

# **Examining Housing Affordability in the United States**

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## **Introduction**

The ability to buy a home, and the prospective future that comes with it, is a promising goal that many strive for. However, with soaring housing prices and lackluster growth of the average American income, newer generations of homebuyers are becoming increasingly worried about affordability. In this project, I study the growing unaffordability of the housing market in the United States by examining the underlying reasons behind exceptionally fast-growing home pricing that is outpacing the income capabilities of Americans.

As part of my analysis, I examine the effects of inflation on housing pricing and the cost to build homes. I also study the state of the housing market by focusing in on the current and past housing supply. My results showed that shrinking housing supply and higher construction costs are the main causes of exceptionally increasing housing prices.

## **Data and Methodology**

To conduct this study, I utilized datasets from the Federal Reserve Bank of St. Louis (FRED) [1] and Realtor.com's residential database on housing [2]. From FRED I looked at data for the median sales price of houses sold, median household income, active housing inventory of the entire U.S as a country, and producer price indexes for construction materials and all commodities. Using Realtor.com I examined historical statistics on the inventory of the housing market for each U.S. state.

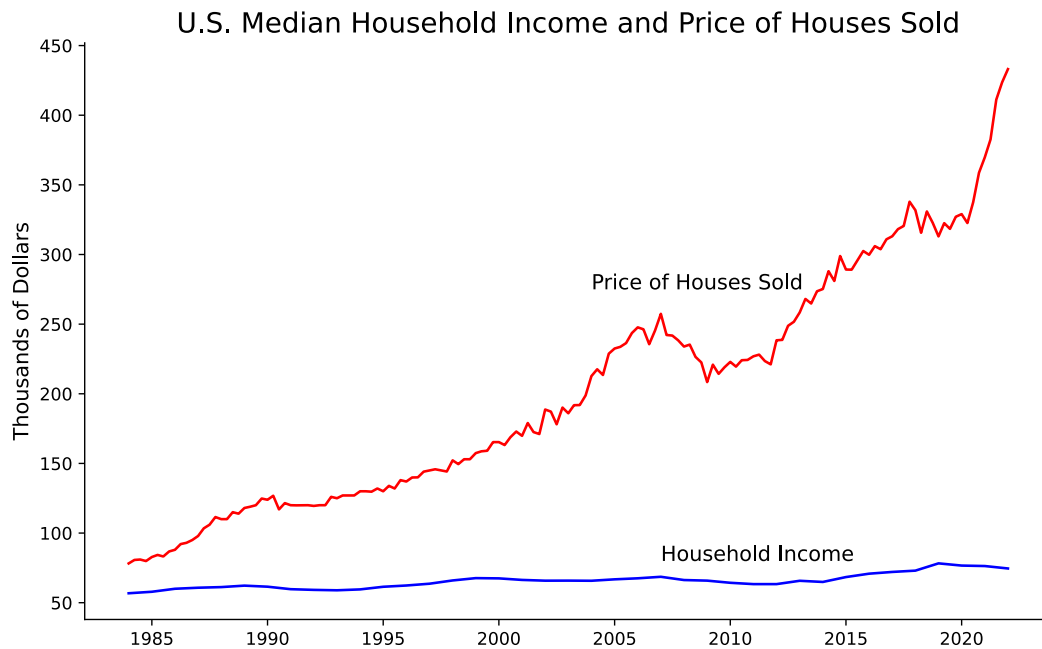
The first step in my method to utilize these datasets was to examine which trends involving inflation and housing supply shared interesting negative and positive correlations. I created line plots, bar graphs, and choropleth maps based on these trends. Building from these correlations, I analyzed the most notable relationships as linear regressions to discuss the impacts these trends have on each other and ultimately housing prices.

## **Analysis**

### **Disparity Between Home Price and Income**

Beginning my analysis, I plotted the changes in median household income and the price of houses sold over nearly the past 40 years. Figure 1 shows quite a shocking disparity between the two trends. Between 1985 and 2020 the average sale of homes grew 289.6% while income grew a mere 32.5% in comparison. This led my research to dive into the underlying reasonings for this exceptionally large growth in housing prices.

