



REEF REPORT

REAL ESTATE & ECONOMIC FORECAST

UNITED STATES

SUMMARY

Charge-Off Rates:

Charge-off rates for commercial real estate and credit card loans have significantly increased, signaling heightened financial stress. Notably, commercial real estate charge-offs are now nearly double their 2020 peak levels, underscoring the challenges within the sector.

Inflation Trends:

Inflation continues to exceed expectations, with persistent high rates influencing Federal Reserve policy forecasts. The market has adjusted its expectations, now anticipating that the Federal Reserve will maintain a 'higher for longer' stance on interest rates, with no cuts expected in the first half of 2024.

Housing Market:

Housing market dynamics show mixed signals. While the nominal median sales price of homes saw a record decline, affordability metrics such as the Fair Value Variable and Real Mortgage Payment Index suggest slight improvements. Nonetheless, elevated interest rates continue to weigh on purchasing power and overall market activity, while the supply of existing housing has remained somewhat suppressed.

Treasury:

Federal interest payments have surged, now slightly exceeding defense spending, with a significant annual increase to \$1.025 trillion, highlighting rising fiscal pressures. Simultaneously, Treasury issuances have reached over \$2 trillion in March alone, showing a significant increase in Q1 issuances year-over-year and setting up for a record year of issuances for 2024.

KEY DEVELOPMENTS

The escalating charge-off rates for both commercial real estate and credit card loans signal deepening financial stress, with CRE charge-offs now nearly double their 2020 peak. Inflation pressures have also continued to exceed expectations, influencing market predictions regarding Federal Reserve policies. The prevailing view is that interest rates will maintain a 'higher for longer' stance, with no rate cuts expected in the first half of 2024.

Charge-Off Rates



I

Charge-off rates for both commercial real estate (CRE) and credit card loans have been rising over the past couple of quarters. CRE charge-off rates are almost twice as high as the peak levels of 2020. This quarter, there has been a notable increase in the charge-off rate for credit card loans, which rose to 4.07 percent in Q4 2023. When compared to the same period last year, the charge-off rate for credit card loans has increased by 68.18 percent.

Inflation



II

Inflation pressures have remained stronger than the Federal Reserve, as well as the populace, had anticipated. Headline PCE and Core PCE in February came in at 4.88 percent and 2.78 percent respectively. March CPI figures have already been released, and both Headline, at 3.48 percent, and Core, at 3.80 percent, rose month-over-month.

Federal Funds Rate



III

Throughout the year we have been adjusting our position on what periods will not contain a rate cut. Our most recent estimate was that there would not be a rate cut in the first half of 2024, and it appears the market is starting to think so as well. The market is now showing an expectation that the fed funds rate will remain at the 525 - 550 bps target range most likely through the July meeting, and the probabilities continue to shift to a higher for longer stance in light of recent data and comments from Federal Reserve members.

FORECAST

Further Delay for Federal Reserve Rate Cuts

In our previous report, we extended our forecast for the Federal Reserve to maintain rates through Q2 2024. In this report, we are extending our forecast through Q3 2024. Our forecast is predicated on these factors: Inflation was remained stagnate, which has caused the FOMC to be vocal about delaying rate cuts. Employment figures remain strong, which suggests that many companies have been able to forgo layoffs. Although some notable bank failures have occurred over the past few years, there does not appear to be a large amount of stress in the banking system. As is always the case, these factors could change over the course of 2024, so we will continue to update our forecasts as new information is released.

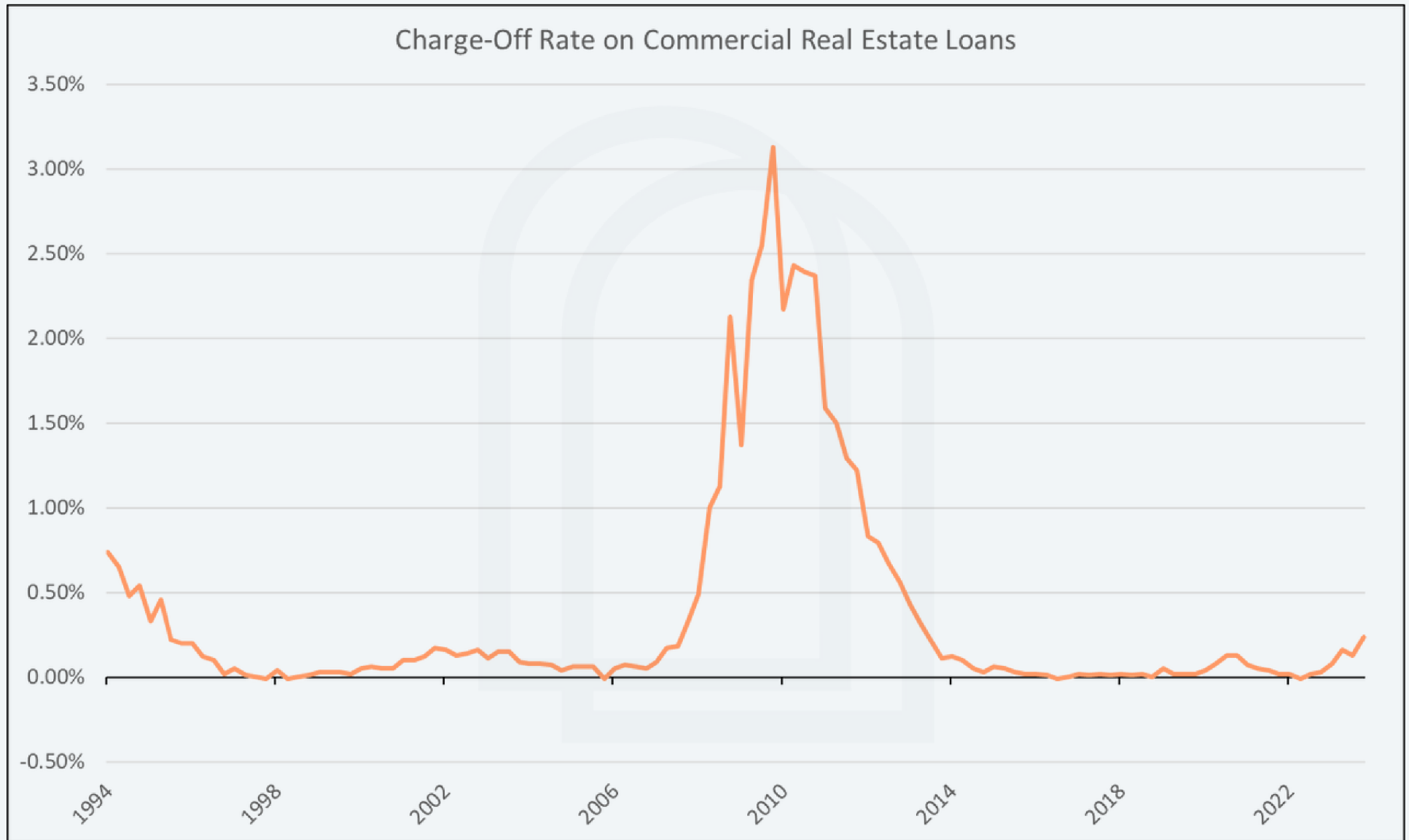
Delinquency Rates Turning to Charge-Off Rates

In our last report, we forecasted that delinquency rates for commercial real estate (CRE) loans would rise. After a certain period of time, lenders will write these loans off, which is captured in charge-off rates. Charge-off rates for credit card loans and CRE loans have been rising, and we expect this trend to continue into Q1 2024. With rates remaining elevated, the pressure on CRE loans will subsequently build. As of Q4 2023, the CRE charge-off rate stands at 0.24 percent, and we expect this figure to rise above 0.30 percent in Q1 2024. We have also seen Q1 financials from the large banks showing further elevated levels of charge-off rates in both CRE and credit cards, as expected with rising delinquency rates.

