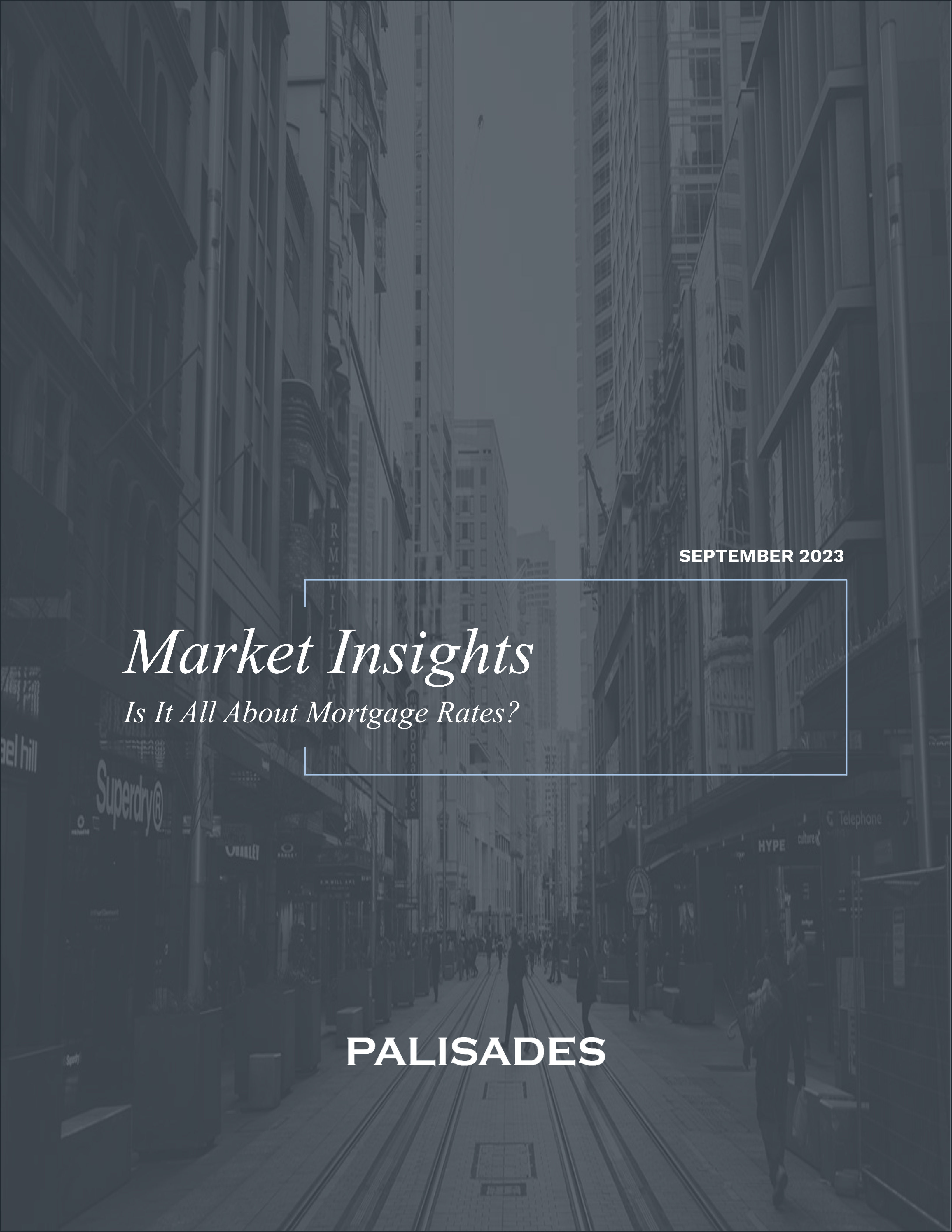


SEPTEMBER 2023

Market Insights

Is It All About Mortgage Rates?

PALISADES

PSYCHOLOGY OF HOUSING DEMAND

As the Fed was raising interest rates during 2022-2023, the market's focus was on the potential demand destruction that may ensue alongside elevated financing costs. While demand has been curtailed due to affordability pressure, we have witnessed human psychology emerge as a force that in many ways contradicts conventional wisdom.