Figure 1



### Active Housing Available in the Market

To inspect the huge growth in the cost of home purchases I decided to look at the state of the housing market. Since supply has a big impact on pricing, the most important concept I wanted to consider was the supply of houses in the market. Figures 2 and 3 show the supply of homes per state across the U.S. in 2016 and 2023 respectively. These maps displayed a noticeable decline in the number of houses available in the market across the entirety of the United States. From 2016 to 2023 the overall number of houses actively for sale decreased by more than half, losing roughly 700,000 homes.

Figure 2

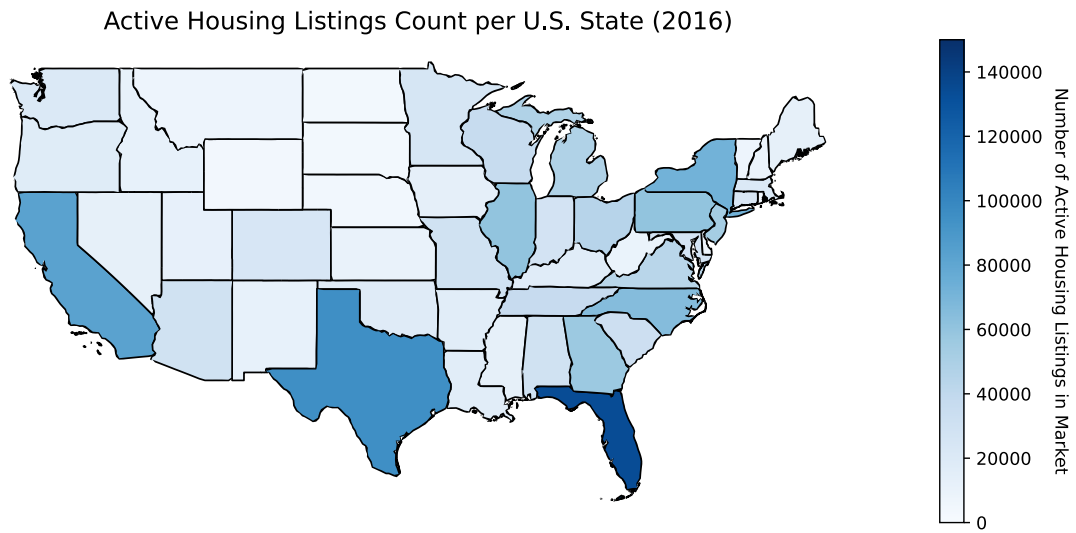
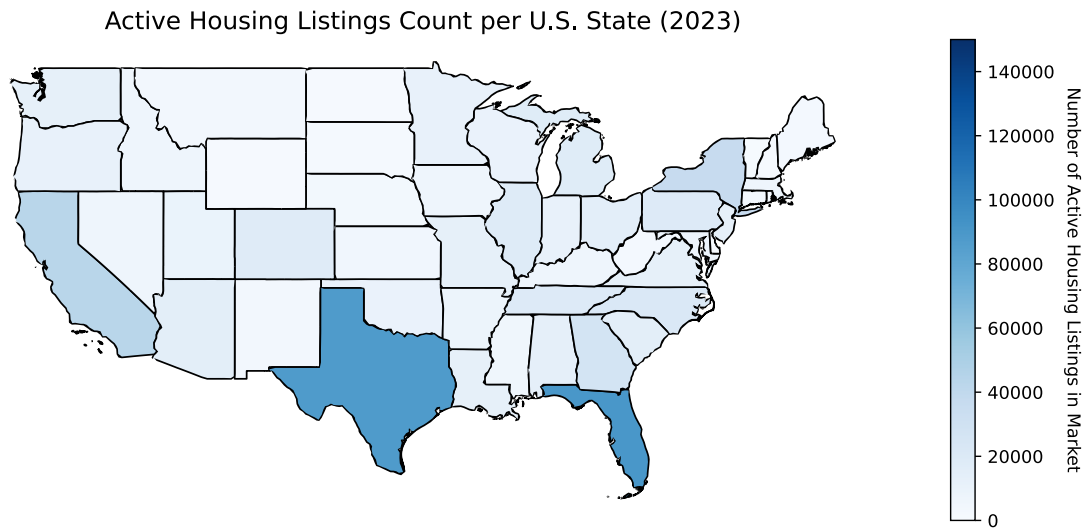