Home Values

From Q3 2023 to Q4 2023, the median sales price of houses sold fell 4.1 percent, which added to the year-over-year decline of 12.89 percent. Looking at the quarter-over-quarter change from Q4 2023 to Q1 2024, there are numerous factors at play. Demand is subdued due to heightened rates and home values, but the supply for existing houses remains low due to homeowners being reluctant to sell a home that has a low interest rate attached to the mortgage. Nevertheless, we expect that the quarter-over-quarter change will be somewhat tame, with the change not exceeding a 2 percent decline.

CHARGE-OFF RATE ON COMMERCIAL REAL ESTATE LOANS



Source: Board of Governors of the Federal Reserve System

CHARGE-OFF RATE ON COMMERCIAL REAL ESTATE LOANS

Charge-off rates on commercial real estate loans are almost twice as high as the peak levels of 2020.

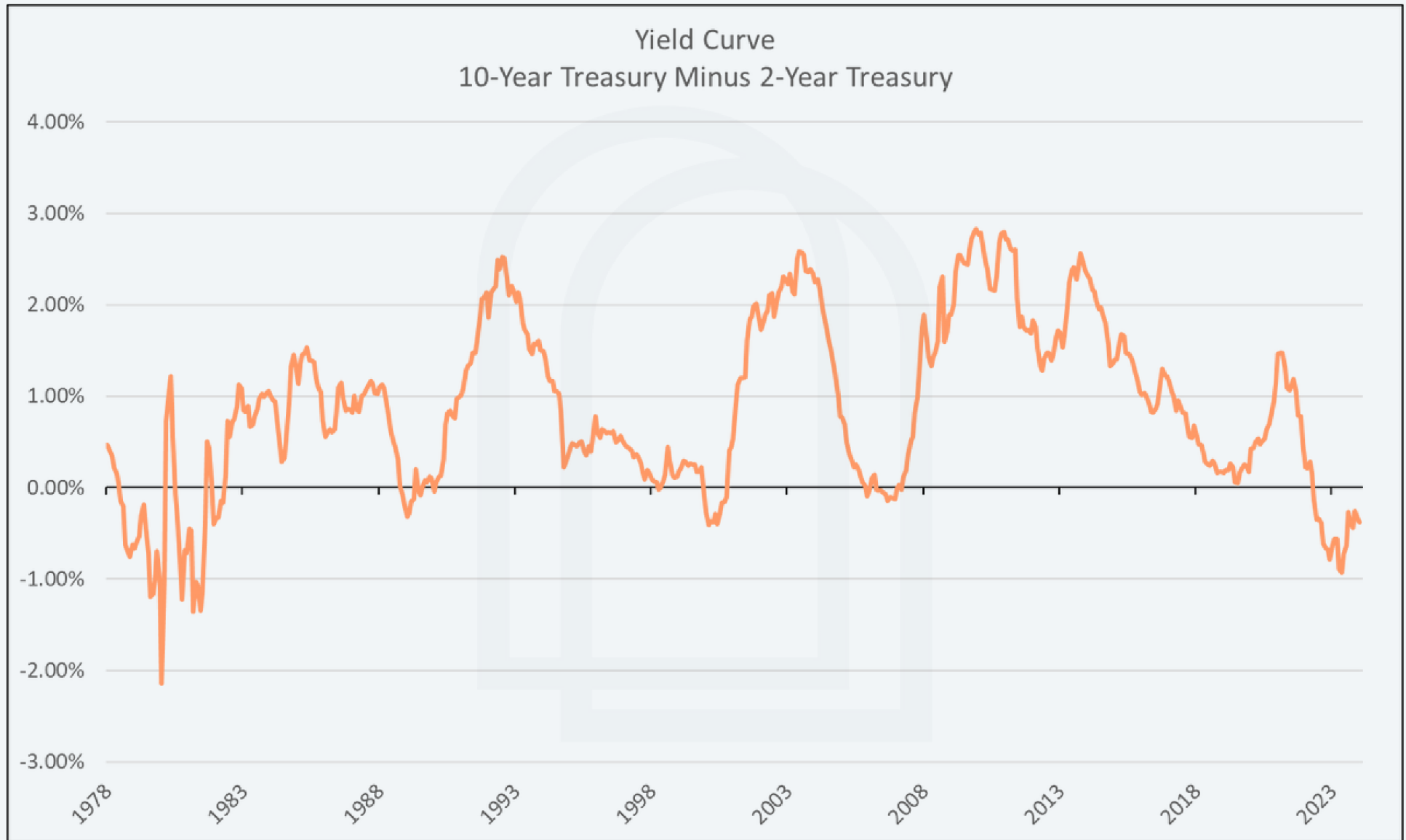
With interest rates remaining elevated and valuations for certain asset classes being depressed, this issue may continue to grow.

Charge-off rates on commercial real estate (CRE) loans represent the percentage of loans that banks and financial institutions have deemed unlikely to be collected and have therefore removed from their books, charging them against their loss reserves.

These rates are crucial indicators of the financial health of the lending institutions and the real estate market. They also provide insights into broader economic conditions, as they tend to rise during economic downturns when borrowers struggle to meet their loan obligations.

As of the latest release, the charge-off rates on CRE loans are moving in a concerning direction. Levels as of Q4 2023 are almost twice as high as those in 2020, with a peak at 0.13% in 2020 compared to a current rate of 0.24%. This increase suggests a growing number of loans that lenders consider uncollectible. The pattern of charge-off rates typically starts slow and then accelerates, indicating that the current rates could potentially rise further as Q1 data comes in.

YIELD CURVE: 10Y - 2Y TREASURY RATE



Source: Federal Reserve Bank of St. Louis

YIELD CURVE: 10Y - 2Y TREASURY RATE

The yield curve has been inverted since July 2022. This is the longest period of inversion on record.

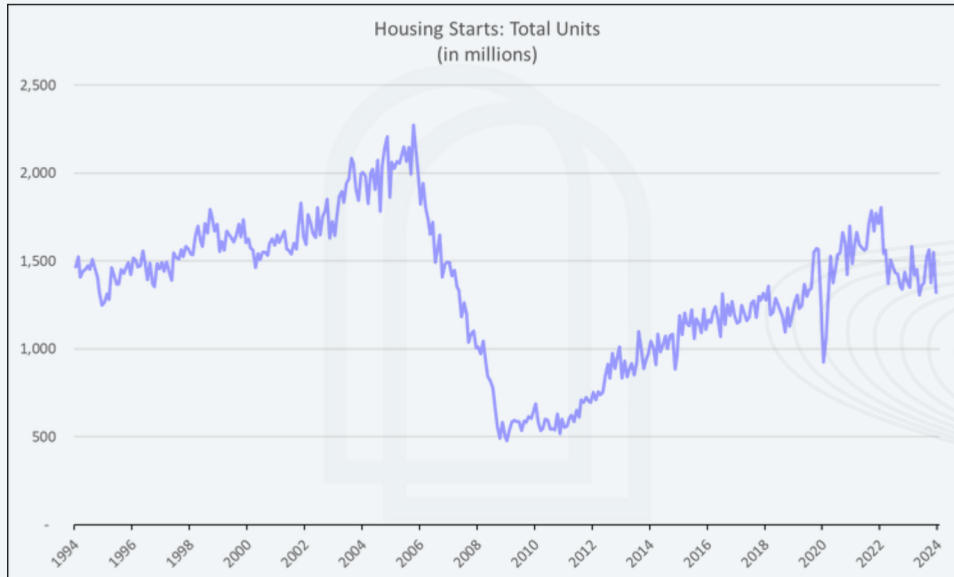
A persistent negative spread between 2-year and 10-year U.S. Treasury yields is a key input into many analysts' models as a reliable predictor of recession, having been observed in the lead-up to nearly all recessions since 1955.

During the aforementioned period, it offered a false signal just once.

There has been a growing discussion as to whether or not the yield curve is a reliable indicator. Nearly two-thirds of strategists in a March 6-12 Reuters poll of bond market experts, 22 of 34, said the yield curve's predictive power is not what it once was.

Historically, a negative sloping yield curve has occurred before recessions. The particular way we are assessing the slope of the yield curve is by subtracting the 2-year U.S. Treasury from the 10-Year U.S. Treasury, which is a commonly used method and sometimes referred to generally as the yield curve. The yield curve saw a decrease month-over-month, with a value of -0.34 percent as of this report. Year-over-year, the yield curve has increased by 45 bps.