Housing demand is not simply driven by changes in affordability levels and, as with most human endeavors, logic, data, and math do not always tell the entire story. Housing demand can be influenced by psychological and emotional factors. Examples of this include the following:

- **When we see our friends, family, and peers buy homes, it has the tendency to make us want to buy a home.**
- **When we see others generating wealth through homeownership, it makes us want to be homeowners and create wealth for ourselves.**
- **When we see our friend's children playing in a nice backyard in a quiet neighborhood, it makes us want to own a single-family house with a backyard of our own.**

While psychological and emotional factors are not easily seen in the data, they nonetheless impact housing demand alongside observable metrics like interest rates.

MORTGAGE INTEREST RATES

Our team has spent a lot of time thinking about scenario analyses and trying to answer the following questions:

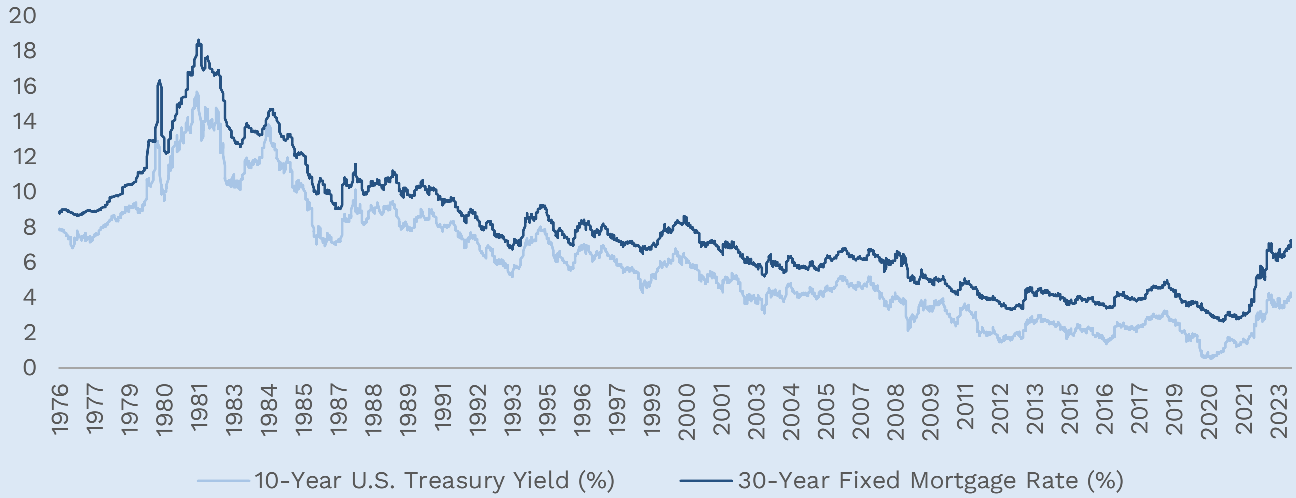
- **What is the "natural" level of mortgage rates in today's environment?**
- **What does this tell us about the likely future path of mortgage rates?**
- **How may pent-up purchase demand and the 'deferred sales impulse' influence supply-demand parity in different rate environments?**

"NATURAL" LEVEL OF MORTGAGE RATES

Historically, the 30-year fixed mortgage rate has been highly correlated to the 10-year U.S. Treasury yield. The Freddie Mac Primary Mortgage Market Survey (PMMS) is a weekly survey that dates to the 1970s, and we can sync it up with weekly U.S. Treasury yields dating back to 1976, representing 2,465 weekly data points.