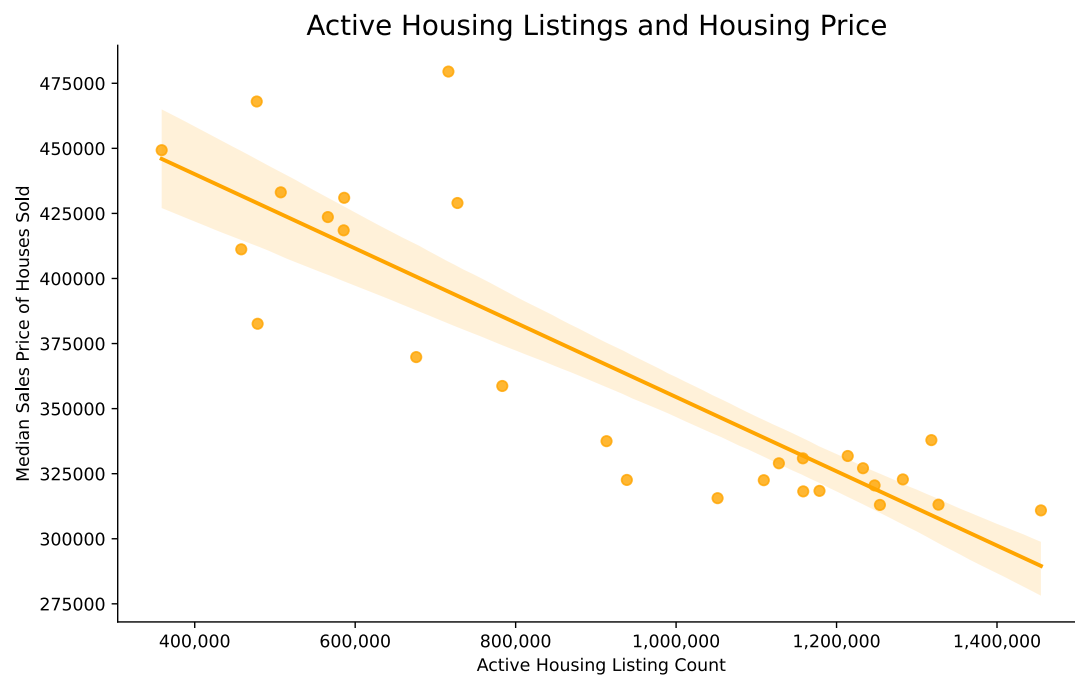
Figure 3



## The Effect of Housing Supply on Market Pricing

The decrease in housing supply pushed me to examine how much it was harming the pricing of homes. Figure 4 runs a linear regression that shows my results of the impact housing supply has on costs. I was able to conclude with this data that the growth of housing supply has a strong negative correlation to the pricing of homes. The exceptionally high pricing of today's market is in large part influenced by the lack of homes for sale.