NEW HOUSING



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

During a recessionary period, it's common to observe a decline in housing starts. In March, we saw a month-over-month decrease, with 1,321,000 starts reported. Year-over-year, there's been a 4.28 percent decrease in housing starts.

The last time housing starts saw a year-over-year change that was negative was in October 2023. This will be an important metric to watch as the year progresses.

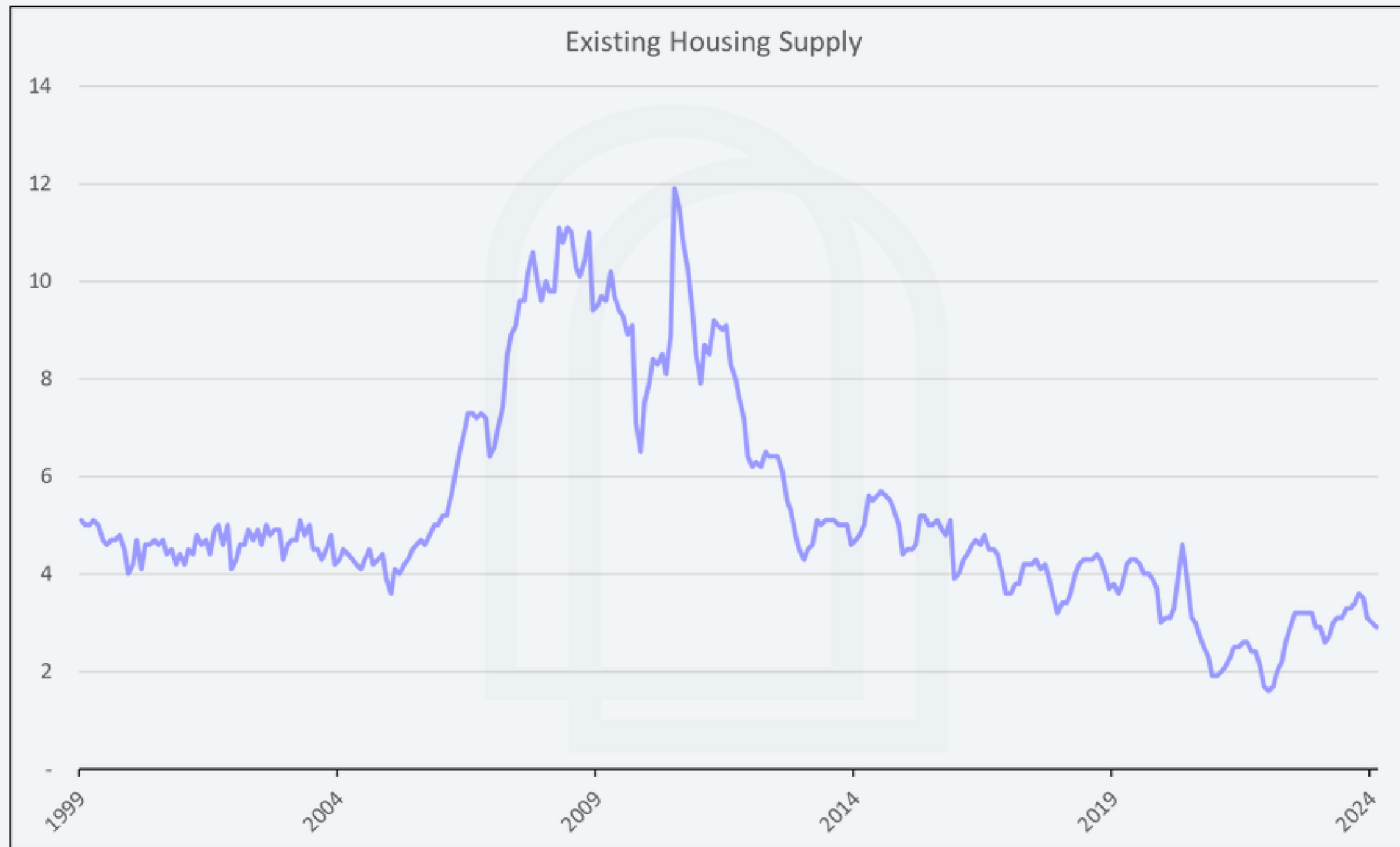


Source: U.S. Census Bureau, U.S. Department of Housing and Urban Development

We gauge the supply of new housing by examining the ratio of new houses for sale to those sold, measured in months. In February, we observed a month-over-month increase, with an 8.4 months' supply reported. Looking at the bigger picture, the months' supply of new housing remains unchanged compared to last year.

It's worth noting that while new housing comprises a portion of total housing sales, it only represents about 10% of the overall market. Homebuilders may slow down building if they don't foresee an increase in demand over the coming year.

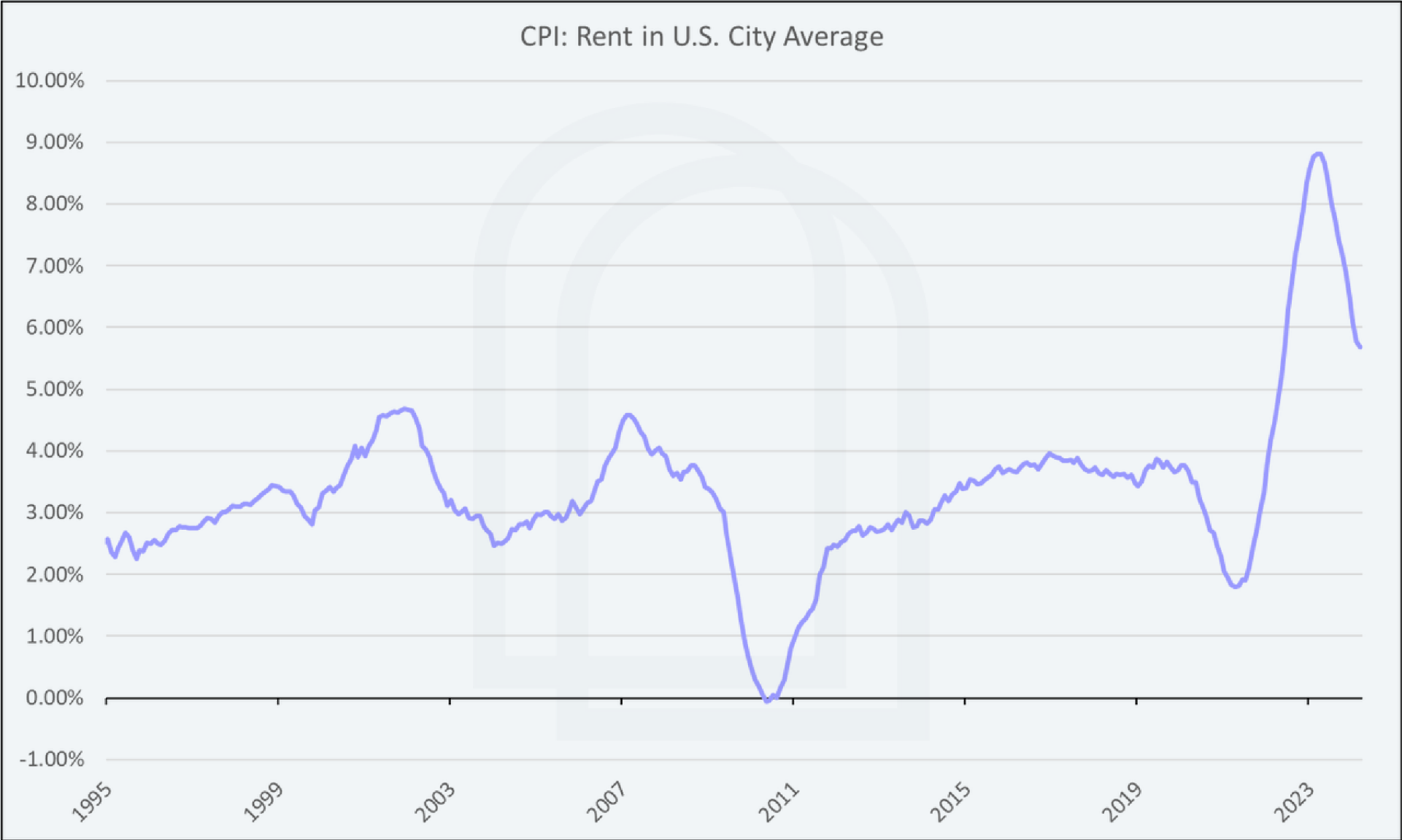
EXISTING HOUSING SUPPLY



Source: National Association of Realtors

When assessing the supply of existing housing, we rely on the ratio of existing houses for sale to those sold, measured in months. In February, we witnessed a month-over-month decrease, with a reported 2.9 months' supply. Comparing year-over-year data, the months' supply of existing housing has increased by 5.33 percent. Existing housing dominates the market, representing approximately 90% of it. Many homeowners are reluctant to move due to having a lower-than-market interest rate tied to their existing mortgage.

