Home-LLC-Assignment

Task - Using publically available data for the national factors that impact supply and demand of homes in US, build a model to study the effect of these variables on home prices.

Factor Influencing the US House Prices: -

1. **Unemployment:**

   When more people don't have jobs (high unemployment), they're less likely to buy houses. This means there are fewer people looking to buy homes. When there are fewer buyers, sellers might lower their prices to attract someone to buy their houses. So, high unemployment can often lead to fewer people buying homes, which can cause house prices to go down.

2. **Total Construction Spending**

   Supply of Homes: When there's more construction spending on building new houses, it can increase the supply of homes available in the market. If there are a lot of new homes being built, it might lead to more options for buyers. An increase in supply without a corresponding increase in demand could put pressure on prices to go down.
   Economic Growth: Higher construction spending can indicate a growing economy. When the economy is doing well, people may have more confidence and money to buy homes. This increased demand can sometimes push prices higher.
   Construction Costs: If the cost of construction materials or labor goes up due to increased spending in the construction sector, it might make building new houses more expensive. Builders might then pass these higher costs onto buyers, potentially increasing house price

3. **New Privately-Owned Housing Units**

   More new houses being built means there are more homes available for people to buy or rent. When there's a lot of new housing available, it can give buyers or renters more options. If there are too many new houses compared to the number of people wanting to buy or rent, sellers might lower prices to attract buyers or renters. So, when there are a bunch of new homes, it can sometimes lead to lower house prices because there's more competition among sellers.

4. **NASDAQ Composite Index Units**

   The NASDAQ Composite Index measures the performance of thousands of stocks traded on the NASDAQ stock exchange. When the index goes up, it generally means that the stock market is doing well. When people see the stock market doing well, they might feel more confident about their finances and the economy. This increased confidence can sometimes encourage people to spend more, including buying homes.

5. **house prices in simple word**

The "MSACSR" stands for the Monthly Supply of New Houses at a specific time. This metric measures how long it would take to sell all the newly constructed homes at the current sales pace if no new homes were built.

In simple terms, the Monthly Supply of New Houses can impact house prices like this:

Low Supply: If the supply of newly built houses is low compared to the number of buyers looking for homes, it can create competition among buyers. This competition might lead to higher prices because buyers may be willing to pay more to secure a home in a limited market.

High Supply: Conversely, if there's a high supply of new houses and fewer buyers, it can create less competition among buyers. Sellers might then lower prices to attract buyers, resulting in potentially lower house prices.

6. **Active Population: Aged 15 and over**

Employment and Income: When more people in the active population have jobs and steady income, it can lead to increased demand for houses. More employed people might feel confident about buying homes, which can push prices up due to higher demand.

Economic Growth: A larger active population with more people employed often signifies a healthier economy. A strong economy may attract more people to buy homes, potentially increasing competition among buyers and driving prices higher.

Local Housing Demand: In areas where the active population is growing due to job opportunities or population growth, there might be increased demand for housing. This demand can impact prices, especially if the available housing supply doesn't keep up with the growing population's needs.

7. **New One Family Houses Sold**

When more new single-family houses are sold, it usually means there's higher demand for these types of homes. If lots of people want to buy these houses and there aren't enough available, sellers might raise prices because buyers are competing for fewer houses. So, when more new single-family houses are sold, it can often lead to higher house prices.

8. **New One Family Homes for Sale**

Increased Supply: If there's a higher number of new single-family homes for sale compared to the number of people looking to buy homes, it means there's more choice for buyers. When there's an excess supply of houses and fewer buyers, sellers might lower prices to attract buyers. This situation of more houses for sale than buyers can lead to lower house prices.

Market Balance: If the number of new single-family homes for sale matches the demand from buyers, it might not have a significant impact on prices. A balanced market, where supply meets demand, usually keeps prices relatively stable.

9. Labour Force Participation Rate

Economic Strength: When the Labor Force Participation Rate is high, it usually indicates a healthier economy with more people working or seeking employment. A strong economy can lead to higher wages and increased consumer confidence. This confidence might encourage more people to buy homes, potentially increasing demand and pushing prices up.

Demand for Housing: If more people are actively participating in the labor force, they might be more inclined to buy homes or upgrade to larger ones due to increased income stability. This increased demand for housing can contribute to higher prices, especially if the available supply of houses doesn't keep pace with the demand.

Regional Impact: The influence of the Labor Force Participation Rate on house prices can vary by region. In areas where job opportunities are abundant and participation in the labor force is high, it can create stronger demand for housing, potentially impacting prices more significantly

10. New Housing Project

Supply of Homes: A new housing project increases the number of homes available in the market. If the number of new homes is substantial and exceeds the demand for houses in that area, it might lead to an oversupply. When there's more supply than demand, sellers might reduce prices to attract buyers, which can result in lower house prices.

Location and Demand: If the new housing project is in a high-demand area where people want to live, it might attract buyers quickly. Limited availability or high demand in that location could drive prices up due to increased competition among buyers.