30-Year Fixed Mortgage Rate and 10-Year U.S. Treasury Yield

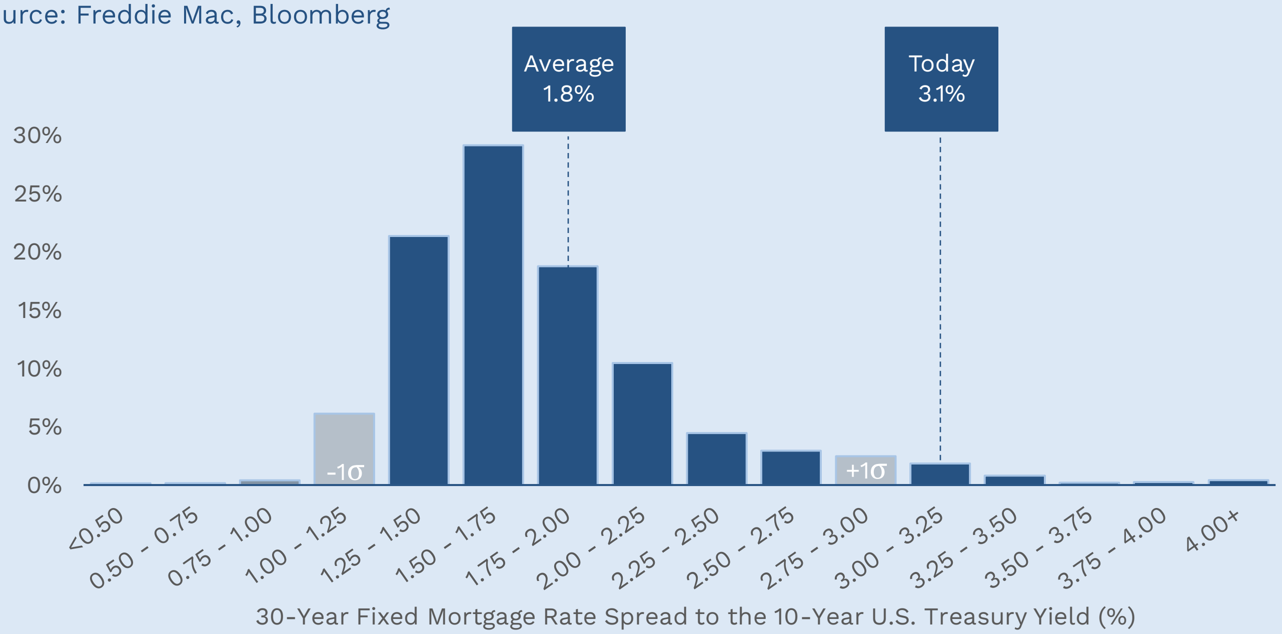
%, June 1976 through August 2023
Source: Freddie Mac, Bloomberg



The correlation between the 30-year fixed mortgage rate and 10-year U.S. Treasury yield during the last 47 years has been 98.9%. During that period, the average spread between these two measurements has been 1.8% ("**mortgage spread**"). The mortgage spread distribution is depicted in the histogram below.

30-Year Fixed Mortgage Rate Spread to the 10-Year U.S. Treasury Yield (Histogram)*

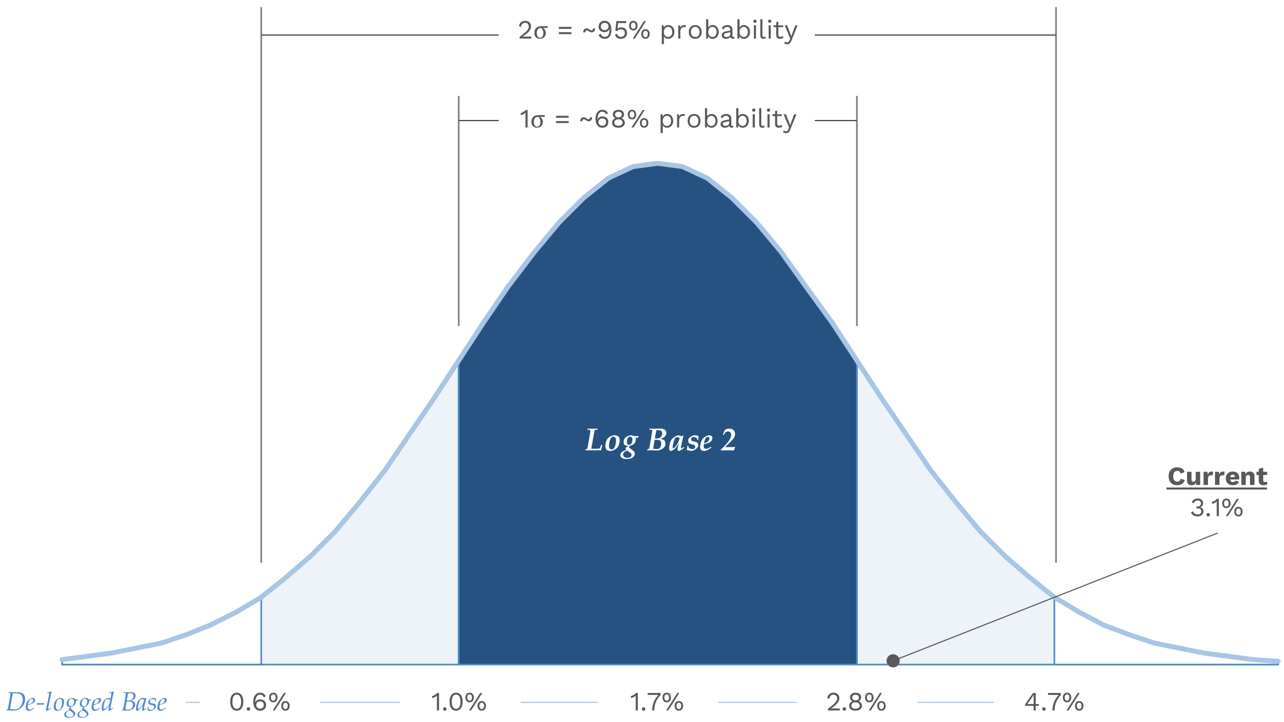
Observations: 2,465 weekly observations
Source: Freddie Mac, Bloomberg



