



REEF REPORT

REAL ESTATE & ECONOMIC FORECAST

UNITED STATES

SUMMARY

Macroeconomic Environment

The economic landscape presents mixed signals as we close 2024. The unemployment rate has risen to 4.2% (+13.51% YoY), indicating a cooling labor market, while Core PCE inflation persists at 2.8% YoY. Industrial production shows signs of contraction, declining to 102.28 (-0.29% YoY), and private sector quit rates have decreased 8.83% YoY, suggesting diminishing worker confidence. The Federal Reserve's recent pivot to monetary easing, with three consecutive rate cuts bringing the federal funds rate to 4.25%-4.5%, marks a significant shift in policy stance, though the impact on mortgage markets remains limited.

Housing Market Conditions

Housing affordability continues to face significant pressures despite recent market adjustments. Mortgage rates, while down 5.68% YoY, remain elevated at 6.81%, creating substantial lock-in effects for existing homeowners. Our Fair Value Variable indicates housing remains 15.2% overvalued based on historical affordability measures. The nominal monthly mortgage payment of \$2,195 now consumes 30.3% of median household income, representing a 42.5% increase above five-year averages. New single-family home sales have declined 9.36% YoY to 610,000 units, reflecting persistent affordability challenges despite strong demographic demand from millennial household formation.

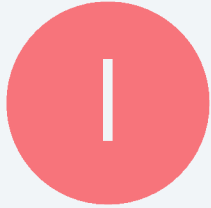
Supply and Construction Dynamics

A notable divergence has emerged in housing supply metrics, with new home inventory expanding to 9.5 months (+20.25% YoY) while existing home supply remains tight at 4.2 months. Construction activity shows similar contradictions: while the Real Residential Construction Spend Index increased 5.65% YoY to 110.31, construction job openings have plummeted 39.71% YoY. The widening spread between housing starts and completions indicates builders are prioritizing existing project completion over new initiatives, suggesting growing caution about market conditions.

Market Outlook and Risks

The housing market faces continued headwinds from elevated mortgage rates and affordability constraints, despite the Fed's shift toward monetary easing. The persistent overvaluation suggests further market adjustment may be necessary, either through price moderation, income growth, or additional rate reductions. While demographic demand remains strong, the current affordability challenges and builder caution point to potential continued pressure on transaction volumes and construction activity through 2025. The dramatic decline in construction job openings may signal upcoming adjustments in building activity, particularly if market conditions don't improve.

KEY DEVELOPMENTS



Federal Reserve Signals Policy Shift with Third Consecutive Rate Cut

The Federal Reserve's December meeting marked a decisive turn in monetary policy with its third consecutive rate cut, bringing the federal funds rate down to 4.25%-4.5%. This shift represents a significant departure from the Fed's previous inflation-fighting stance toward a more balanced approach. While this policy adjustment reflects growing confidence in inflation control, with Core PCE at 2.8%, the transmission to mortgage markets remains limited. Mortgage rates, while down 5.68% year-over-year, persist at elevated levels around 6.81%, continuing to constrain housing market liquidity and affordability.



Construction Industry Signals Growing Caution Despite Current Activity

A striking divergence has emerged in construction market indicators, pointing to potential industry retrenchment ahead. While current construction employment grew 2.81% year-over-year and the Real Residential Construction Spend Index rose 5.65%, job openings have plummeted by 39.71% to 249,000 positions. This dramatic decline in openings, coupled with a widening spread between housing starts and completions, suggests builders are adopting an increasingly defensive posture. The contradiction between current activity levels and forward-looking indicators may presage significant adjustments in construction activity through 2025 unless market conditions improve.



Housing Supply Shows Unusual Bifurcation Between New and Existing Markets

The housing market is experiencing an unprecedented divergence in supply dynamics between new and existing homes. New home supply has expanded significantly to 9.5 months (+20.25% YoY), while existing home supply, though slightly elevated at 4.2 months, remains relatively constrained compared to historical norms. This bifurcation reflects the impact of rate lock-in effects on existing homeowners, who remain reluctant to list their properties and forfeit low-rate mortgages. Meanwhile, builders face growing inventory challenges despite production adjustments, creating a complex market environment where overall supply remains tight despite building inventories in the new home sector.

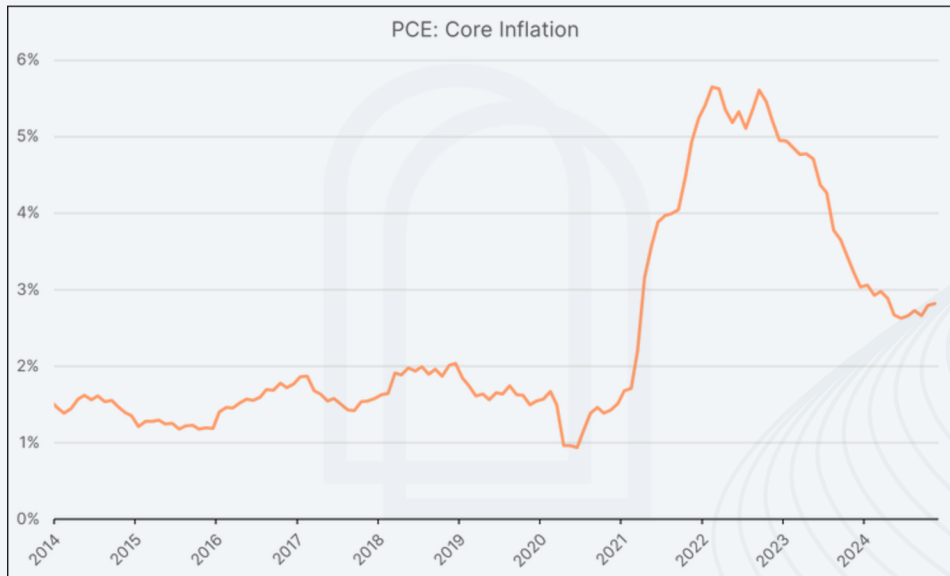


MACRO CONTEXT

UNEMPLOYMENT AND INFLATION



Source: U.S Bureau of Labor Statistics



Source: U.S. Bureau of Economic Analysis

The unemployment rate increased to 4.2% (+13.51% YoY) in November, representing a shift in labor market dynamics. This uptick suggests employers are becoming more cautious with hiring, potentially responding to broader economic uncertainty. Simultaneously, Core PCE inflation rose 5.39% month-over-month to 2.8% YoY in October.

The combination of rising unemployment and persistent inflation creates a challenging environment for housing market participants. As wage growth potentially moderates due to softer labor conditions, housing affordability could face additional pressure despite recent price adjustments. This dynamic particularly impacts first-time homebuyers who rely heavily on wage income for down payments and monthly payments.