CPI: RENT IN U.S. CITY AVERAGE



Source: U.S. Bureau of Labor Statistics

CPI: RENT IN U.S. CITY AVERAGE

In March, the Consumer Price Index (CPI) for average rent in U.S. cities experienced a month-over-month increase, reaching an index value of 415.2. Year-over-year, the CPI for average rent in U.S. cities showed a notable year-over-year uptick of 5.68 percent, though the annual increase has been decreasing. Over the past decade, the average annual increase in this CPI stands at 4.17 percent.

Currently, according to NerdWallet estimates, the breakeven point for buying a home versus renting sits at 16 years. Renting is currently more cost-effective, which is notable given the substantial increase in average rent over recent years.

This affordability trend in renting has led many individuals seeking housing to opt for renting, consequently reducing the demand for both new and existing homes.

In the face of elevated interest rates persisting over time, the pathway to making homeownership more attainable hinges on either a decrease in property prices or an increase in household income. These factors shape the dynamics of the housing market and influence individual decisions regarding renting versus buying.

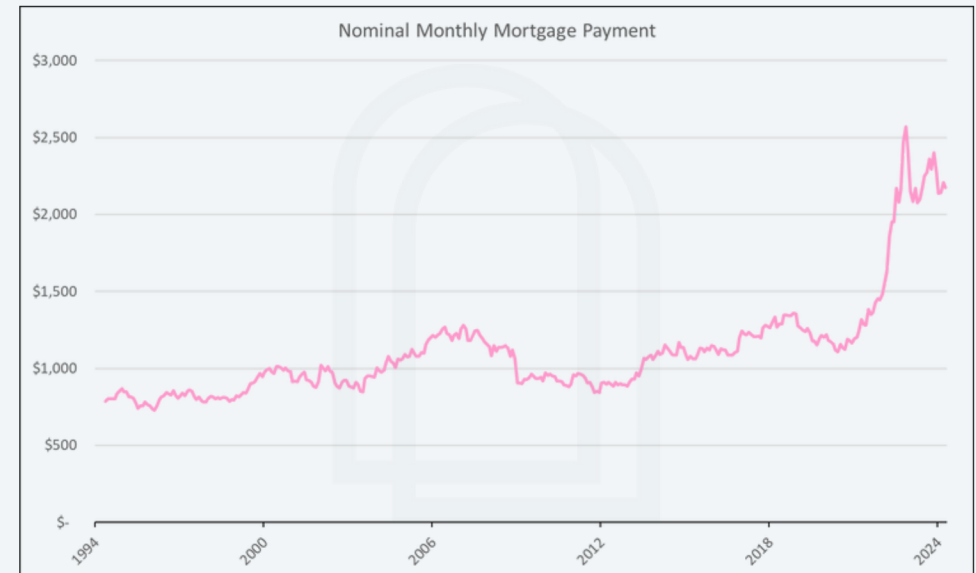
HOUSING COSTS

When determining the nominal monthly mortgage payment, we consider several factors: a 20 percent down payment, a 30-year mortgage term, and a fixed interest rate. This calculation utilizes the prevailing mortgage rate and the median sales price of houses sold.

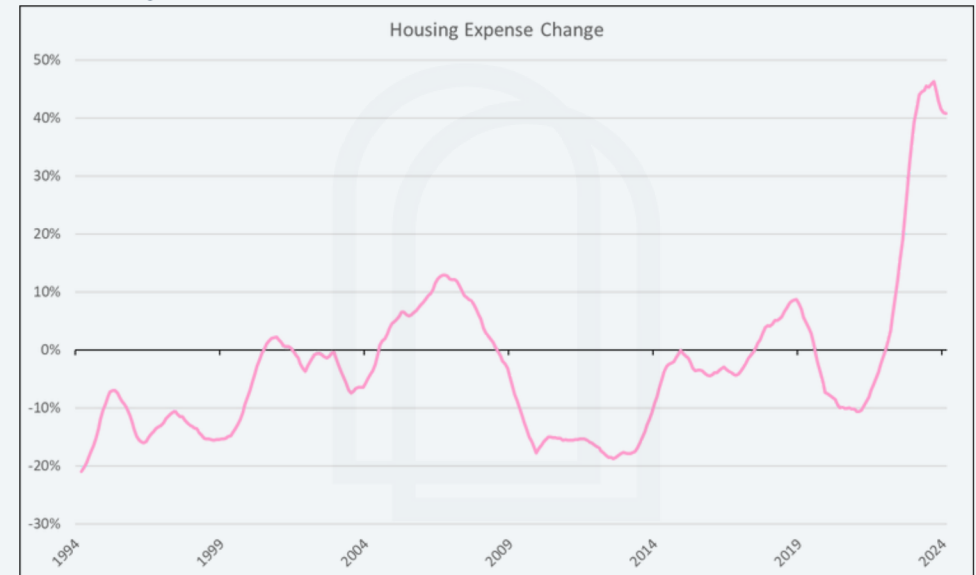
In April, we observed a month-over-month decrease in the nominal monthly mortgage payment, with the current estimated payment standing at \$2,176. Looking back over the past year, there has been a notable increase of 4.8 percent in the nominal monthly mortgage payment. Over the last five years, this payment has surged by 72.5 percent.

To calculate the housing expense change, a metric that gauges the fluctuation in housing expenses, we've utilized a specific formula. It involves dividing the percentage of median household income spent on annual mortgage payments (rolling 1-year average) by the rolling 10-year average.

In February, we observed a month-over-month decrease in the housing expense change, with the current estimated value at 40.7 percent.