* Standard deviations depicted on chart were transformed using *log base 2* method.

As the chart on the previous page shows, the mortgage spread dataset is not normally distributed and tends to have fat right tails. Transforming the data using *log base 2* allows us to obtain an approximation of the probability bands for the mortgage spread. The results of the transformation and de-logging show:

- **~68% probability** the mortgage spread is between **+1.0% and +2.8%**
- **~95% probability** the mortgage spread is between **+0.6% and +4.7%**
- **The current mortgage spread is +3.1%**, which has **less than a 12% probability of occurrence**



30-Year Fixed Mortgage Rate Spread to 10-Year U.S. Treasury Yield

There have been only 63 weeks (over the last 2,465) where the mortgage spread exceeded 3.1%, or less than 2.6% of the time. Today, logic would suggest the mortgage spread is more likely to contract rather than widen, which implies that the "natural" rate for the 30-year fixed mortgage rate is below today's actual prevailing interest rate.

Since February 18, 2022, shortly before the onset of the recent Fed tightening, the mortgage spread surpassed the historical average of 1.8%, and has remained well above that level ever since, as uncertainty regarding inflation and the path of rates has elevated market volatility.

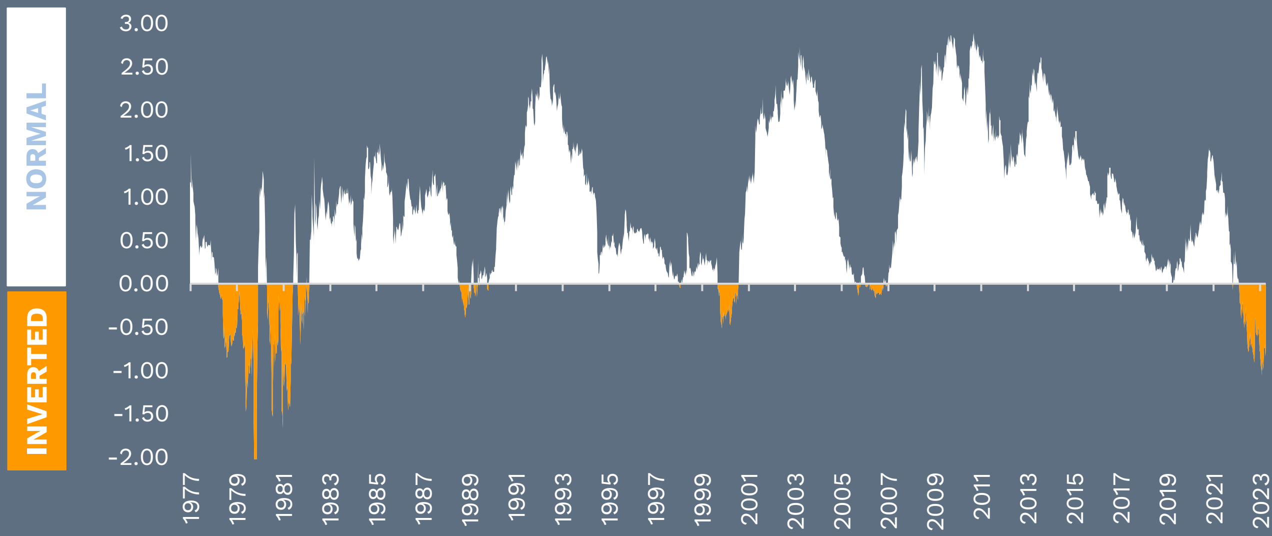
THE "NATURAL" MORTGAGE RATE