INDUSTRIAL PRODUCTION INDEX

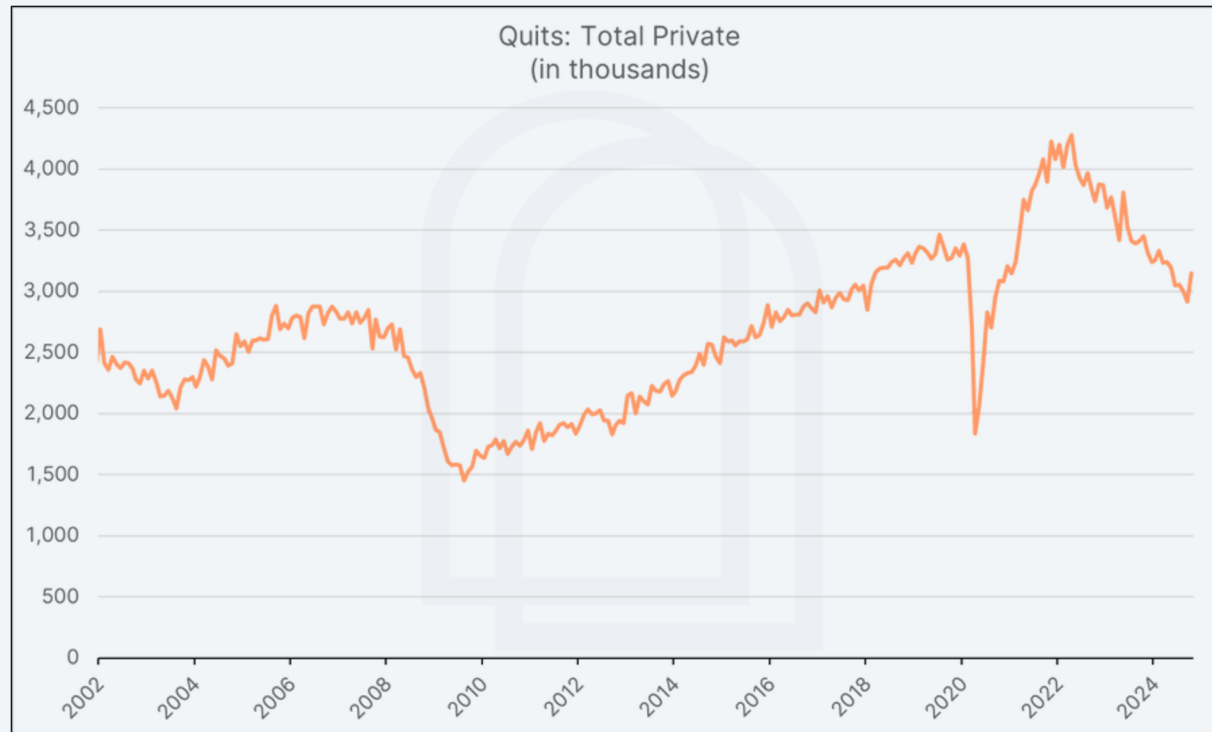


Source: Freddie Mac

The industrial production index declined to 102.28 (-0.29% YoY) in October, indicating modest economic contraction in manufacturing and industrial output. While the decline appears minor, the directional shift is notable given the index's role as a broad economic indicator.

This cooling in industrial activity often precedes shifts in employment and wage growth, both critical factors for housing market health. The current reading suggests businesses may be adopting more conservative production strategies, which could signal broader economic caution.

QUITS: TOTAL PRIVATE



Source: Freddie Mac

Private sector quits decreased 8.83% YoY to 3,148,000 despite a monthly uptick in October. This declining trend in voluntary separations represents a significant shift in worker confidence compared to the robust job-switching environment of recent years. The quit rate serves as a key indicator of labor market confidence and wage growth potential, as workers typically quit when confident in finding higher-paying opportunities.

The current decline suggests employees are becoming more risk-averse, potentially impacting household formation rates and housing demand. This metric's movement also correlates with consumer confidence in making major purchases, including homes.

NOMINAL MORTGAGE RATES



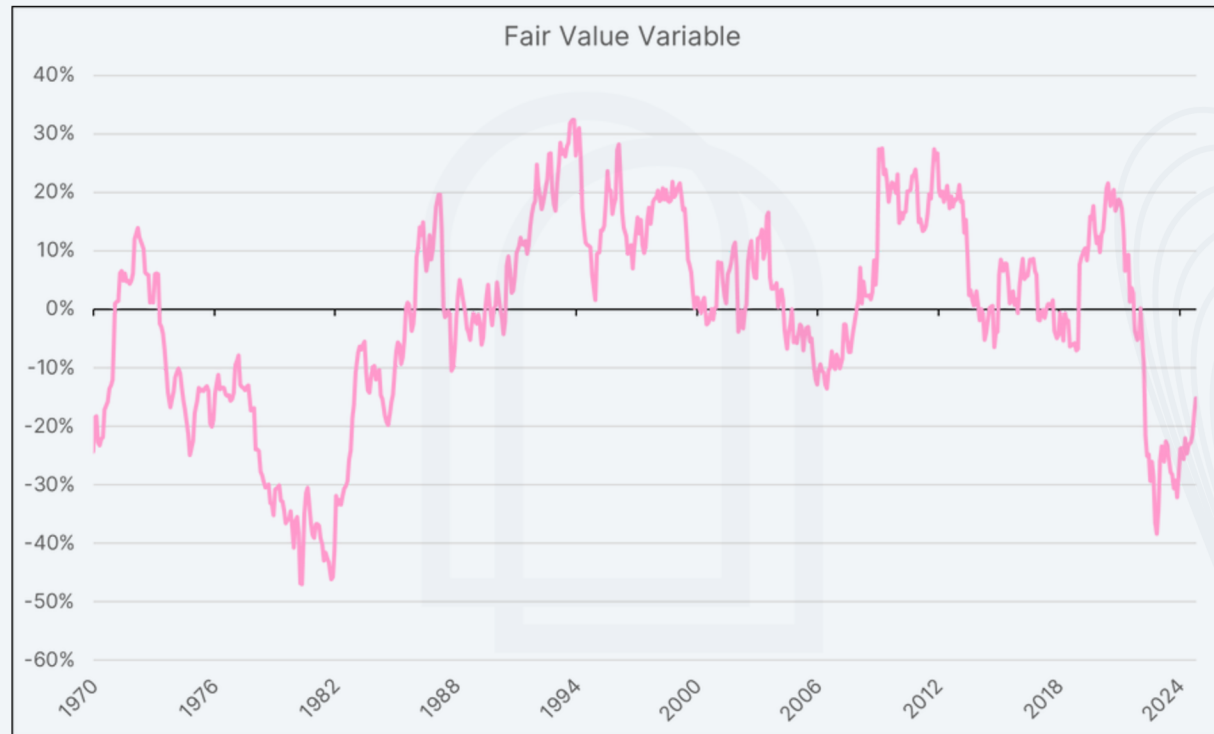
Mortgage rates climbed to 6.81% in December, though down 5.68% YoY from 2023's peaks. This rate environment continues to create significant "lock-in" effects, where existing homeowners with low-rate mortgages resist selling and taking on higher-rate loans. The current rate level suppresses both buying power and refinancing opportunities, fundamentally altering market dynamics.

To put this into perspective, a buyer with a \$2,500 monthly payment budget could afford roughly \$165,000 less in home value compared to when interest rates were at 4%. This rate environment particularly impacts first-time buyers who lack existing home equity, while simultaneously discouraging current homeowners from listing their properties, creating a compound effect on market liquidity.

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HOUSING MARKET

FAIR VALUE VARIABLE (FVV)



Source: Reef Insights LLC

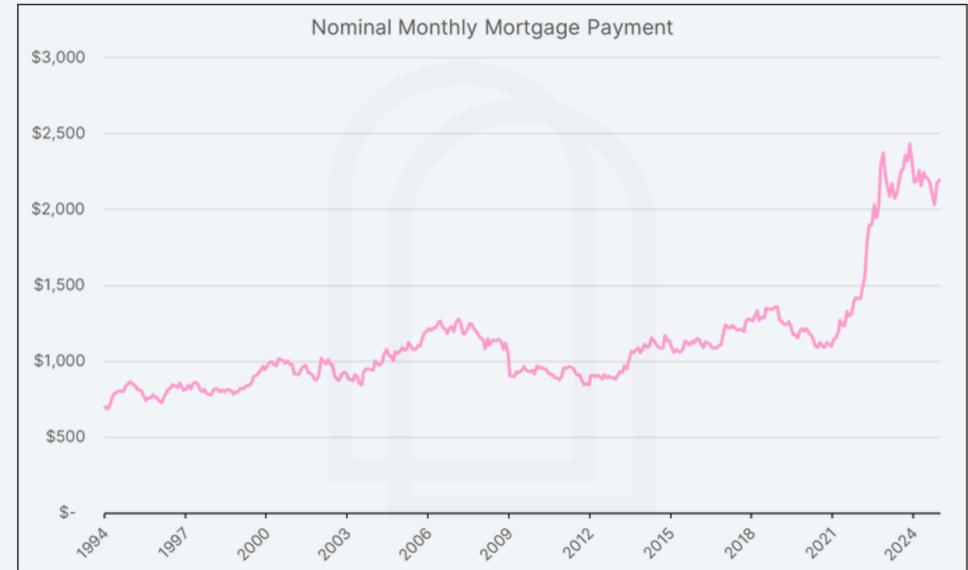
Our Fair Value Variable indicates housing remains 15.2% overvalued based on historical affordability measures. This metric synthesizes three rolling averages (5, 10, and 15 years) of the percentage of median household income spent on annual mortgage payments. The current overvaluation suggests prices need significant adjustment to align with historical norms, either through price declines, income growth, or rate reductions.