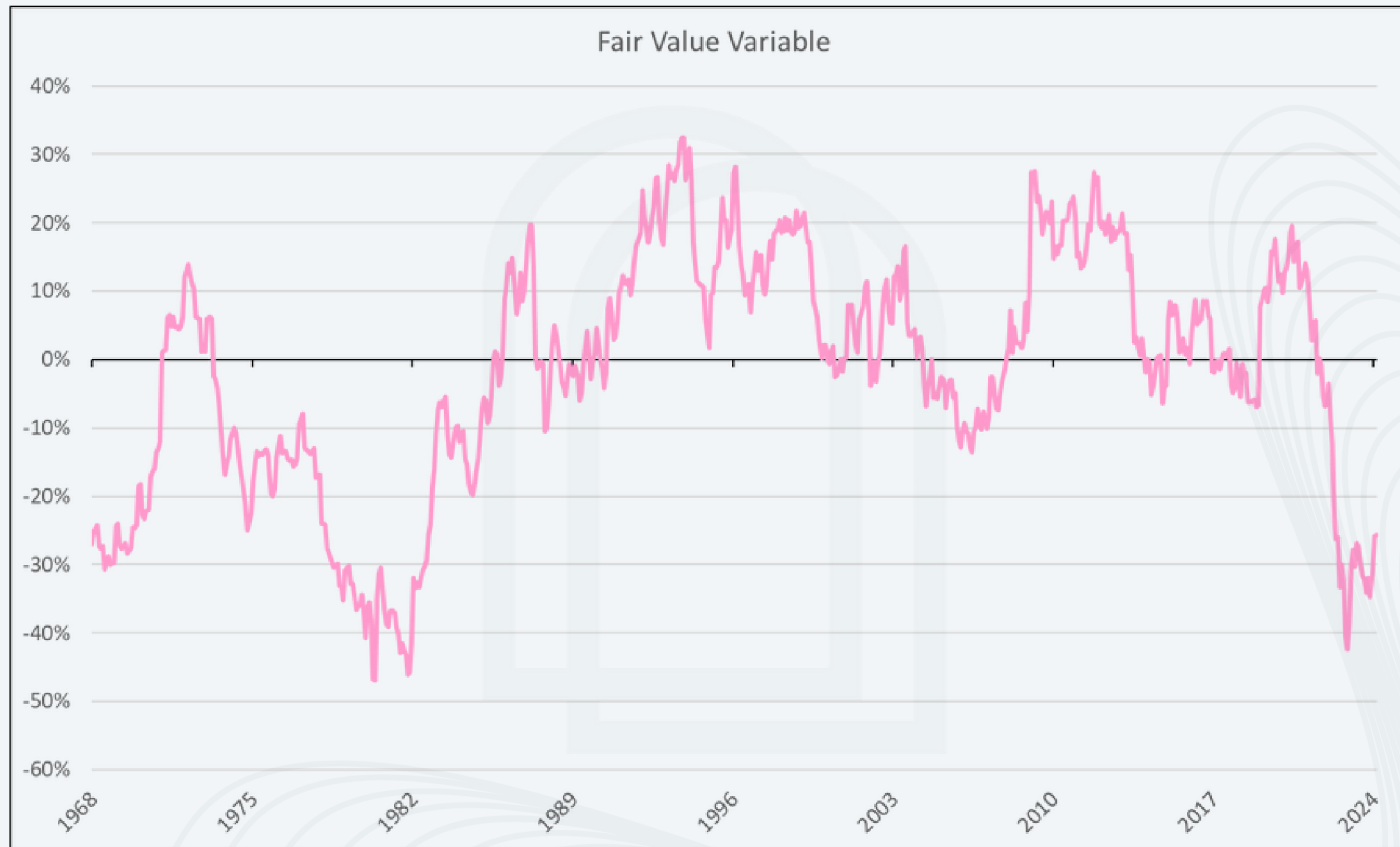


Source: Reef Insights LLC



Source: Reef Insights LLC

FAIR VALUE VARIABLE (FVV)



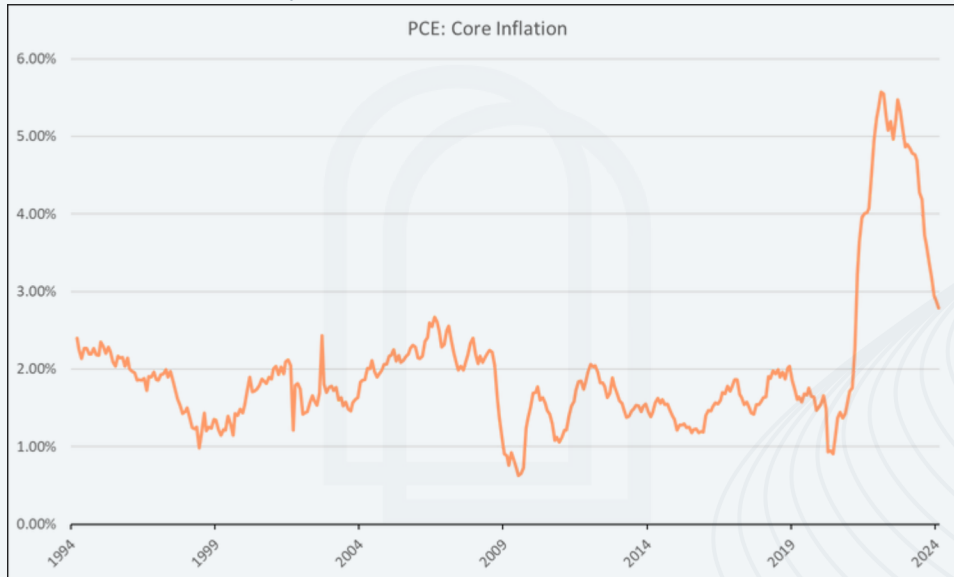
Source: Reef Insights LLC

We've developed a methodology involving three rolling averages for the percentage of median household income allocated to annual mortgage payments. These averages span 5 years, 10 years, and 15 years, respectively. By dividing each average by the prevailing percentage of median household income spent on annual mortgage payments, we derive a 'fair value' premium or discount for each period. These premiums or discounts are then averaged to determine a value that can be applied to the prevailing median sales price of houses sold. In February, we noted a month-over-month increase in the fair value variable, with the current estimated value standing at negative 25.7 percent.

PCE INFLATION



Source: U.S Bureau of Economic Analysis

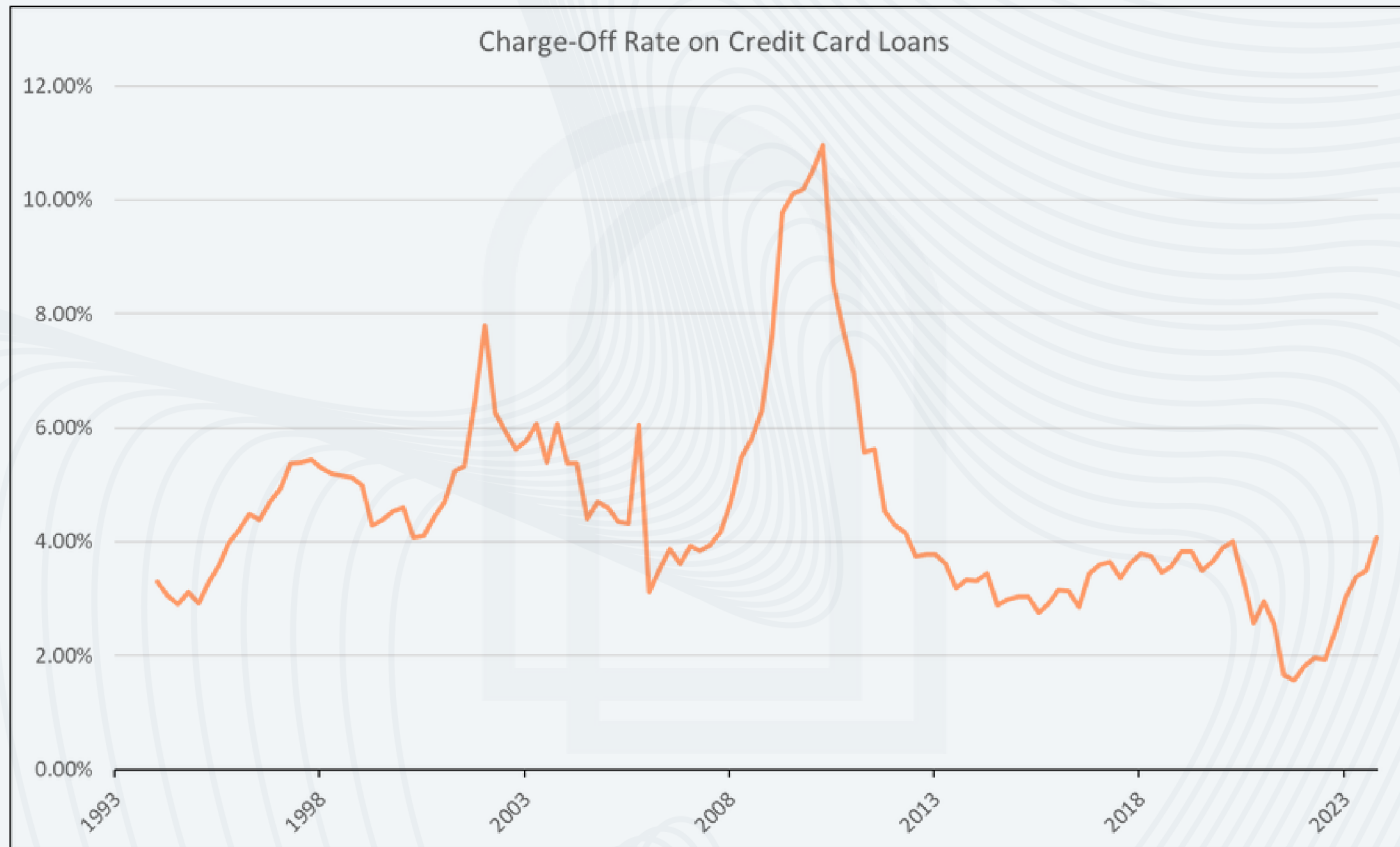


Source: U.S Bureau of Economic Analysis

Although Headline PCE Inflation is not the Federal Reserve's preferred metric for inflation targeting, this metric is important to understand how citizens are experiencing inflationary pressures. Year-over-year, Headline PCE Inflation was up 4.88 percent. Over the past few months, progress on reducing inflation has somewhat stalled, leading the FOMC to suggest that a rate cut would be further delayed.

