchase−NPV of Annual Costs+PV of Sale Proceeds

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