This misalignment between current prices and fundamental value helps explain both the recent pullback in transaction volume and builder caution. The persistence of this overvaluation despite recent market adjustments suggests structural factors, including supply constraints and demographic demand, may be creating a "new normal" for housing valuations.

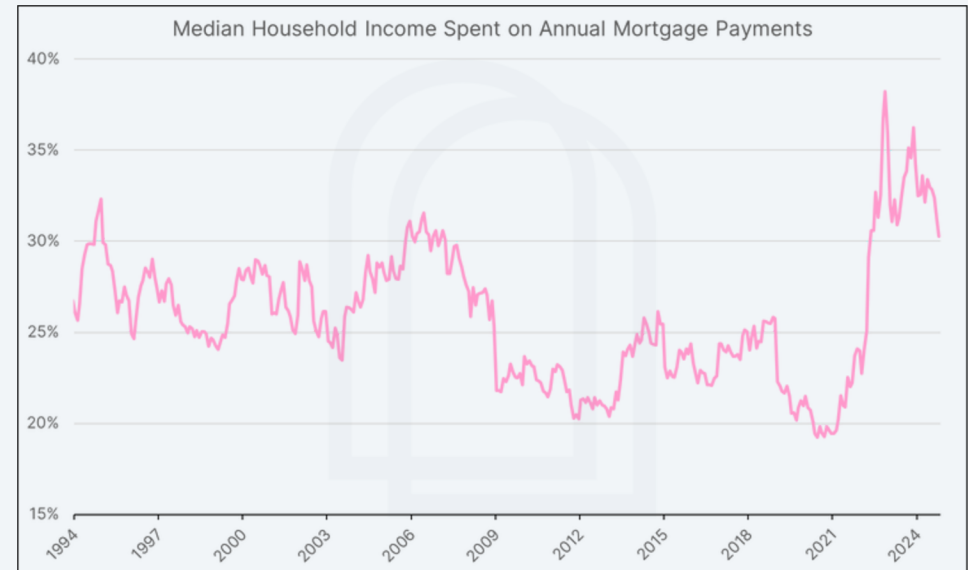
HOUSING COSTS

The nominal monthly mortgage payment stands at \$2,195 (-4.69% YoY but +80.28% over five years), assuming a 20% down payment and 30-year fixed mortgage. More critically, the portion of median household income required for mortgage payments has reached 30.3%, down YoY but still 42.5% above five-year averages. This metric reveals the true impact of recent years' price appreciation and rate increases on affordability.

The dramatic five-year change highlights a potential structural shift in housing costs relative to incomes. Current payment-to-income ratios exceed levels historically associated with sustainable housing market growth, suggesting continued pressure on transaction volumes and new construction demand until better alignment is achieved through price adjustments, income growth, or rate normalization.