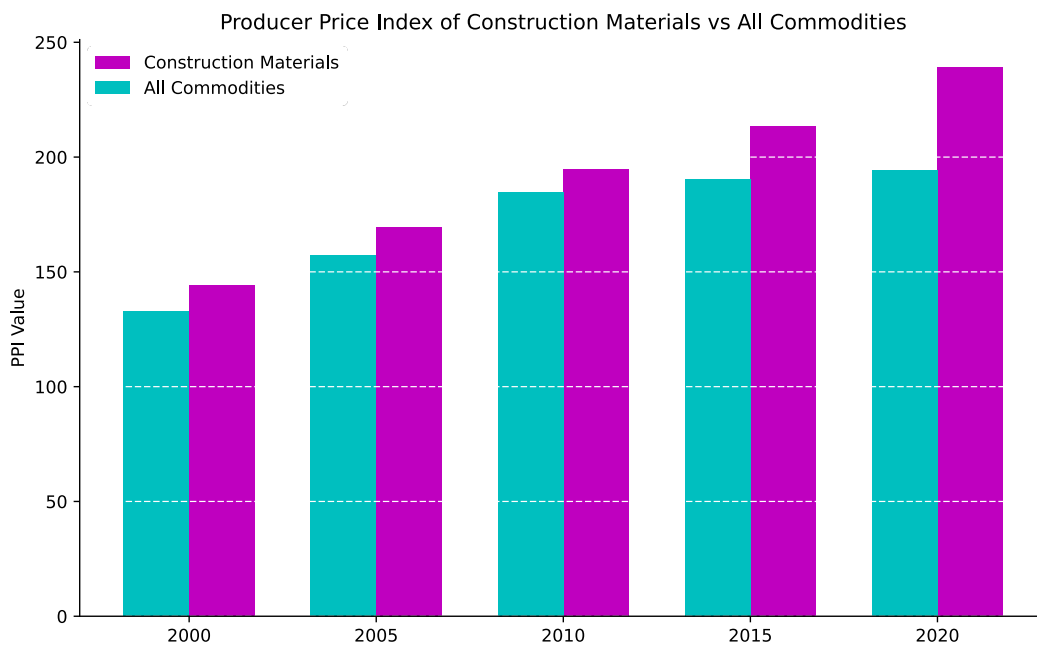
Figure 4



## Inflation of Housing Construction Materials

With the declining supply of houses in mind, I opted to examine inflation trends within production to see if increasing prices were affecting not only the number of houses available, but inevitably the drastic pricing of homes. I began by examining the trends of the producer price index for construction materials over the past 20 years. To give the changes in PPI for construction materials some context, Figure 5 shows construction costs side-by-side with the overall costs of all commodities. I discovered that even though both groups were experiencing inflationary growth, the Producer Price Index of construction materials is outpacing its overall commodities counterpart. Extreme housing prices and supply shortages are likely a product of producers trying to match high construction costs in an already inflation filled economy.