The Core PCE Inflation metric holds significant weight as the Federal Reserve's preferred measure for inflation targeting. As of February, Core PCE Inflation stands at 2.78 percent. With the upcoming release of March figures, it's essential to highlight the pivotal role this metric, along with employment data, plays in shaping the Federal Reserve's decisions regarding the federal funds rate. These indicators serve as key factors influencing monetary policy, guiding the Federal Reserve's efforts to maintain economic stability and achieve its mandate of price stability and maximum employment.

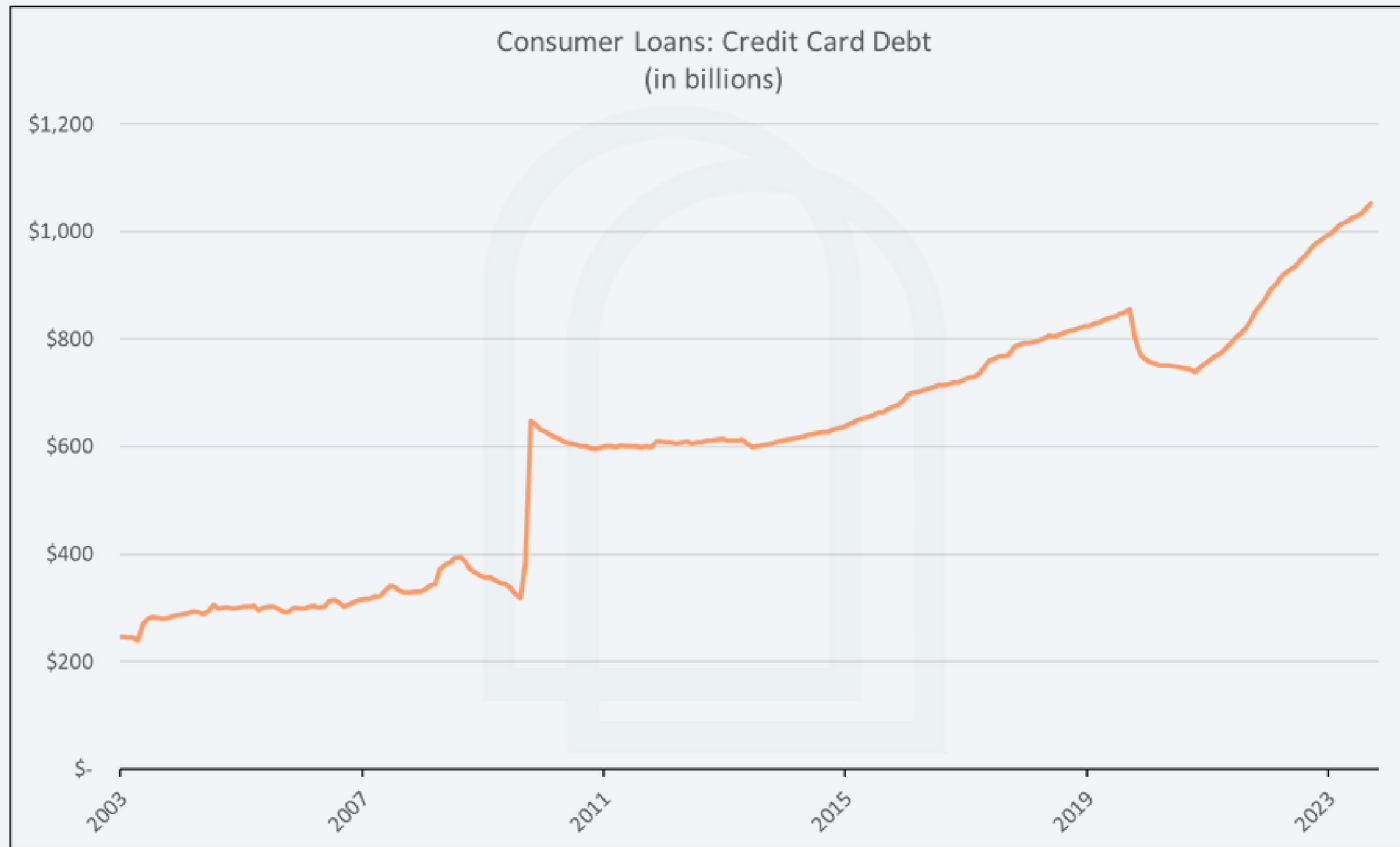
CHARGE-OFF RATE ON CREDIT CARD LOANS



Source: Board of Governors of the Federal Reserve System

Charge-offs, in the context of credit card loans, refer to the value of debt deemed uncollectible and subsequently written off as a loss. These rates are calculated on an annual basis, net of any recoveries. This quarter, there has been a notable increase in the charge-off rate for credit card loans, which rose to 4.07 percent in Q4 2023. When compared to the same period last year, the charge-off rate for credit card loans has increased by 68.18 percent.

CONSUMER LOANS: CREDIT CARD DEBT



Source: Board of Governors of the Federal Reserve System

Credit card debt experienced a rise on a monthly basis, with the outstanding balance reaching \$1.05 trillion in March. Compared to the same month last year, there's been an 8.67% increase in credit card debt. This trend highlights a significant uptick in consumer borrowing through credit cards.

UNEMPLOYMENT

The unemployment rate is one of the most reliable lagging economic indicators. The unemployment rate saw a decrease month-over-month, with an unemployment rate of 3.8 percent being reported in March. Year-over-year, the unemployment rate was up 8.57 percent.

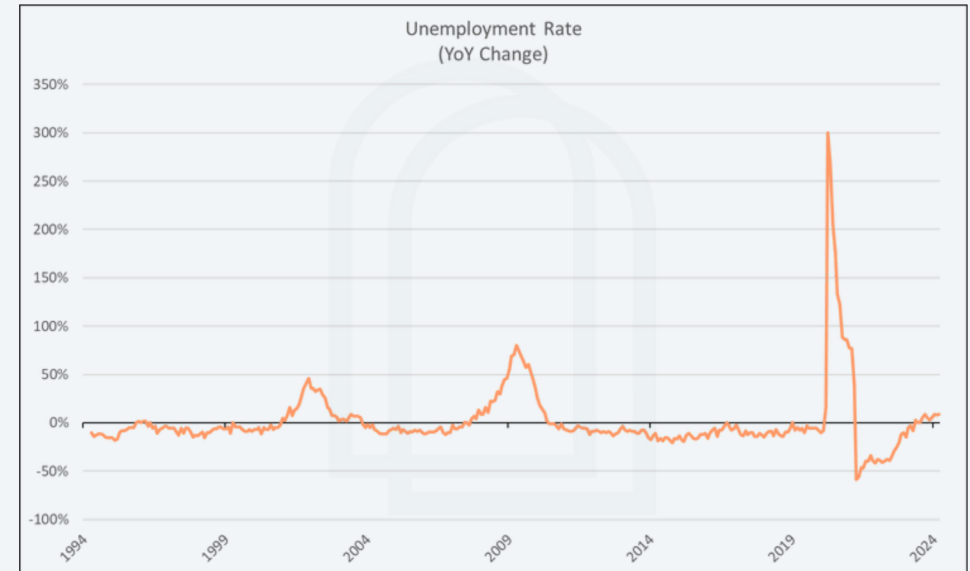
We wanted to include both the nominal and year-over-year charts to give you the full context of this metric. Looking at the nominal level of unemployment, it still remains very low. This level is not something to be terribly concerned about as it is lower than the historical average and is a sign that the economy is currently operating fairly well.