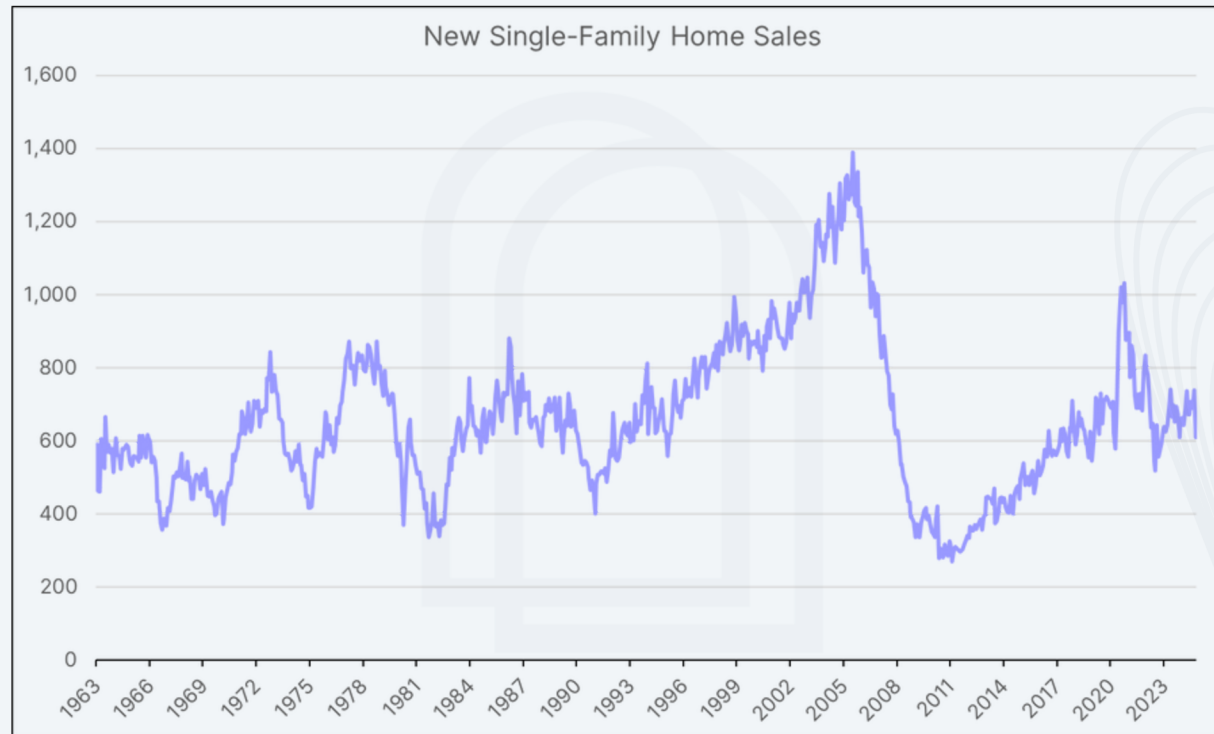


Source: Reef Insights LLC



Source: Reef Insights LLC

NEW SINGLE-FAMILY HOME SALES

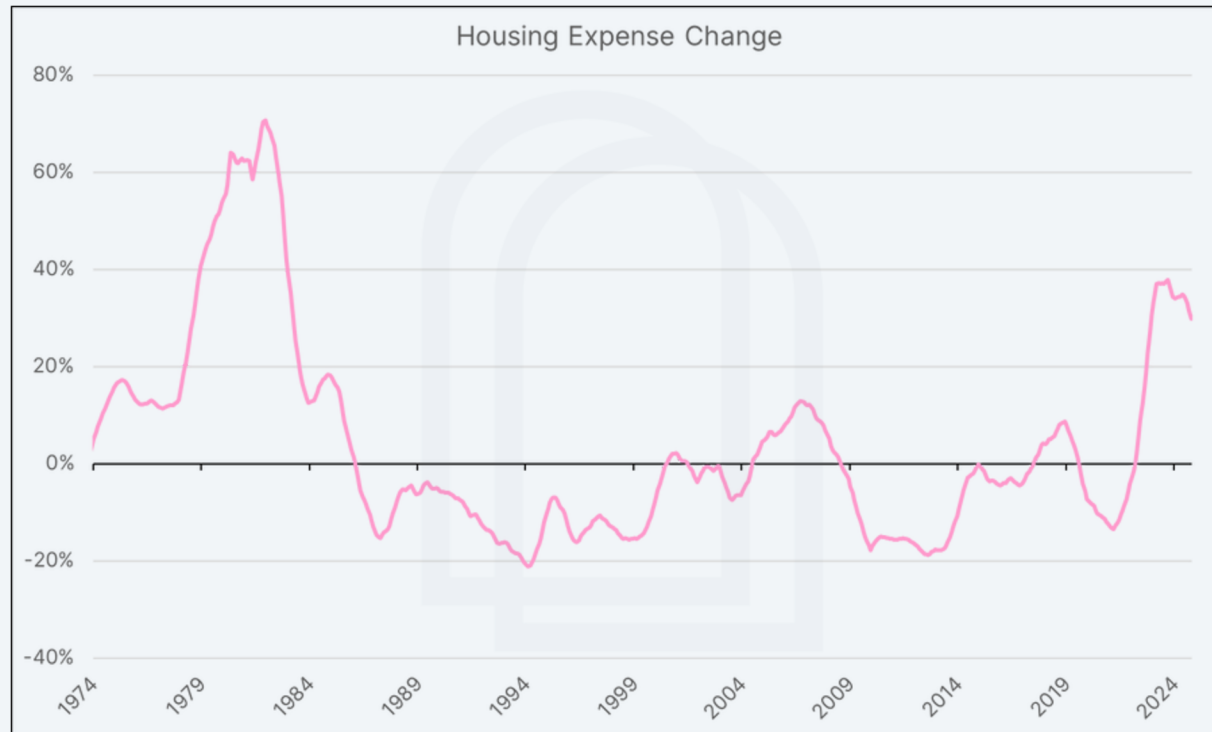


Source: U.S. Census Bureau

New single-family home sales declined 9.36% YoY to 610,000 units in October. This weakness in new home demand reflects both affordability challenges and buyer uncertainty in the current market environment. The decline is particularly significant given demographic tailwinds from millennial household formation and the overall housing shortage in many markets.

Historical patterns suggest current sales volumes at these levels often precede adjustments in construction employment and housing starts, as builders align capacity with demand. The divergence between demographic demand and current sales levels suggests affordability rather than fundamental demand remains the primary market constraint.

HOUSING EXPENSE CHANGE



Source: Reef Insights LLC

The housing expense volatility metric decreased to 29.8% in October, comparing current expense ratios to 10-year averages. This elevated reading indicates housing costs remain significantly above historical patterns despite recent moderation. The metric helps explain current market dynamics, including reduced transaction volumes and builder caution. High expense volatility historically correlates with increased market risk and reduced transaction volume, as both buyers and sellers struggle to price assets appropriately.

This volatility metric has proved particularly predictive of future construction activity levels, as builders respond to uncertainty by moderating new starts.

The background of the slide is a light blue-grey color. It is decorated with several sets of thin, red, wavy lines that flow across the corners and sides of the frame. These lines are arranged in a way that creates a sense of movement and depth, resembling stylized waves or perhaps the layers of a topographical map. The lines are most concentrated in the top-left, bottom-left, and bottom-right corners, with some extending towards the center.

SUPPLY & CONSTRUCTION

HOUSING SUPPLY



Source: U.S. Census Bureau, U.S. Department of Housing and Urban Development



Source: National Association of Realtors

New housing supply expanded to 9.5 months (+20.25% YoY) while existing supply reached 4.2 months, exceeding the 10-year average of 3.6 months. This divergence between new and existing inventory levels reveals distinct market dynamics.

The elevated new home supply suggests builders are struggling to clear inventory despite production adjustments, while existing home supply remains constrained by rate lock-in effects. With new homes representing only 10% of the market, the overall supply picture remains tight despite builder inventory challenges.

This unusual supply dynamic, where new home inventory builds while existing home inventory remains constrained, creates complex market signals for builders and buyers alike.

NEW HOMES FOR SALE

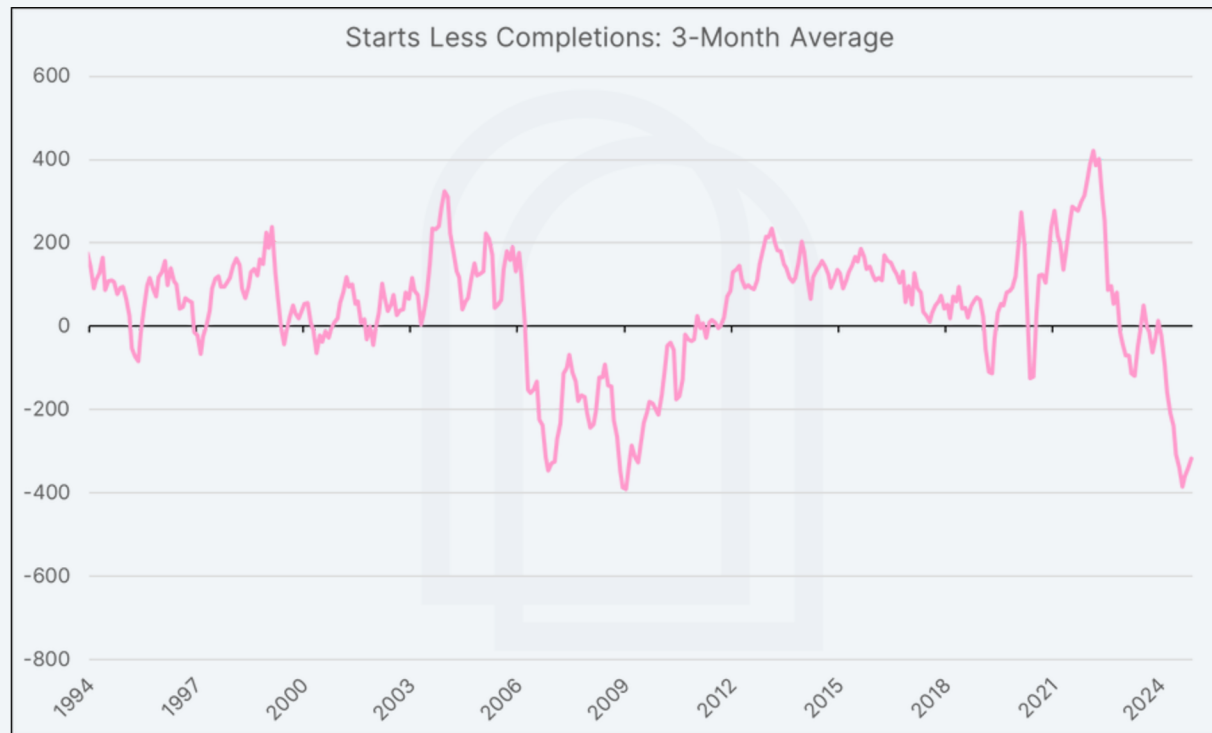


Source: U.S. Census Bureau, U.S. Department of Housing and Urban Development

New homes for sale increased to 113,000 units in October, marking a dramatic 50.67% surge year-over-year. This substantial increase in new home inventory, combined with the elevated months' supply figures, suggests builders may be struggling to clear completed inventory in the current market environment. The magnitude of this year-over-year increase raises concerns about potential oversupply in the new construction market, particularly given the concurrent affordability challenges and rising mortgage rates.

This dramatic build up echoes some patterns seen during the early stages of the Great Financial Crisis. However, unlike this previous rise in inventory, construction has not been comparable, which signals that there exists a much lower demand for new homes when compared to the aforementioned period.

BUILDING ACTIVITY



Source: U.S. Census Bureau, U.S. Department of Housing and Urban Development

The spread between housing starts and completions (3-month rolling average) widened to 314,000 units in November, indicating builders are focusing on completing existing projects rather than initiating new ones. This metric provides insight into builder strategy and confidence, suggesting a defensive posture toward future market conditions.

The negative spread often precedes broader adjustments in construction activity and employment. Historical patterns suggest spreads at these levels typically persist for 3-6 months before seeing significant reversal, pointing to continued caution in near-term construction activity.