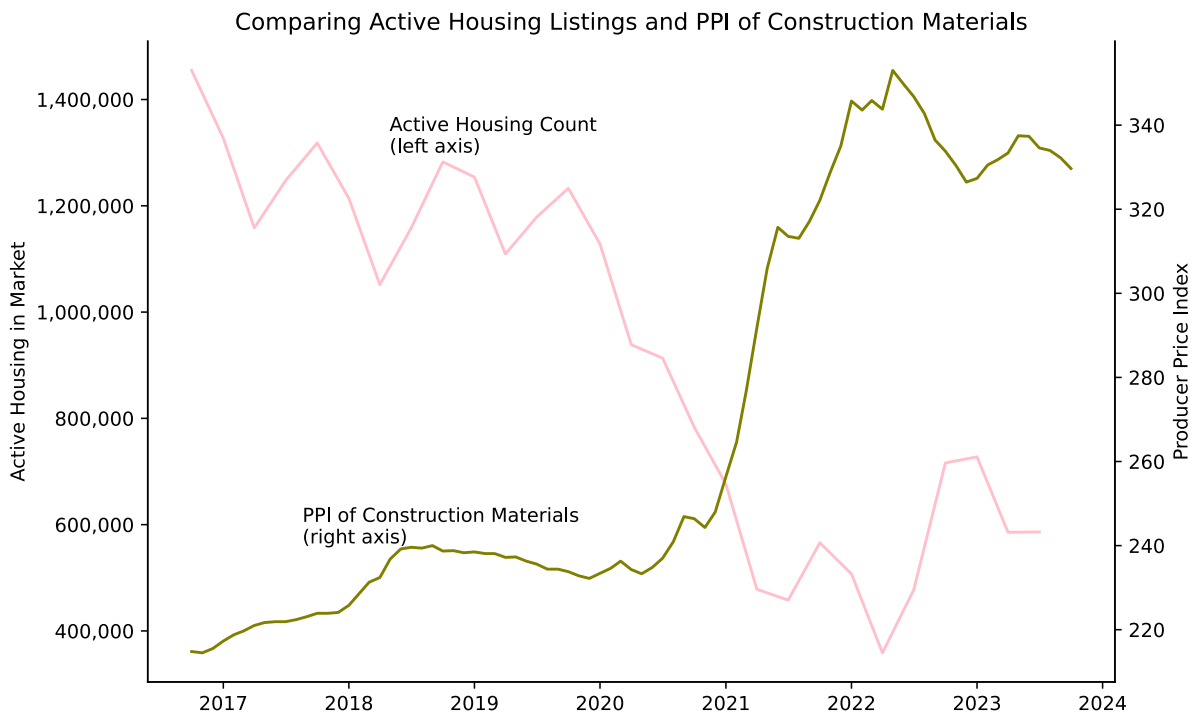
Figure 5



## Impact of Construction Cost on Housing Market Supply and Pricing

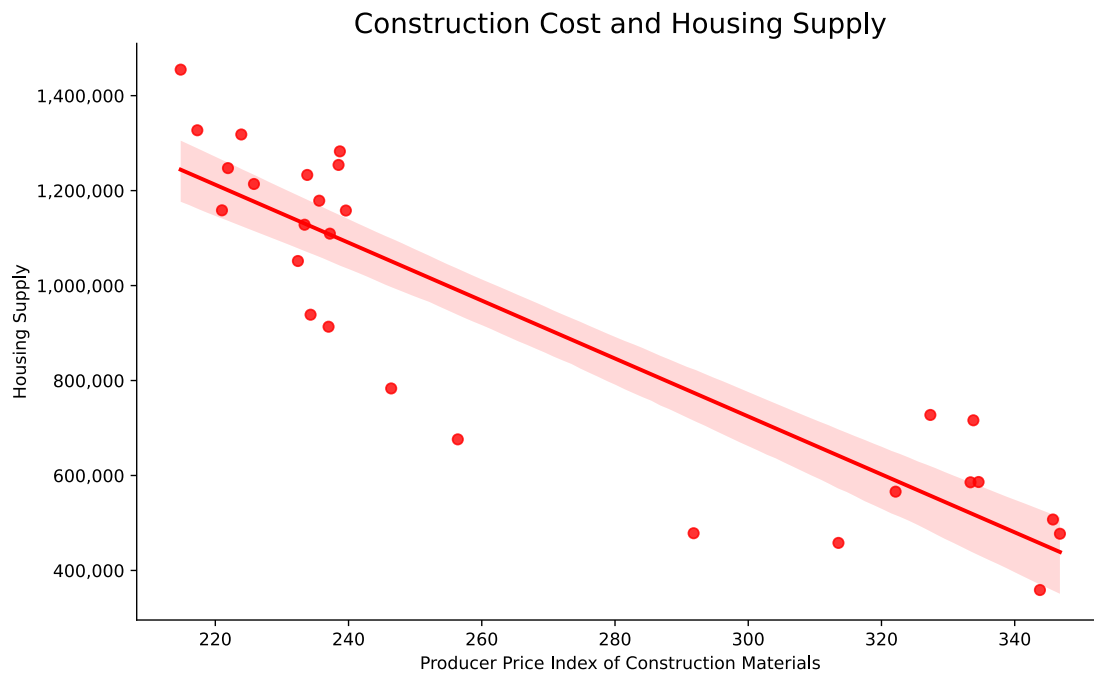
After understanding the higher inflation seen in construction costs and its potential to impact the housing supply, I examined the changes in both trends together. Figure 6 shows that as the Producer Price Index of Construction Materials has increased the count of active housing in the market has decreased.