Using historical data, we can develop a simple formula for projecting the "natural" rate for the 30-year fixed mortgage. The following formula minimizes the variance between the estimated mortgage rate and the actual observed mortgage rate during periods when the **yield curve is upward sloping**.

$$\underset{\text{[upward sloping yield curve]}}{\textbf{"Natural" 30-Year Mortgage Rate}} = \left[0.04 * \text{2-Year Treasury Yield} \right] + \left[0.96 * \text{10-Year Treasury Yield} \right] + 1.77$$

The formula is applicable in most market environments, however, in 377 weekly readings dating back to 1976, or 15.3% over that period, the U.S. yield curve has been inverted as measured by the difference between the 10-year and 2-year U.S. Treasury yields.

10-Year & 2-Year U.S. Treasury Yield Differential
%, June 1976 through August 2023
Source: Bloomberg



To optimize the fit for the "natural" rate, we can distinguish between periods when the yield curve is upward sloping and periods when there is an inversion. In periods of yield curve inversion, the formula is modified as follows:

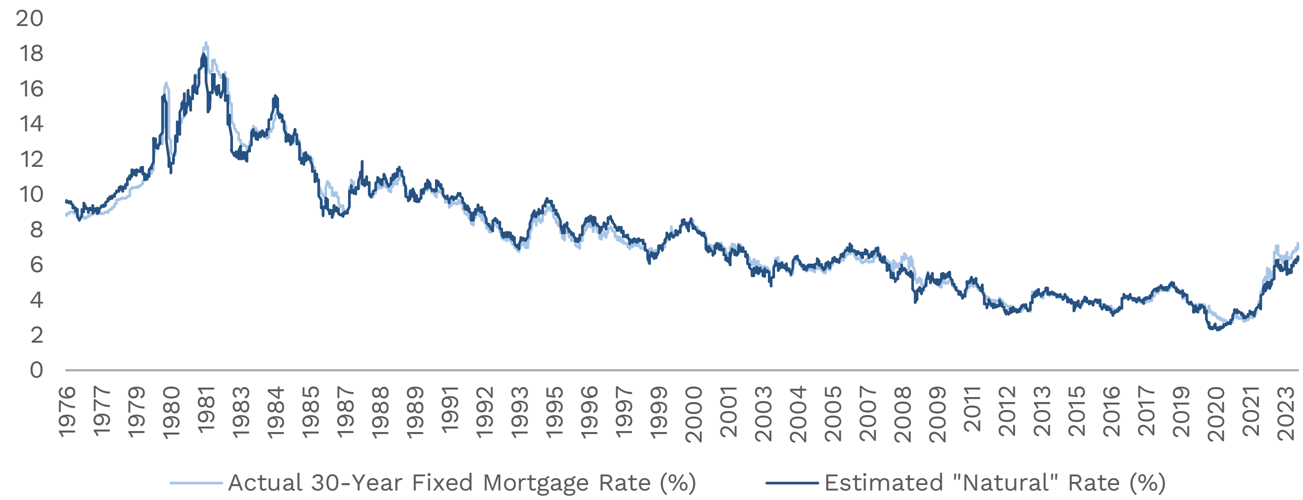
$$\underset{\text{[inverted yield curve]}}{\textbf{"Natural" 30-Year Mortgage Rate}} = \left[0.35 * \text{2-Year Treasury Yield} \right] + \left[0.65 * \text{10-Year Treasury Yield} \right] + 1.92$$

These basic formulas produce an estimate for the **“natural”** 30-year fixed mortgage rate that we can backtest and fit with actual historical rates. **The average variance between the <u>estimated</u> “natural” rate and <u>actual</u> historical rates is zero**.