Impact on Existing Homes: Sometimes, a new housing project might affect the prices of existing homes nearby. If the new houses offer similar features and are priced competitively, it could put pressure on the prices of older homes in the vicinity, possibly leading sellers to adjust their prices.

11. Industrial Production: Cement

Construction Costs: Cement is a crucial material in building homes. If the production of cement increases and its price goes up due to high demand or limited supply, it can make building houses more expensive. These increased construction costs may lead to higher house prices as builders may raise prices to cover the increased expenses.

Housing Availability: Changes in cement production might impact the number of new homes constructed. If cement production rises, more homes could be built. This might influence the availability of houses in the market. If there's a significant increase in available houses and demand doesn't keep pace, it might put downward pressure on prices.

12. employment rate

Economic Confidence: When more people have jobs and the employment rate is high, it often signals a strong economy. People feel more secure about their jobs and income, making them more likely to buy homes. Increased demand for houses can drive prices up because more people are competing to buy homes.

Affordability: Higher employment rates mean more people have steady incomes. This can lead to more people being able to afford homes, especially if they've been saving or feel financially secure. With more potential buyers able to afford homes, sellers might raise prices due to increased demand.

Market Stability: A stable or rising employment rate generally contributes to a stable housing market. When people are employed and confident in their financial situations, they're more likely to invest in homes, which can support steady or increasing house prices.

13. Personal Income & Outlays

Affordability: When personal income increases, people might have more money available for buying homes. Higher incomes can make it easier for individuals to afford mortgage payments, leading to increased demand for homes. This increased demand might push house prices up as buyers compete for available properties.

Consumer Spending: When people have higher incomes, they might be more inclined to spend on big purchases like homes. Increased spending on housing can drive up demand, potentially leading to higher house prices due to increased competition among buyers.

Market Stability: Personal income stability and spending patterns can impact the overall stability of the housing market. When incomes are steady and people are spending, it can support a healthy housing market with stable or increasing prices. Conversely, a decrease in income or reduced spending might signal economic uncertainty, potentially affecting housing market stability.

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Following sources were used to gather data -

1. UNRATE: Unemployment Rate Units: Percent,Seasonally Adjusted
   Frequency: Monthly Source: https://fred.stlouisfed.org/series/UNRATE

2. CSUSHPISA: S&P/Case-Shiller U.S. National Home Price Index Units: Index Jan 2000=100,Seasonally Adjusted
   Frequency: Monthly Source: https://fred.stlouisfed.org/series/CSUSHPISA

3. PERMIT: New Privately-Owned Housing Units Authorized in Permit-Issuing Places: Total Units Units: Thousands of Units,Seasonally Adjusted Annual Rate
   Frequency: Monthly Source: https://fred.stlouisfed.org/series/PERMIT

4. PERMIT1: New Privately-Owned Housing Units Authorized in Permit-Issuing Places: Single-Family Units Units: Thousands of Units,Seasonally Adjusted Annual Rate
   Frequency: Monthly Source: https://fred.stlouisfed.org/series/PERMIT1

5. MSACSR: Monthly Supply of New Houses in the United States Units: Months' Supply,Seasonally Adjusted
   Frequency: Monthly Source: https://fred.stlouisfed.org/series/MSACSR

6. TTLCONS: Total Construction Spending: Total Construction in the United States Units: Millions of Dollars,Seasonally Adjusted Annual Rate
   Frequency: Monthly Source: https://fred.stlouisfed.org/series/TTLCONS

7. NASDAQCOM: NASDAQ Composite Index Units: Index Feb 5, 1971=100,Not Seasonally Adjusted
   Frequency: Daily, Close Source: https://fred.stlouisfed.org/series/NASDAQCOM

8. LFACTTTTUSM657S: Active Population: Aged 15 and over: All Persons for United States Units: Growth rate previous period,Seasonally Adjusted
   Frequency: Monthly
   Source: https://fred.stlouisfed.org/series/LFACTTTTUSM657S

9. HSN1F: New One Family Houses Sold: United States Units: Thousands,Seasonally Adjusted Annual Rate
   Frequency: Monthly Source: https://fred.stlouisfed.org/series/HSN1F

10. HOUST1F: New Privately-Owned Housing Units Started: Single-Family Units Units: Thousands of Units,Seasonally Adjusted Annual Rate
    Frequency: Monthly Source: https://fred.stlouisfed.org/series/HOUST1F

11. The Labor Force Participation Rate (LFPR)
    https://pib.gov.in/PressReleaseIframePage.aspx?PRID=1966154

12. Housing starts (New Housing Project) https://towardsdatascience.com/linear-regression-on-housing-csv-data-kaggle-10b0edc550ed
13. Industrial Production: Cement (The industrial production (IP) index measures the real output of all relevant establishments located in the United States) https://fred.stlouisfed.org/series/INDPRO/
14. Personal Income & Outlays csv https://alfred.stlouisfed.org/release?rid=54
15. New Privately-Owned Housing Units Completed: Total Units https://fred.stlouisfed.org/series/computsa
16. Employment rate https://www.kaggle.com/datasets/akash14/house-price-dataset