However, the point that we would like to draw your attention towards is the year-over-year chart, as it tells a different story. Looking back, we can see that typically the year-over-year value sits at or below the zero percent line; only in recessions does the value go above zero. Over the past couple of months, this figure has trended in a positive year-over-year direction.

This will be a metric to watch as layoff announcements continue to roll in and select sector performance slows.

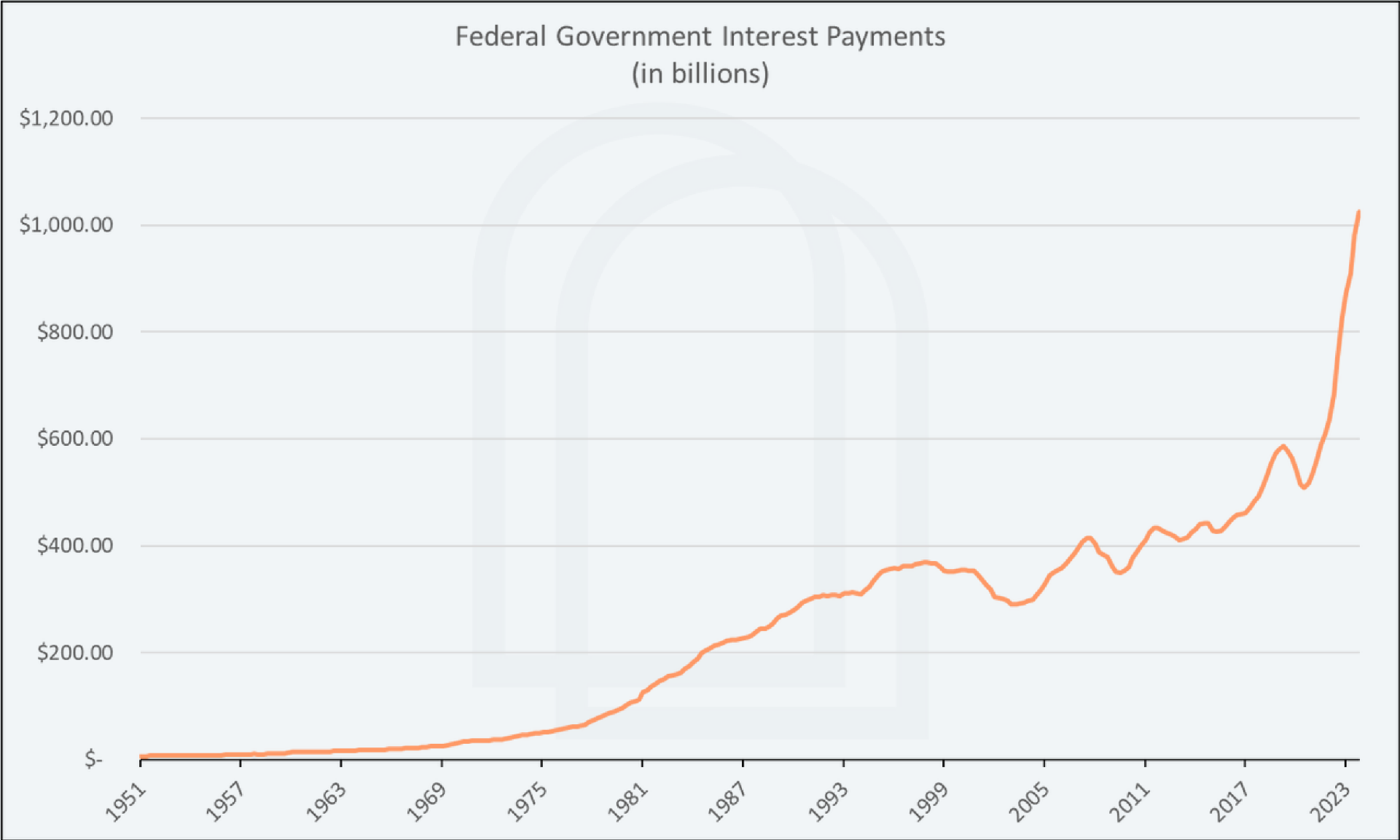


Source: U.S. Bureau of Labor Statistics



Source: U.S. Bureau of Labor Statistics

FEDERAL GOVERNMENT INTEREST PAYMENTS



Source: U.S. Bureau of Economic Analysis

FEDERAL GOVERNMENT INTEREST PAYMENTS

The current annualized interest payment expenditure of the Federal government stands at \$1.025 trillion, slightly surpassing the annualized defense expenditure of \$1.022 trillion. With interest rates remaining high, relative to the recent past, these expenditures are expected to continue increasing as deficit spending and lower-interest existing debt maturing persists.

According to projections from the Congressional Budget Office (CBO), interest costs are anticipated to surpass their previous peak, recorded in 1991, relative to the economy's size, reaching 3.2 percent of GDP by 2025.

The Federal government has not operated at a surplus since 2001. Furthermore, since 2019, it has maintained a deficit of 5 percent or more as a percentage of GDP.

The federal government interest payments saw an increase quarter-over-quarter, with a value of \$1.025 trillion being reported in Q4 2023. Year-over-year, the total federal government interest payments were up 23.65 percent.

U.S. TREASURY SECURITIES ISSUANCE



Source: SIFMA Research

U.S. TREASURY SECURITIES ISSUANCE

In March 2024, there were over \$2.0 trillion in U.S. Treasury securities issued. In 2023, there were \$22.7 trillion issued, which is more than what was issued in 2020. March issuances were at a lower level than what was issued in February 2024, over \$2.5 trillion, however at the run rate of the first quarter, \$7.2 trillion, that would put the U.S. on a \$28.8 trillion issuance run rate for the year, a 26.9 percent year-over-year increase.

The U.S. Department of the Treasury issues debt securities to finance government spending activities. Known as Treasuries, these securities are considered virtually risk-free, backed by the U.S. government's taxing power.

There are four main types of Treasury securities:

1. Treasury Bills (T-Bills): Short-term securities with maturities of one year or less.
2. Treasury Notes (T-Notes): Medium-term securities with maturities ranging from two to 10 years.
3. Treasury Bonds (T-Bonds): Long-term securities with maturities of 20 or 30 years, paying semiannual interest.
4. Treasury Inflation-Protected Securities (TIPS): Securities that provide inflation protection with varying maturities.

Currently, the vast majority of issuances are T-Bills, accounting for \$1.9 trillion of the March issuances, while a smaller portion is being issued in T-Notes, and an even smaller portion is being issued in T-Bonds and TIPS. TIPS are typically a small portion of issuances, however, the mix between Bills, Notes, and Bonds is important to pay attention to as rates fluctuate to understand the debt service costs associated. As looked at in the last section, as rates rise and debt rolls over, we have seen the interest payments on the federal government's debt climb above the \$1 trillion mark.

FEDERAL FUNDS RATE EXPECTATIONS

Market Expectations for Federal Funds Rate				
Meeting Date	475 - 500 bps	500 - 525 bps	525 - 550 bps	550 - 575 bps
5/1/2024	0.0%	0.0%	98.4%	1.6%
6/12/2024	0.0%	18.9%	79.8%	1.3%
7/31/2024	5.7%	37.1%	56.3%	0.9%
9/18/2024	19.8%	45.7%	31.4%	0.5%
11/7/2024	26.4%	42.1%	23.5%	0.4%
12/18/2024	33.6%	33.6%	13.0%	0.2%

Source: CME Fed Watch Tool

Throughout the year, market expectations have changed for the federal funds rate, which is currently set at 525 to 550 bps. As inflation figures have remained persistent, many FOMC members, including Jerome Powell, have suggested that rates will continue to remain elevated.