“Natural” Rate versus Actual 30-Year Fixed Mortgage Rate

%, June 1976 through August 2023

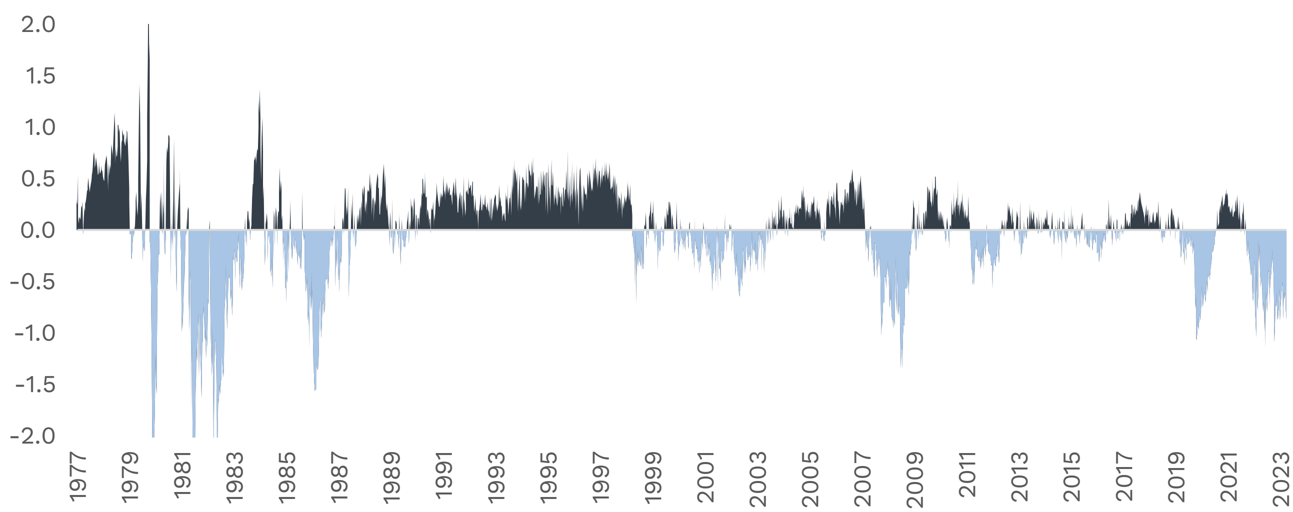
Source: Freddie Mac, Bloomberg, Palisades



The projected “natural” rate has a minimum and maximum variance of -388 and +252 basis points, respectively, relative to the actual observed fixed mortgage rate as seen in the chart below.

“Natural” Rate variance to Actual 30-Year Fixed Mortgage Rate(%)