REAL RESIDENTIAL CONSTRUCTION SPENDING

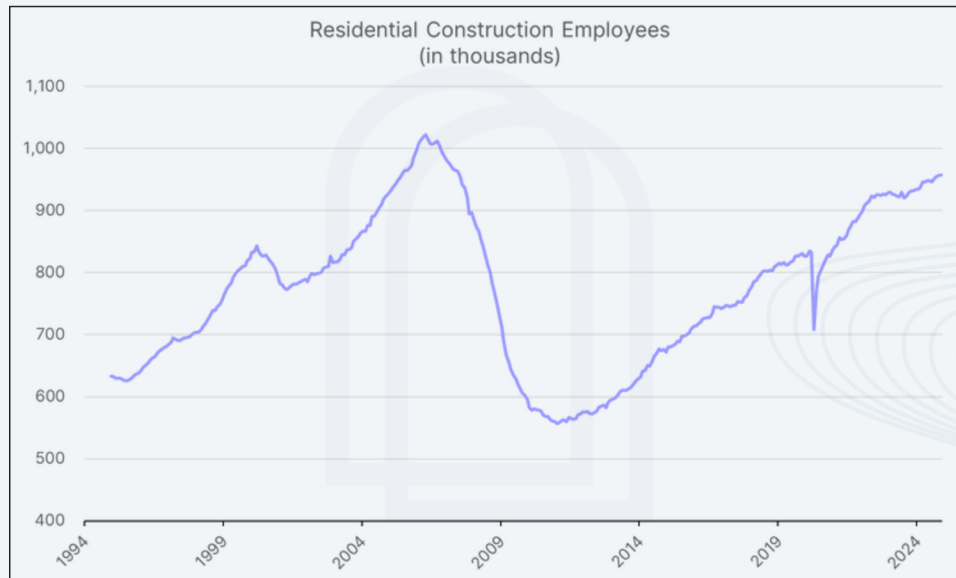


Source: Reef Insights

The Real Residential Construction Spend Index increased to 110.31 (+5.65% YoY) in October, indicating sustained investment despite market headwinds. This metric, adjusted for construction cost inflation, provides insight into actual building activity volume rather than nominal spending. The current reading suggests builders are maintaining activity levels despite demand uncertainty, though this may reflect the completion of previously started projects rather than new investment.

The divergence between spending levels and other metrics like job openings and starts-completions spread suggests current spend levels may not be sustainable without improvement in market conditions.

CONSTRUCTION EMPLOYEES AND JOB OPENINGS



Source: U.S. Bureau of Labor Statistics

Construction employment trends show a complex picture: current employment grew 2.81% YoY to 958,000 workers, while job openings plummeted 39.71% YoY to 249,000. This dramatic decline in openings while maintaining current employment levels suggests builders anticipate reduced future demand and are adjusting capacity accordingly.



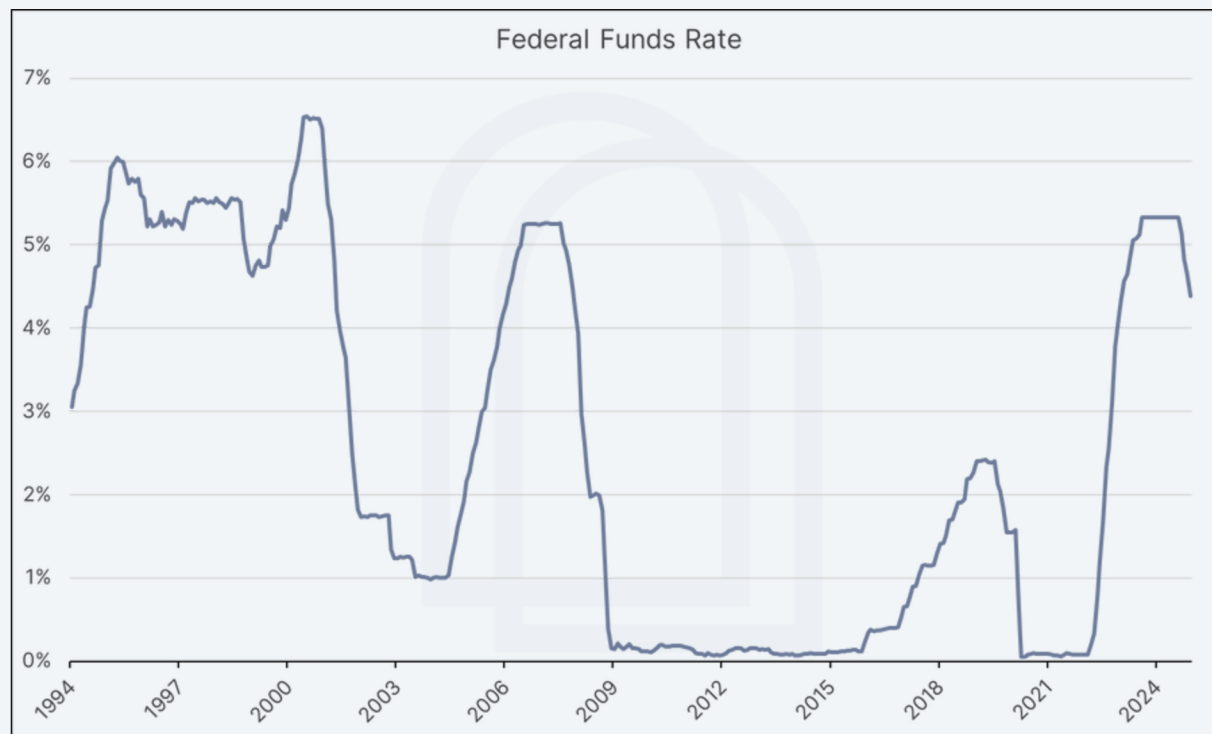
Source: U.S. Bureau of Labor Statistics

Historical patterns show job openings often lead actual employment changes by 6-12 months, suggesting current employment levels may face pressure in 2025 without market improvement. The magnitude of the openings decline is particularly notable and may indicate a significant shift in builder outlook despite relatively stable current activity levels.



MARKET RISKS & OUTLOOK

FEDERAL FUNDS RATE



Source: Board of Governors of the Federal Reserve System

The Federal Reserve's December 2024 meeting marked a pivotal shift in monetary policy, with the FOMC reducing the target range for the federal funds rate by 25 basis points to 4.25%-4.5%. This third consecutive rate cut reflects the Fed's evolving stance from inflation fighting to a more balanced approach. While economic activity continues to expand at a solid pace with GDP growth projected around 2%, the Fed's tone has become notably more measured regarding future policy decisions.

The labor market remains resilient at 4.2% unemployment, but shows signs of cooling that warrant monitoring. Inflation, while easing significantly over the past two years, persists above the 2% target, creating a complex backdrop for housing market dynamics. The Fed's more cautious approach to future rate adjustments, signaling just two rate cuts in 2025, suggests a gradual normalization path that could extend through 2025, maintaining pressure on housing affordability in the near term.



Construction Activity Likely to Contract in Early 2025

The dramatic 39.71% year-over-year decline in construction job openings, combined with the widening spread between housing starts and completions, signals a likely pullback in construction activity through early 2025. While current employment levels remain stable with 2.81% year-over-year growth, historical patterns suggest job openings lead employment changes by 6-12 months. Given sustained affordability challenges and elevated new home inventory levels at 9.5 months of supply, builders are likely to reduce production capacity until market conditions show meaningful improvement. This adjustment could manifest in both reduced housing starts and construction employment declines by Q2 2025.



Market Valuations to Face Continued Pressure Despite Fed Easing

Despite the Federal Reserve's shift toward monetary easing, housing market valuations are likely to remain under pressure through 2025. Current overvaluation of 15.2% according to our Fair Value Variable, combined with mortgage payments consuming 30.3% of median household income, suggests significant adjustment is still needed to align with historical affordability measures. While Fed rate cuts may provide some relief, the magnitude of overvaluation indicates that a combination of price moderation and income growth will be necessary to restore market balance. The persistence of mortgage rates above 6% despite recent Fed cuts suggests that meaningful affordability improvements may take longer than in previous cycles.



Supply-Demand Dynamics to Remain Distorted Through 2025

The current bifurcation between new and existing home supply is likely to persist through 2025, maintaining pressure on overall market liquidity. Rate lock-in effects will continue to suppress existing home inventory as long as mortgage rates remain significantly above the rates held by current homeowners. Meanwhile, elevated new home inventory levels suggest builders will need to rely more heavily on price adjustments or incentives to clear current stock. This unusual supply dynamic, combined with demographic demand from millennials, points toward a prolonged period of market friction where both buyers and sellers struggle to find equilibrium pricing, potentially leading to increased market share for new homes despite their higher inventory levels.