Figure 6



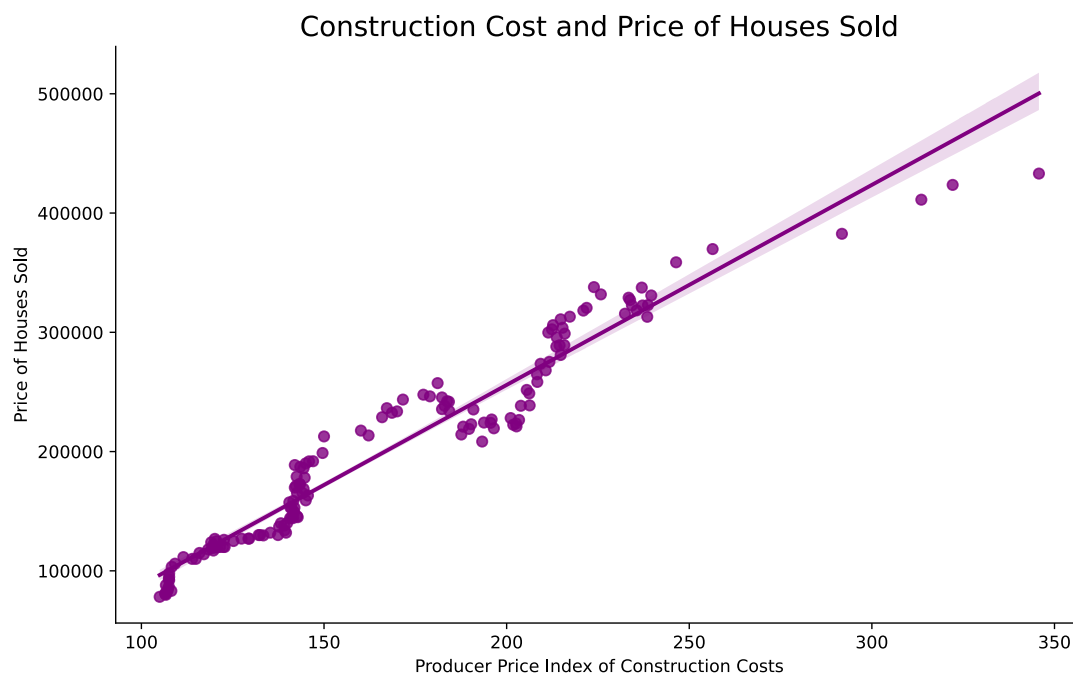
Although the inflation of construction materials and the supply of houses in the market have an inverse relationship, I dove further into the data to see if the inflation of construction materials was in fact impacting the supply of houses. Figure 7 runs a linear regression that shows that there is a strong negative correlation between inflation of construction materials and housing supply.

Figure 7



After recognizing the correlation between inflation of construction materials and the housing supply, I wanted to move forward by analyzing the PPI of construction materials with the increasing cost of homes. Figure 8's regression plot demonstrates an extremely positive correlation between the two.

Figure 8



The regressions in Figures 7 and 8 show how impactful construction costs are on the housing prices of the current market today. Increasing construction costs are not only impacting housing prices but also the supply of the housing market, which in turn, is also building into the increased cost to buy a home.

### **Conclusions and Directions for Future Research**

After my research and analysis, I learned that housing affordability in the U.S. is a nuanced subject due to all the interwoven connections potential causes have with one another. My main conclusion is that increased inflation for construction materials coupled with a declining housing supply are main contributors to excessive housing prices outcompeting income capabilities of Americans.

Future research that could build upon my findings are analysis of trends related to household income. My study largely focused on the production and supply side of the housing market, but a look into the consumer perspective could bring new notions to light. Additionally, an interesting further study would be how the disparity in housing prices and income is changing the economic habits of people as they adapt to the market. The response to current trends is just as important as the causations discussed in this research.



## References

[1] Federal Reserve Bank of St. Louis

Median Sales Price of Houses Sold for the United States

<https://fred.stlouisfed.org/series/MSPUS>

Real Median Household Income in the United States

<https://fred.stlouisfed.org/series/MEHOINUSA672N>

Housing Inventory: Active Listing Count in the United States

<https://fred.stlouisfed.org/series/ACTLISCOUUS>

Producer Price Index by Commodity: Special Indexes: Construction Materials

<https://fred.stlouisfed.org/series/WPUSI012011>

Producer Price Index by Commodity: All Commodities

<https://fred.stlouisfed.org/series/PPIACO>

[2] Realtor.com

Historical Residential Data of Housing Inventory per State

<https://www.realtor.com/research/data/>