Source: Freddie Mac, Bloomberg, Palisades

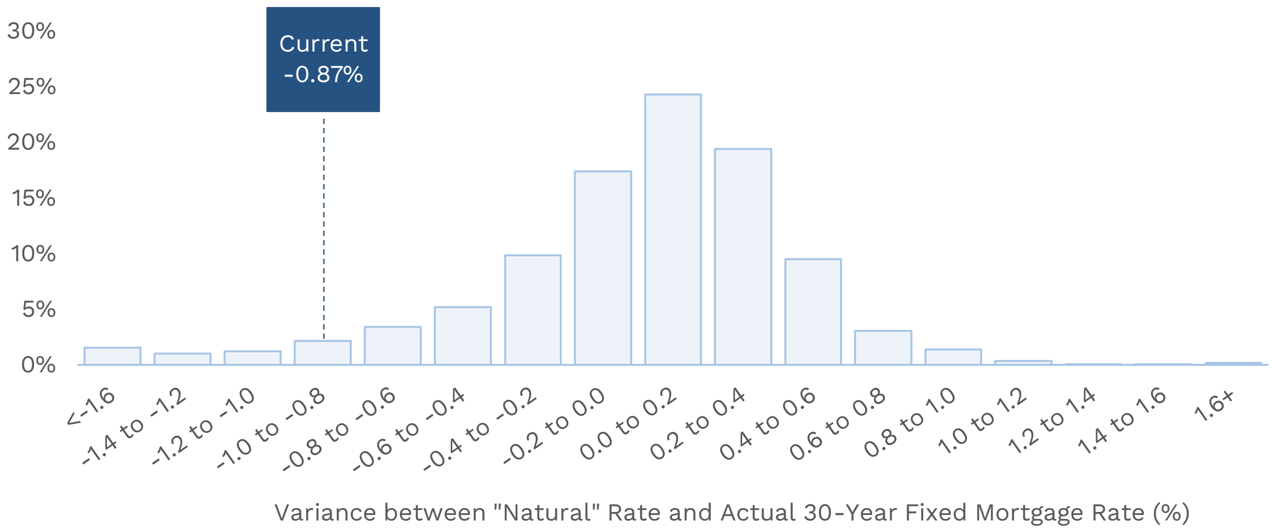


The formulas estimate the current "natural" rate to be **6.31%** based on a 10-year and 2-year U.S. Treasury yield of 4.11% and 4.86%, respectively, as of August 31, 2023. **This "natural" rate is 87 basis points below the actual Freddie Mac PMMS 30-year fixed mortgage rate of 7.18%.** As the histogram below illustrates, rarely is the variance so large. In fact, 88.4% of the time the "natural" rate is no less than 50 basis points below the actual rate observed in the market.

Variance between "Natural" Rate and Actual 30-Year Fixed Mortgage Rate (Histogram)

%, June 1976 through August 2023

Source: Freddie Mac, Bloomberg, Palisades



As the data shows, we are in unique times with many relationships pushing through historical boundaries. With the mortgage spread at 3.1%, the actual observed 30-year fixed mortgage rate is 87 basis points above the "natural" rate. As such, it is reasonable to anticipate this variance to normalize over time. There are two ways the mortgage spread may narrow and bring actual rates in line with the "natural" rate:

1. *U.S. Treasury Yields Rise*: all things being equal, if U.S. Treasury yields rise from current levels (and actual rates remain the same) this would increase the estimated "natural" rate and narrow the gap between the actual and "natural" rates of interest.

2. *Actual Mortgage Rates Decline*: all things being equal, if actual mortgage rates decline due to a narrowing of the mortgage spread (with U.S. Treasury yields remaining constant), this too would reduce the gap between the actual and "natural" rates of interest.

MORTGAGE RATE IMPLICATIONS FOR HOUSING SUPPLY & DEMAND

The mortgage interest rate outlook has implications for supply, demand, new construction, affordability, and home values. Much of this has to do with simple mathematics, while some inevitably will bring psychological and emotional factors into play. We have analyzed four (4) possible interest rate scenarios:

1. *Rates Stay the Same*
2. *Rates Increase from Here*
3. *Rates Normalize to +/- "Natural" Rate*
4. *Rates Decline beyond "Natural" Rate*

"The number of single-family homes available for sale not only continues to fall, but the pace is accelerating. The 13%Y decrease in inventory is the sharpest drop since June 2021, with the contraction coming through both new and existing listings.

Tight supply should continue to provide support to home prices even as affordability has become more challenged… We expect affordability pressures to have a bigger impact on sales volumes than prices. "