DATA TABLE

| Metric | This Period | Last Period | Year Ago | Latest Release |
|---|-------------|-------------|------------|----------------|
| Housing Starts: Total Units | 1,289 | 1,312 | 1,510 | Nov-24 |
| New Housing Supply | 9.50 | 7.70 | 7.90 | Oct-24 |
| Existing Housing Supply | 3.80 | 4.20 | 3.50 | Nov-24 |
| Nominal Median Sales Price of Houses Sold | \$ 420,400 | \$ 414,500 | \$ 435,400 | Jul-24 |
| New Building Permit Authorizations: Total Units | 1,505 | 1,419 | 1,508 | Nov-24 |
| Case-Shiller Index | 324.80 | 325.13 | 312.63 | Sep-24 |
| Residential Construction Employees | 958 | 956 | 931 | Nov-24 |
| Nominal Mortgage Rates | 6.81 | 6.72 | 7.22 | Dec-24 |
| Delinquency Rates: Single-Family | 1.73 | 1.73 | 1.72 | Jul-24 |
| Delinquency Rates: Commercial | 1.52 | 1.41 | 0.85 | Jul-24 |
| PPI: Residential Construction | 323 | 322 | 312 | Nov-24 |
| Construction Spending: Residential | \$ 946 | \$ 932 | \$ 889 | Oct-24 |
| Housing Inventory: Median Days on Market | 62 | 58 | 61 | Nov-24 |
| Nominal Monthly Mortgage Payment | \$ 2,195 | \$ 2,175 | \$ 2,303 | Dec-24 |
| Real Mortgage Payment Index | 544.75 | 560.54 | 622.32 | Oct-24 |
| Median Household Income Spent on Annual Mortgage Payments | 30.28 | 31.15 | 34.59 | Oct-24 |
| Fair Value Variable | (15.21) | (17.85) | (29.27) | Oct-24 |

DATA TABLE

| Metric | This Period | Last Period | Year Ago | Latest Release |
|--|-------------|-------------|-----------|----------------|
| Housing Expense Change | 29.83 | 31.50 | 36.66 | Oct-24 |
| Nominal Median Household Income | \$ 80,610 | \$ 74,580 | \$ 74,580 | 2023 |
| Headline Inflation | 2.73 | 2.58 | 3.14 | Nov-24 |
| Core Inflation | 3.30 | 3.30 | 4.02 | Nov-24 |
| Unemployment Rate | 4.20 | 4.10 | 3.70 | Nov-24 |
| Federal Funds Rate | 4.64 | 4.83 | 5.33 | Nov-24 |
| Personal Savings Rate | 4.40 | 4.50 | 4.60 | Nov-24 |
| Jobless Claims | 220,000 | 242,000 | 207,000 | Dec-24 |
| 10-Year U.S. Treasury Yield Minus 2-Year U.S. Treasury | (0.34) | (0.26) | (0.74) | Dec-24 |
| Residential Rental Vacancy Rate | 6.90 | 6.60 | 6.60 | Jul-24 |
| Real Residential Construction Spend Index | 110.27 | 108.96 | 104.41 | Oct-24 |
| Household Savings | \$ 1,162 | \$ 711 | \$ 711 | 2023 |
| Bank Credit: All Commercial Banks | \$ 17,980 | \$ 17,950 | \$ 17,341 | Dec-24 |
| Delinquency Rates: Credit Card | 3.23 | 3.24 | 2.97 | Jul-24 |
| Gross Domestic Product (GDP) | \$ 29,375 | \$ 29,017 | \$ 27,968 | Jul-24 |
| M2 (Money Supply) | \$ 21,311 | \$ 21,223 | \$ 20,663 | Oct-24 |
| Federal Reserve's Balance Sheet | \$ 6,889 | \$ 6,897 | \$ 7,724 | Dec-24 |

DATA TABLE

| Metric | This Period | Last Period | Year Ago | Latest Release |
|---|--------------|--------------|--------------|----------------|
| PCE: Headline Inflation | 2.44 | 2.31 | 2.70 | Nov-24 |
| PCE: Core Inflation | 2.82 | 2.79 | 3.22 | Nov-24 |
| Debt-to-GDP | 120.73 | 120.04 | 118.59 | Jul-24 |
| Real GDP | \$ 23,400 | \$ 23,224 | \$ 22,781 | Jul-24 |
| Trucking Employees | 1,549 | 1,546 | 1,550 | Nov-24 |
| Industrial Production | 102 | 102 | 103 | Nov-24 |
| Credit Card Interest Rates | 21.76 | 21.51 | 21.19 | Aug-24 |
| Charge-Off Rate: Credit Card Loans | 4.37 | 4.73 | 3.49 | Jul-24 |
| Charge-Off Rate: Business Loans | 0.56 | 0.49 | 0.40 | Jul-24 |
| Charge-Off Rate: Commercial Real Estate Loans | 0.25 | 0.23 | 0.16 | Apr-24 |
| Yield Curve | 0.12 | 0.10 | (0.27) | Nov-24 |
| Total Assets: Money Market Funds | \$ 6,839,054 | \$ 6,548,352 | \$ 6,142,962 | Jul-24 |
| Federal Government Interest Payments | \$ 1,117 | \$ 1,097 | \$ 968 | Jul-24 |
| CPI: Rent in U.S. City Average | 427 | 425 | 409 | Nov-24 |
| Consumer Loans: Credit Card Debt | #N/A | \$ 1,075 | \$ 1,031 | Dec-24 |
| New Single-Family Home Sales | 610 | 738 | 673 | Oct-24 |
| New Housing Units Completed | 1,601 | 1,632 | 1,466 | Nov-24 |

DATA TABLE

| Metric | This Period | Last Period | Year Ago | Latest Release |
|---|-------------|-------------|------------|----------------|
| Job Openings: Construction | 249 | 258 | 413 | Oct-24 |
| New Homes: Median Square Footage | 2,171 | 2,101 | 2,221 | Jul-24 |
| Median Sales Price of New Houses Sold | \$ 437,300 | \$ 426,800 | \$ 417,500 | Oct-24 |
| Job Openings: Total Nonfarm | 7,744 | 7,372 | 8,685 | Oct-24 |
| Housing Inventory: Active Listing Count | 953,452 | 953,814 | 755,489 | Nov-24 |
| New Homes For Sale | 113 | 108 | 75 | Oct-24 |
| Quits: Total Private | 3,148 | 2,917 | 3,453 | Oct-24 |