Above, you'll see a break-down for how the market expects rates to change throughout 2024, as of April 18.

In our January REEF Report, we forecasted that rates would remain unchanged in Q1. In our March REEF Report, we extended our forecast to include Q2.

The federal funds rate impacts everything that is tied to interest rates, such as credit card rates, mortgage rates, and business lending facilities.

DATA TABLE

Metric	This Period	Last Period	Year Ago	Latest Release
Housing Starts: Total Units	1,321	1,549	1,380	3/1/2024
New Housing Supply	8.40	8.30	8.40	2/1/2024
Existing Housing Supply	3.20	2.90	2.70	3/1/2024
Nominal Median Sales Price of Houses Sold	\$ 417,700	\$ 435,400	\$ 479,500	10/1/2023
New Building Permit Authorizations: Total Units	1,458	1,523	1,437	3/1/2024
Case-Shiller Index	310.46	310.76	292.81	1/1/2024
Residential Construction Employees	941	936	926	3/1/2024
Nominal Mortgage Rates	6.79	6.94	6.32	4/1/2024
Delinquency Rates: Single-Family	1.69	1.72	1.78	10/1/2023
Delinquency Rates: Commercial	1.17	1.06	0.64	10/1/2023
PPI: Residential Construction	317	316	305	3/1/2024
Construction Spending: Residential	\$ 913	\$ 906	\$ 857	2/1/2024
Housing Inventory: Median Days on Market	50	61	46	3/1/2024
Nominal Monthly Mortgage Payment	\$ 2,176	\$ 2,210	\$ 2,077	4/1/2024
Real Mortgage Payment Index	6.97	6.95	6.92	2/1/2024
Median Household Income Spent on Annual Mortgage Payments	34.45	34.37	33.57	2/1/2024
Fair Value Variable	(25.70)	(25.89)	(27.84)	2/1/2024

DATA TABLE

Metric	This Period	Last Period	Year Ago	Latest Release
Housing Expense Change	40.75	40.92	41.57	2/1/2024
Nominal Median Household Income	\$ 74,580	\$ 70,780	\$ 70,780	2022
Headline Inflation	3.48	3.17	4.94	3/1/2024
Core Inflation	3.80	3.76	5.56	3/1/2024
Unemployment Rate	3.80	3.90	3.50	3/1/2024
Federal Funds Rate	5.33	5.33	4.65	3/1/2024
Personal Savings Rate	3.60	4.10	4.70	2/1/2024
Jobless Claims	212,000	212,000	224,000	4/13/2024
10-Year U.S. Treasury Yield Minus 2-Year U.S. Treasury	(0.34)	(0.26)	(0.50)	4/1/2024
Residential Rental Vacancy Rate	6.60	6.60	5.80	10/1/2023
Real Residential Construction Spend Index	105.74	106.31	100.84	2/1/2024
Household Savings	\$ 807	\$ 2,207	\$ 2,207	2022
Bank Credit: All Commercial Banks	\$ 17,513	\$ 17,550	\$ 17,314	4/10/2024
Delinquency Rates: Credit Card	3.10	2.97	2.27	10/1/2023
Gross Domestic Product (GDP)	\$ 27,957	\$ 27,610	\$ 26,408	10/1/2023
M2 (Money Supply)	\$ 20,784	\$ 20,790	\$ 21,135	2/1/2024
Federal Reserve's Balance Sheet	\$ 7,406	\$ 7,438	\$ 8,593	4/17/2024

DATA TABLE

Metric	This Period	Last Period	Year Ago	Latest Release
PCE: Headline Inflation	4.88	4.47	7.63	2/1/2024
PCE: Core Inflation	2.78	2.88	4.84	2/1/2024
Debt-to-GDP	121.62	120.13	118.98	10/1/2023
Real GDP	\$ 22,679	\$ 22,491	\$ 21,990	10/1/2023
Trucking Employees	1,559	1,554	1,578	3/1/2024
Industrial Production	103	102	103	3/1/2024
Credit Card Interest Rates	21.59	21.47	20.09	2/1/2024
Charge-Off Rate: Credit Card Loans	4.07	3.49	2.42	10/1/2023
Charge-Off Rate: Business Loans	0.40	0.40	0.23	10/1/2023
Charge-Off Rate: Commercial Real Estate Loans	0.24	0.13	0.03	10/1/2023
Yield Curve	(0.34)	(0.26)	(0.79)	3/1/2024
Total Assets: Money Market Funds	\$ 6,357,551	\$ 6,142,962	\$ 5,223,061	10/1/2023
Federal Government Interest Payments	\$ 1,026	\$ 981	\$ 830	10/1/2023
CPI: Rent in U.S. City Average	415	414	393	3/1/2024
Consumer Loans: Credit Card Debt	\$ 1,053	\$ 1,045	\$ 969	3/1/2024

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.

ABOUT

Shane McIntosh

holds a double major in Finance and Supply Chain Management from the Carlson School of Management at the University of Minnesota. Shane also manages private capital across a variety of markets and asset classes.

Jake Enos

holds a major in Finance and a minor in Accounting from the Carlson School of Management at the University of Minnesota. Jake also runs syndication investments in real estate in the Midwest.

We currently produce three reports:

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

Our monthly and quarterly reports will contain similar information, but the duration of our forecasts, as well as the focus, will differ depending on the report. Monthly reports place an emphasis on short-term estimates, whereas our quarterly reports will seek to forecast on a quarter-to-quarter basis.

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.

If you'd like to review past forecasts, additional content, or subscribe to our newsletter, you can do all of these things through our website, reefinsights.com

DISCLAIMER

Disclaimer for Reef Insights LLC

Effective Date: January 7, 2024

The information provided by Reef Insights LLC ("Reef Insights", "we", "us", or "our") on our website, through our reports, newsletters, and other publications, is for general informational and educational purposes only. All information on the site is provided in good faith, however, we make no representation or warranty of any kind, express or implied, regarding the accuracy, adequacy, validity, reliability, availability, or completeness of any information on the site.

Forward-Looking Statements

Some of the information provided by Reef Insights may contain projections or other forward-looking statements regarding future events or the future financial performance of markets. We wish to caution you that these statements are only predictions and that actual events or results may differ materially. These forward-looking statements are subject to numerous risks and uncertainties, many of which are beyond our control.

Not Financial Advice

The content provided by Reef Insights is not intended to be and does not constitute financial advice, investment advice, trading advice, or any other advice. The content is for informational and educational purposes only and should not be construed as a recommendation to invest, trade, or engage in any specific financial strategy. We are not registered investment advisors, brokers, or dealers. Nothing we say, write, or publish should be taken as financial advice. Our content should not be relied upon for making investment or financial decisions.

No Client Relationship

Your use of our website or services does not create a client, advisory, fiduciary, or professional relationship between you and Reef Insights.

Responsibility for Decisions

Any use or reliance on our content is solely at your own risk and discretion. You should conduct your own research, review, analysis, and verify our content before relying on them. Making financial and investment decisions based on any information presented by us is not advisable and done at your own risk.

Limitation of Liability

In no event shall Reef Insights LLC, nor its directors, employees, partners, agents, suppliers, or affiliates, be liable for any indirect, incidental, special, consequential, or punitive damages, including without limitation, loss of profits, data, use, goodwill, or other intangible losses, resulting from (i) your access to or use of or inability to access or use the service; (ii) any conduct or content of any third party on the service; (iii) any content obtained from the service; and (iv) unauthorized access, use, or alteration of your transmissions or content, whether based on warranty, contract, tort (including negligence), or any other legal theory, whether or not we have been informed of the possibility of such damage.

Changes to Disclaimer

We reserve the right to update or change our Disclaimer at any time. Your continued use of our service after we post any modifications to the Disclaimer on this page will constitute your acknowledgment of the modifications and your consent to abide and be bound by the modified Disclaimer.

Contact Us

If you have any questions about this Disclaimer, please contact us at legal@reefinsights.com