Morgan Stanley

U.S. Housing Tracker, September 6, 2023

MORTGAGE INTEREST RATE SCENARIO

Increase from Here	8.0%+	▪ Lack of affordability forces more would-be homebuyers into the rental market. ▪ Housing transaction activity falls precipitously as both supply and demand further contract. ▪ Existing home inventory remains locked and low – '**deferred sales impulse**' grows. ▪ **Builder confidence declines,** reducing new construction and supply. ▪ Home values remain stable to **downward** sloping.
Stay the Same	7.0% - 7.5%	▪ Desire for homeownership continues with buyers adjusting housing cost expectations. ▪ Homeowners with low mortgage rates have a material rate disincentive to sell. ▪ Existing home inventory remains locked and low – '**deferred sales impulse**' grows. ▪ **Builder confidence remains cautious but constructive** given the supply-demand imbalance. ▪ New home construction continues to represent a disproportionate share of housing transactions. ▪ Home values remain stable and **upward** sloping.
Normalize to +/- Natural Rate	6.2% - 6.8%	▪ Pent-up demand is released as housing affordability improves. ▪ Homeowners with low mortgage rates continue to have rate disincentive to sell. ▪ Existing home inventory remains low, with **a moderate increase in deferred sales activity**. ▪ **Builder confidence improves** as affordability eases and supply-demand imbalance persists. ▪ New home construction increases and continues to be a disproportionate share of housing activity. ▪ Home values rise which puts incremental **pressure on headline inflation metrics**.
Decline beyond Natural Rate	<6.0%	▪ **Supply increases markedly** with **pent-up deferred sales activity** creating new listings. ▪ Pent-up demand is released from both new and existing homeowners. ▪ **Builder confidence is high** given improved affordability – new homes add to supply. ▪ Existing and new home inventory normalizes to historical levels (~85% and ~15%, respectively). ▪ **Deluge of supply** puts pressure on home values in markets with **lower demand**. ▪ **Increase in demand** supports home values in markets with **lower supply**.

PORTFOLIO POSITIONING FOR UNKNOWN RATE ENVIRONMENT

The private residential credit sector is an estimated $4 trillion market, which is a subset of the broader $13.4 trillion U.S. mortgage universe. Within the private residential credit sector there are a multitude of product types with varying degrees of risk, return, and duration profiles. **The market offers everything from distressed loans to high quality performing credit products, as well as short duration construction loans and long duration 30-year consumer loans**.

This variety and scale offers investors numerous portfolio construction options tailored to their specific risk tolerances and return objectives. At any point in time, housing market conditions play a significant role in determining the opportunity set across the spectrum of residential credit products.

The U.S. originated $10.5 trillion of loans from late 2019 to early 2022, with average interest rates of approximately 3.5%. As a result, consumers are not rushing to sell homes only to lose their low-rate mortgages. We can see the impact on supply-demand dynamics in headline metrics such as existing home inventory, which is 50%+ below the historical average, and supply-demand parity indicators such as months' supply of existing homes, days on market, owner occupied vacancy rates, and months to sale since completion of new homes, all of which are at or near historically low levels.

All metrics indicate an overwhelmingly undersupplied housing market relative to today's demand.

As credit investors, there is a desire to finance things that are in high demand and/or low supply. Property markets across the U.S. are undersupplied, and, therefore, providing short duration, high yielding (10%+ asset yield) **construction loans to builders is attractive for multiple reasons**:

- **The tailwinds in the undersupplied housing market support the construction loan thesis.**

- **The operational complexity component to residential construction loans limits competition and price risk, providing investors with a yield premium relative to other sectors.**

- **The dispersion of economic outcomes over the next 12 to 24 months is wide, and maintaining an allocation to high-yielding short duration loans provides the flexibility to pivot into opportunities as conditions develop.**

There are other private residential credit opportunities besides construction loans that are borne out of the current market conditions. Most investors like to buy assets at discounts and, historically, investors could access distressed residential loans at a discount to a loan's contractual debt. Today, investors can purchase high quality performing loans at a discount targeting 8.5% to 9.5%+ asset yields, with land and building structures as tangible collateral.

All of this ties back to the $10.5 trillion of loans with 3.5% average interest rates. These loans trade in the secondary market for a variety of reasons, and, due to the current rate environment, investors can acquire them at 15% to 30% discounts. Not only does this create a large margin of safety between the purchase price of the loans and the underlying property value, but it also creates a path toward outperformance through active asset management strategies focused on accelerating the recovery of the purchase price discount.

While the dispersion of outcomes is wide, the probability-weighted outlook today is arguably better than those faced circa 2021 when rates were low, credit spreads were tight, and prices were high. Unlike the 2020-2021 period, we believe that the distribution of returns in many residential credit products is positively skewed in favor of the investor in today's environment.

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