SOURCES

| Metric | Frequency | Sources | Notes |
|---|-----------|--|---|
| Housing Starts: Total Units | Monthly | U.S. Census Bureau, U.S. Department of Housing and Urban Development | As provided by the Census, start occurs when excavation begins for the footings or foundation of a building. All housing units in a multifamily building are defined as being started when this excavation begins. Beginning with data for September 1992, estimates of housing starts include units in structures being totally rebuilt on an existing foundation. |
| New Housing Supply | Monthly | U.S. Census Bureau, U.S. Department of Housing and Urban Development | The months' supply is the ratio of new houses for sale to new houses sold. This statistic provides an indication of the size of the new for-sale inventory in relation to the number of new houses currently being sold. The months' supply indicates how long the current new for-sale inventory would last given the current sales rate if no additional new houses were built. |
| Existing Housing Supply | Monthly | National Association of Realtors | The National Association of Realtors monthly housing indicators are based on a representative sample of local boards and multiple listing services. Sales volume, inventory, and price levels for existing homes are measured for the US in aggregate and by census region. Existing homes, unlike new homes, are homes that are owned and occupied before coming onto the market. Inventory indicates the number of properties marked as "active" on the market or those pending sales. When a seller lists a property, it becomes counted as inventory. |
| Nominal Median Sales Price of Houses Sold | Quarterly | U.S. Census Bureau, U.S. Department of Housing and Urban Development | The purpose of the Survey of Construction (SOC) is to provide national and regional statistics on starts and completions of new single-family and multifamily housing units and statistics on sales of new single-family houses in the United States. The United States Code, Title 13, authorizes this survey and provides for voluntary responses. The Department of Housing and Urban Development partially funds this survey. The SOC also provides statistics on characteristics of new privately-owned residential structures in the United States. Data included are various characteristics of new single-family houses completed, new multifamily housing completed, new single-family houses sold, and new contractor-built houses started. |
| New Building Permit Authorizations: Total Units | Monthly | U.S. Census Bureau, U.S. Department of Housing and Urban Development | Starting with the 2005-02-16 release, the series reflects an increase in the universe of permit-issuing places from 19,000 to 20,000 places. |
| Case-Shiller Index | Monthly | S&P Dow Jones Indices LLC | The S&P CoreLogic Case-Shiller Home Price Indices measure the price level of existing single-family homes in the U.S. |
| Residential Construction Employees | Monthly | U.S. Bureau of Labor Statistics | Construction employees in the construction sector include: Working supervisors, qualified craft workers, mechanics, apprentices, helpers, laborers, and so forth, engaged in new work, alterations, demolition, repair, maintenance, and the like, whether working at the site of construction or in shops or yards at jobs (such as precutting and preassembling) ordinarily performed by members of the construction trades. |
| Nominal Mortgage Rates | Weekly | Freddie Mac | On November 17, 2022, Freddie Mac changed the methodology of the Primary Mortgage Market Survey® (PMMS®). The weekly mortgage rate is now based on applications submitted to Freddie Mac from lenders across the country. For more information regarding Freddie Mac's enhancement, see their research note. |
| Delinquency Rates: Single-Family | Quarterly | Board of Governors of the Federal Reserve System | The charge-off rates are annualized and are calculated net of recoveries. Delinquent loans and leases encompass those that are past due by thirty days or more and are still accruing interest, as well as those in nonaccrual status. This comprehensive approach provides insight into the financial health and performance metrics of these major banks, considering both charge-offs and delinquencies in their loan portfolios. |

SOURCES

| Metric | Frequency | Sources | Notes |
|---|-----------|--|--|
| Delinquency Rates: Commercial Real Estate | Quarterly | Board of Governors of the Federal Reserve System | The charge-off rates are annualized and are calculated net of recoveries. Delinquent loans and leases encompass those that are past due by thirty days or more and are still accruing interest, as well as those in nonaccrual status. This comprehensive approach provides insight into the financial health and performance metrics of these major banks, considering both charge-offs and delinquencies in their loan portfolios. |
| PPI: Residential Construction | Monthly | U.S. Bureau of Labor Statistics | The Producer Price Index (PPI) program measures the average change over time in the selling prices received by domestic producers for their output. The prices included in the PPI are from the first commercial transaction for many products and some services. |
| Construction Spending: Residential | Monthly | U.S. Census Bureau | Construction work done each month on new structures or improvements to existing structures for private and public sectors (in 50 states and the District of Columbia). |
| Housing Inventory: Median Days on Market | Monthly | Realtor.com | With the release of its September 2022 housing trends report, Realtor.com® incorporated a new and improved methodology for capturing and reporting housing inventory trends and metrics. The new methodology updates and improves the calculation of time on market and improves handling of duplicate listings. Most areas across the country will see minor changes with a smaller handful of areas seeing larger updates. As a result of these changes, the data released since October 2022 will not be directly. |
| Nominal Monthly Mortgage Payment | Monthly | Reef Insights LLC | The nominal monthly mortgage payment is determined based on the current prevailing mortgage rate and the median sales price of houses sold. Our calculations are grounded in the following assumptions: a 20 percent down payment, a 30-year maturity period, and a fixed interest rate. |
| Real Mortgage Payment Index | Monthly | Reef Insights LLC | The real mortgage payment index is calculated by dividing the nominal monthly mortgage payment by the prevailing CPI index value. |
| Median Household Income Spent on Annual Mortgage Payments | Monthly | Reef Insights LLC | To determine the median household income spent on annual mortgage payments, we have annualized the prevailing nominal monthly mortgage payment and divided that payment by the prior years' median household income. |
| Fair Value Variable | Monthly | Reef Insights LLC | The analysis incorporates three distinct rolling averages signifying the percentage of median household income allocated to annual mortgage payments. These averages span 5 years, 10 years, and 15 years, respectively. In the determination of a 'fair value' premium or discount for each period, the established averages are divided by the prevailing percentage of median household income dedicated to annual mortgage payments. The resultant values are subsequently averaged to ascertain a premium or discount, which is applicable to the prevailing median sales price of houses sold. |
| Housing Expense Change | Monthly | Reef Insights LLC | The computed values have been obtained through the division of the rolling 1-year average for the percentage of median household income allocated to annual mortgage payments by the rolling 10-year average. |
| Nominal Median Household Income | Annually | U.S. Census Bureau | The median divides the income distribution into two equal parts: one-half of the cases falling below the median income and one-half above the median. For households and families, the median income is based on the distribution of the total number of households and families including those with no income. The median income for individuals is based on individuals 15 years old and over with income. Median income for households, families, and individuals is computed on the basis of a standard distribution. |

SOURCES

| Metric | Frequency | Sources | Notes |
|--|-----------|--|---|
| CPI: Headline Inflation | Monthly | U.S. Bureau of Labor Statistics | The CPIs are based on prices for food, clothing, shelter, and fuels; transportation fares; service fees (e.g., water and sewer service); and sales taxes. Prices are collected monthly from about 4,000 housing units and approximately 26,000 retail establishments across 87 urban areas. To calculate the index, price changes are averaged with weights representing their importance in the spending of the particular group. The index measures price changes (as a percent change) from a predetermined reference date. In addition to the original unadjusted index distributed, the Bureau of Labor Statistics also releases a seasonally adjusted index. The unadjusted series reflects all factors that may influence a change in prices. However, it can be very useful to look at the seasonally adjusted CPI, which removes the effects of seasonal changes, such as weather, school year, production cycles, and holidays. |
| CPI: Core Inflation | Monthly | U.S. Bureau of Labor Statistics | The "Consumer Price Index for All Urban Consumers: All Items Less Food & Energy" is an aggregate of prices paid by urban consumers for a typical basket of goods, excluding food and energy. This measurement, known as "Core CPI," is widely used by economists because food and energy have very volatile prices. |
| Unemployment Rate | Monthly | U.S. Bureau of Labor Statistics | The unemployment rate represents the number of unemployed as a percentage of the labor force. Labor force data are restricted to people 16 years of age and older, who currently reside in 1 of the 50 states or the District of Columbia, who do not reside in institutions (e.g., penal and mental facilities, homes for the aged), and who are not on active duty in the Armed Forces. |
| Federal Funds Rate | Monthly | Board of Governors of the Federal Reserve System | The federal funds market consists of domestic unsecured borrowings in U.S. dollars by depository institutions from other depository institutions and certain other entities, primarily government-sponsored enterprises. |
| Personal Savings Rate | Monthly | U.S. Bureau of Economic Analysis | Personal saving as a percentage of disposable personal income (DPI), frequently referred to as "the personal saving rate," is calculated as the ratio of personal saving to DPI. Personal saving is equal to personal income less personal outlays and personal taxes; it may generally be viewed as the portion of personal income that is used either to provide funds to capital markets or to invest in real assets such as residences. |
| Jobless Claims | Weekly | U.S. Employment and Training Administration | An initial claim is a claim filed by an unemployed individual after a separation from an employer. The claim requests a determination of basic eligibility for the Unemployment Insurance program. |
| 10-Year U.S. Treasury Yield Minus 2-Year U.S. Treasury | Weekly | Board of Governors of the Federal Reserve System | This particular yield curve is derived by subtracting the 10-year U.S. Treasury by the 2-Year U.S. Treasury. |
| Residential Rental Vacancy Rate | Quarterly | U.S. Census Bureau | The rental vacancy rate is the proportion of the rental inventory that is vacant for rent. |
| Real Residential Construction Spend Index | Monthly | Reef Insights LLC | This index is constructed by dividing the Total Construction Spending: Residential by the CPI: Residential Construction. |
| Household Savings | Annually | U.S. Bureau of Economic Analysis | To calculate the amount of household savings, the BEA starts with personal income, and then subtracts from that personal taxes to derive disposable personal income. Then, personal outlays are subtracted from disposable income. This results in an estimate of household savings. |

SOURCES

| Metric | Frequency | Sources | Notes |
|-----------------------------------|-----------|--|---|
| Bank Credit: All Commercial Banks | Weekly | Board of Governors of the Federal Reserve System | The H.8 release provides an estimated weekly aggregate balance sheet for all commercial banks in the United States. The release also includes separate balance sheet aggregations for several bank groups: domestically chartered commercial banks; large domestically chartered commercial banks; small domestically chartered commercial banks; and foreign-related institutions in the United States |
| Delinquency Rates: Credit Card | Quarterly | Board of Governors of the Federal Reserve System | For more information, check out the Charge-Off and Delinquency Rates on Loans and Leases at Commercial Banks release. |
| Gross Domestic Product (GDP) | Quarterly | U.S. Bureau of Economic Analysis | Gross domestic product (GDP), the featured measure of U.S. output, is the market value of the goods and services produced by labor and property located in the United States. |
| M2 (Money Supply) | Monthly | Board of Governors of the Federal Reserve System | Beginning May 2020, M2 consists of M1 plus (1) small-denomination time deposits (time deposits in amounts of less than \$100,000) less IRA and Keogh balances at depository institutions; and (2) balances in retail MMFs less IRA and Keogh balances at MMFs. Seasonally adjusted M2 is constructed by summing savings deposits (before May 2020), small-denomination time deposits, and retail MMFs, each seasonally adjusted separately, and adding this result to seasonally adjusted M1. |
| Federal Reserve's Balance Sheet | Weekly | Board of Governors of the Federal Reserve System | For more information, check out the H.4.1 release. |
| PCE: Headline Inflation | Monthly | U.S. Bureau of Economic Analysis | Table 9.1U - Comparison of the PCE Price Index with the CPI reconciles the changes in the personal consumption expenditures (PCE) chain-type price index, prepared by the Bureau of Economic Analysis (BEA), with changes in the consumer price index for all urban consumers (CPI), prepared by the Bureau of Labor Statistics (BLS). |
| PCE: Core Inflation | Monthly | U.S. Bureau of Economic Analysis | Table 9.1U - Comparison of the PCE Price Index with the CPI reconciles the changes in the personal consumption expenditures (PCE) chain-type price index, prepared by the Bureau of Economic Analysis (BEA), with changes in the consumer price index for all urban consumers (CPI), prepared by the Bureau of Labor Statistics (BLS). |
| Debt-to-GDP | Quarterly | U.S. Office of Management and Budget | Federal Debt: Total Public Debt as Percent of Gross Domestic Product (GFDEGDQ188S) was first constructed by the Federal Reserve Bank of St. Louis in October 2012. |
| Real GDP | Quarterly | U.S. Bureau of Economic Analysis | Real gross domestic product is the inflation adjusted value of the goods and services produced by labor and property located in the United States. |
| Trucking Employees | Monthly | U.S. Bureau of Labor Statistics | Each month, CES surveys approximately 119,000 businesses and government agencies, representing approximately 629,000 individual worksites. |
| Industrial Production | Monthly | Board of Governors of the Federal Reserve System | The industrial production (IP) index measures the real output of all relevant establishments located in the United States, regardless of their ownership, but not those located in U.S. territories. |

SOURCES

| Metric | Frequency | Sources | Notes |
|---|-----------|--|---|
| Credit Card Interest Rates | Monthly | Board of Governors of the Federal Reserve System | This release is generally issued on the fifth business day of each month. |
| Charge-Off Rate: Credit Card Loans | Quarterly | Board of Governors of the Federal Reserve System | The 100 largest banks are measured by consolidated foreign and domestic assets. Charge-offs are the value of loans and leases removed from the books and charged against loss reserves. Charge-off rates are annualized, net of recoveries. Delinquent loans and leases are those past due thirty days or more and still accruing interest as well as those in nonaccrual status. |
| Charge-Off Rate: Business Loans | Quarterly | Board of Governors of the Federal Reserve System | The 100 largest banks are measured by consolidated foreign and domestic assets. Charge-offs are the value of loans and leases removed from the books and charged against loss reserves. Charge-off rates are annualized, net of recoveries. Delinquent loans and leases are those past due thirty days or more and still accruing interest as well as those in nonaccrual status. |
| Charge-Off Rate: Commercial Real Estate Loans | Quarterly | Board of Governors of the Federal Reserve System | The 100 largest banks are measured by consolidated foreign and domestic assets. Charge-offs are the value of loans and leases removed from the books and charged against loss reserves. Charge-off rates are annualized, net of recoveries. Delinquent loans and leases are those past due thirty days or more and still accruing interest as well as those in nonaccrual status. |
| Yield Curve | Daily | Federal Reserve Bank of St. Louis | Starting with the update on June 21, 2019, the Treasury bond data used in calculating interest rate spreads is obtained directly from the U.S. Treasury Department. Series is calculated as the spread between 10-Year Treasury Constant Maturity (BC_10YEAR) and 2-Year Treasury Constant Maturity (BC_2YEAR). Both underlying series are published at the U.S. Treasury Department. |
| Total Assets: Money Market Funds | Quarterly | Board of Governors of the Federal Reserve System | For more information about the Flow of Funds tables, see the Financial Accounts Guide. |
| Federal Government Interest Payments | Quarterly | U.S. Bureau of Economic Analysis | For more information about this series, please see http://www.bea.gov/national/ . |
| CPI: Rent in U.S. City Average | Monthly | U.S. Bureau of Labor Statistics | The Consumer Price Index (CPI) is a measure of the average change over time in the prices paid by urban consumers for a market basket of consumer goods and services. Indexes are available for the U.S. and various geographic areas. Average price data for select utility, automotive fuel, and food items are also available. |
| Consumer Loans: Credit Card Debt | Monthly | Board of Governors of the Federal Reserve System | For further information, please refer to the Board of Governors of the Federal Reserve System's H.8 release. |
| New Single-Family Home Sales | Monthly | U.S. Census Bureau | For further further information, please refer to the New Residential Sales report that is published by the U.S. Census Bureau. |
| Hew Housing Unit Completed | Monthly | U.S. Census Bureau | This metric's official title is New Privately-Owned Housing Units Completed: Total Units, and further information can be found on the New Residential Construction report that is published by the U.S. Census Bureau. |
| Job Openings: Construction | Monthly | U.S. Bureau of Labor Statistics | This data can be found in the Job Openings and Labor Turnover Survey report that is published by the U.S. Bureau of Labor Statistics. |
| New Homes: Median Square Footage | Quarterly | U.S. Census Bureau, U.S. Department of Housing and Urban Development | For further information, please refer to the Quarterly Starts and Completions by Purpose of Design release. |
| Median Sales Price of New Houses Sold | Monthly | U.S. Census Bureau | For further further information, please refer to the New Residential Sales report that is published by the U.S. Census Bureau. |

SOURCES

| Metric | Frequency | Sources | Notes |
|---|-----------|--|--|
| Job Openings: Total Nonfarm | Monthly | U.S. Bureau of Labor Statistics | Total Nonfarm Job Openings are a measure of all jobs that are not filled on the last business day of the month. A job is considered open if a specific position exists and there is work available for it, the job can be started within 30 days, and there is active recruiting for the position. |
| Housing Inventory: Active Listing Count | Monthly | Realtor.com | The count of active single-family and condo/townhome listings for a given market during the specified month (excludes pending listings). |
| New Homes For Sale | Monthly | U.S. Census Bureau, U.S. Department of Housing and Urban Development | For further information, please refer to the New Residential Sales release. |
| Quits: Total Private | Monthly | U.S. Bureau of Labor Statistics | For further information, please refer to the Job Openings and Labor Turnover Survey release. |

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Real Estate Economic Forecast - Monthly
Forecast Evaluation - Semi-Annual

On a semi-annual basis, we will be releasing a report that evaluates our past forecasts. We believe it's important to gauge our performance, and we intend to do it publicly so that you can determine if our forecasts are worth your consideration.

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